NBER WORKING PAPER SERIES

ACROSS-COUNTRY WAGE COMPRESSION IN MULTINATIONALS

Jonas Hjort
Xuan Li
Heather Sarsons

Working Paper 26788
http://www.nber.org/papers/w26788

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
February 2020

We are grateful to David Card for early encouragement and to Alex Mas for suggestions that significantly improved the paper. We also thank Oriana Bandiera, Sandy Black, Nick Bloom, Jeff Clemens, Arindrajit Dube, Alex Frankel, Francois Gerard, Gordon Hanson, Simon Jäger, Emir Kamenica, Alan Krueger, Attila Lindner, W. Bentley MacLeod, Hannes Malmberg, Enrico Moretti, Suresh Naidu, John Van Reenen, Jonah Rockoff, David Silver, Catherine Thomas, Felix Tintelnot, and Eric Verhoogen for helpful advice and comments; Madhunika Iyer, Nidhaanjit Jain, and Jett Pettus for great research assistance; the Company for data access and many helpful conversations; and seminar audiences at the AEA Annual Meeting, NBER Summer Institute, Berkeley Haas, Brown, Columbia, LSE, NYU, UCLA, UCL, Uppsala, UCSD, and the briq Workshop on Firms, Jobs and Inequality for great feedback. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

Across-Country Wage Compression in Multinationals
Jonas Hjort, Xuan Li, and Heather Sarsons
NBER Working Paper No. 26788
February 2020
JEL No. F23,J01,J3,J31

ABSTRACT

Many employers link wages at the firm's establishments outside of the home region to the level at headquarters. Multinationals that anchor-to-the headquarters also transmit wage changes arising from shocks to minimum wages and exchange rates in the home country/state to their foreign establishments. Such multinationals fire more low-skill workers and hire fewer new workers abroad after a permanent (minimum wage-induced) foreign establishment wage increase originating in shocks to headquarter wages, but not after a temporary (exchange rate-induced) one. We show this using data on 1,060 multinationals' establishments across the world and in employee-level data on the same employers' establishments in Brazil.

Jonas Hjort
Graduate School of Business
Columbia University
3022 Broadway, Uris Hall 622
New York, NY 10027
and NBER
hjort@columbia.edu

Heather Sarsons
Booth School of Business
University of Chicago
Chicago, IL
and NBER
heather.sarsons@chicagobooth.edu

Xuan Li
LSK 6042, Department of Economics
Hong Kong University of Science and Technology
Clear Water Bay, Kowloon
Hong Kong
xuanli@ust.hk

1 Introduction

Research in economics has traditionally assumed that labor markets are competitive. In competitive labor markets, firms adjust so that workers' pay equals the value of their marginal product. When some firms pay more than others for workers of similar skill levels—most famously, perhaps, multinationals abroad (Brown *et al.* , 2004; Martins & Esteves, 2015; Card *et al.* , 2013, 2015; Barth *et al.* , 2016; Bloom *et al.* , 2018; Card *et al.* , 2018; Alfaro-Urena *et al.* , 2019), this has been attributed to technologies or production styles.[1] However, there is growing evidence that some multi-establishment firms are unable or unwilling to adjust to the different contexts they operate in[2], and many high-wage firms are headquartered in a high-wage region (Setzler & Tintelnot, 2019).

In this paper we investigate a previously undocumented source of firm wage premiums. We hypothesize that the use of firm-wide wage-setting procedures limits wage differences within firms, pulling the wages paid at establishments in other regions toward the level at headquarters. Using job-level data on multinationals, we find strong evidence that many firms indeed "anchor" the wages they pay abroad to wages at headquarters. Such firms extend externally imposed headquarter wage increases to their foreign establishments, pointing to a direct link between wages at home and abroad. We examine the implications for employment outside of the home country and find evidence that firms that anchor wages lay off more low-skill workers and hire fewer new workers in their foreign establishments after an exogenous wage increase at the headquarters.

We rely on two main datasets for our analysis. To document wage anchoring, we use an unusual 2005-2015 dataset of yearly average wages by narrowly-defined occupation in multinationals' establishments across the world. This dataset was constructed by a consulting company whose expertise is to harmonize occupations or "jobs" by their tasks and responsibilities to provide employers with aggregated information about prevailing wages. The dataset covers 1,060 multinationals that span 16 broad sectors and operate in 170 different capital cities around the world. Most of the employers in the dataset are well-known for-profit firms—the publicly listed U.S. firms in our data account for about one-third of the total revenue of all publicly listed U.S. firms (see Section 2)—but the dataset

[1] Recognition of and interest in "firm effects" in wages have a long history in labor economics. For early work, see e.g. Slichter (1950); Rees & Schultz (1970); Dickens & Katz (1987); Krueger & Summers (1988); Van Reenen (1996); Abowd *et al.* (1999, 2002). That multinationals pay workers more than local firms is extensively documented (see Brown *et al.* (2004); Lipsey (2004); Lipsey & Sjoholm (2006); Martins & Esteves (2015); Hijzen *et al.* (2013); Orefice *et al.* (2016); Earle *et al.* (2018); Setzler & Tintelnot (2019); Hjort *et al.* (2019); Alfaro-Urena *et al.* (2019)). See e.g. Aitken *et al.* (1996); Conyon *et al.* (2002); Egger & Kreickemeier (2013); Helpman *et al.* (2013); Sun (2018) on technological or production style differences in multinationals that raise worker productivity or attract more productive workers.

[2] See Adams & Williams (2019); DellaVigna & Gentzkow (2019) on firms that do not adjust their product prices to local contexts, and Clemens & Gottlieb (2017) on benchmarked (to a large competitor) pay-setting. Recent research has also shown that many societies are averse to pay inequality (Card *et al.* , 2012; Mas, 2017; Breza *et al.* , 2017; Cullen & Perez-Truglia, 2018; Dube *et al.* , 2019), and that such attitudes can influence firms' wage-setting practices (Harrison & Scorse, 2010). Cappelli & Chauvin (1991) pioneered the study of *institutionally required* pay equality within firms.

also contains many multinational public sector employers.

For our employment analysis, we link the dataset on multinationals to matched employer-employee administrative data from Brazil. Thirty-seven of the firms in our dataset have establishments in Brazil, allowing us to investigate the employment implications of wage anchoring in detail.

The paper proceeds in three parts. We begin by showing that the average wage a given multinational pays *domestic* (non-expat) workers within a given narrowly-defined occupation at foreign establishments is highly correlated with the average wage the employer pays workers in the same occupation at the headquarters. The same is true for the employer's wage slope—the difference between the wages it pays workers in similar jobs of slightly higher versus lower skill requirements. Wage anchoring is observed across the whole occupation skill range, but the correlation is highest for low-skill occupations, such as cleaners, drivers, and security guards. The multinationals in our sample ultimately pay most jobs in lower-income foreign countries wages that, relative to GDP per capita, are an order of magnitude or more—in some cases two—higher than what they pay workers in the same position at the headquarters.[3] We include fixed effects that rule out conventional explanations operating through productivity differences across firm×occupations or city×year. The anchoring we observe in the full sample is driven by multinationals headquartered in inequality-averse countries as measured by sociologists (Hofstede, 1991, 2001), suggesting that the sources of the multinational pay premium may go beyond differences in technology and production style.[4]

In the second part of the paper we show that multinationals transmit externally imposed changes in wages at the headquarters to their foreign establishments, indicating that at least part of the correlation we established in the first part of the paper is causal. To do so we first exploit changes in home country and state minimum wage laws. We document that low-skill wages in "treated" and "control" establishments that are located in the same foreign city evolve similarly before the minimum wage is increased in the country or state where the headquarters of treated establishments is located. We therefore compare changes in wages across the two groups before and after such events. Next we compare changes in wages in foreign establishments in jobs for which a home country's or state's minimum wage is more binding for the same job at the headquarters to other low-skill jobs within the same foreign establishment for which it is less binding. Finally, we compare changes in wages in the foreign establishments of firms whose headquarters are highly exposed to minimum wage changes because of its employment structure and those of other firms that are headquartered in the same

[3] In the Appendix we show that all our results are very similar for private-sector firms and other types of employers. For simplicity, we use "firm" and "employer" interchangeably.

[4] Hofstede (1991, 2001)'s measures of culture are widely used across the social sciences, including in economics (Tabellini, 2010; Gorodnichenko & Roland, 2011; Bloom *et al.* , 2012b; Martinez *et al.* , 2015; Bandiera *et al.* , 2019). We cannot rule out that other ways in which inequality-averse and inequality-tolerant home countries (or the firms headquartered in each) differ explain the estimated differences in firm wage-setting, although we find little empirical support for this possibility. Of course, a firm's "culture" can manifest itself in wage-setting procedures in many different ways.

country or state whose headquarters are less exposed. In combination, these approaches provide compelling evidence that minimum wage-induced wage increases at the headquarters directly raise wages in firms' foreign establishments. We show that plausible alternative interpretations, such as offshoring of jobs or tasks, endogenous timing of minimum wage changes, or induced technological upgrading, are unlikely to explain the estimated impact on wages paid abroad.

We exploit exchange rate shocks as a second source of externally-imposed changes to wages at headquarters. We show for example that, when the measured-in-USD headquarter wages of a (non-U.S.) multinational increase after an off-trend appreciation of the home country currency, foreign establishment wages are also increased in response.[5] However, exchange rate-induced wage changes are transitory, suggesting that any impact on employment should be muted relative to that of long-lasting wage changes arising from increases in the minimum wage of the home country or state. Transmission abroad of both types of externally-imposed changes to wages at headquarters occurs also in firms producing and/or purchasing non-tradable goods and services, and for non-offshorable jobs.

The multinationals that extend wage changes arising from minimum wage and exchange rate shocks in the home country/state to their foreign establishments are the same ones that descriptively appear to anchor wages to levels at headquarters: those headquartered in inequality-averse countries. The implied compression of wages across establishments within firms is in line with how many firms themselves report to set wages, within and across borders (Culpepper and Associates Inc, 2011; Alfaro-Urena *et al.* , 2019).[6]

In the third part of the paper, we examine the implications of wage anchoring for employment using both the multinational data and the Brazilian administrative data. We first confirm that the results from the earlier parts of our analysis hold also in the Brazilian administrative data. The wage multinationals pay individual workers in Brazil is robustly correlated with and responds to externally imposed shocks to the wages of workers in the same position at the headquarters.

We then explore how the extensive and intensive margins of employment abroad respond to headquarter wage shocks. We find that multinationals that anchor their wages to the headquarters tend to lay off workers in low-skill positions and lower hiring in their foreign establishments following an externally imposed wage increase at the headquarters. We also see some low-skill occupations being

[5] We expect transmission of exchange rate-induced changes in measured-in-USD wages at headquarters to foreign establishments if either the multinational computes the wages to pay in local currency in a way that ensures partial alignment across headquarters and foreign establishments, or if the multinationals pays its foreign workers in (or partially indexes their wages to) the home country currency (see Section 5 for details).

[6] In a recent survey of primarily North American employers operating in multiple locations, 29 percent report paying the same *nominal* wages across locations (Culpepper and Associates Inc, 2011). Similarly, a growing list of firms—including Amazon, IKEA, Walmart, and at least 58 other large employers—have self-imposed, country-wide wage floors in the U.S. (National Employment Law Project, 2016). Alfaro-Urena *et al.* (2019) report survey evidence that multinational corporations pay high wages abroad in part to "ensure cross-country pay fairness within the MNC" Alfaro-Urena *et al.* (2019, p. 2).

removed from foreign establishments following a wage increase at the headquarters. This is consistent with work by Goldschmidt & Schmieder (2017) showing that firms may change their employment structure by outsourcing some jobs when wages are compressed and downwardly rigid. However, these findings hold only for permanent (minimum wage-induced) wage increases for low-wage jobs. We find no employment response to temporary (exchange rate-induced) headquarters (and foreign) wage increases, as expected. We also find that the types of multinationals that do not transmit wage increases at the headquarters to their foreign establishments—those from less inequality-averse societies—also do not to change the occupational structure of their foreign establishments in response to externally imposed, permanent headquarter wage increases.

In sum, this paper shows that many large multinationals do not fully adjust wages to local contexts and instead link the wages of workers abroad to the wages of workers in the same position at the headquarters. This wage-setting behavior affects such firms' economic activity across countries.

Our analysis contributes to several strands of the literature on how firms set wages and organize their activities across space. First, we use a new type of data on large multi-establishment firms' operations across countries to document a novel regularity, namely that many firms anchor their wages to the level at headquarters. Our analysis builds on recent findings on invariability in firms' decisions across different contexts, especially DellaVigna & Gentzkow (2019).[7] We connect this body of evidence with the literature on spatial wage differences, seen by many as key to understanding the process of economic development itself (see e.g. Moretti, 2011; Clemens *et al.* , 2019).

Second, by establishing a particular reason why some firms pay higher wages than others in a given labor market, this paper helps uncover the nature of the well-known but poorly understood phenomenon of firm wage effects (see among others Card *et al.* , 2013, 2015; Barth *et al.* , 2016; Bloom *et al.* , 2018; Card *et al.* , 2018). The wage anchoring we document is consistent with existing evidence of rent-sharing (Van Reenen, 1996; Card *et al.* , 2018) and the use of benchmarks for pay-setting (Clemens & Gottlieb, 2017), but to our knowledge represents the first direct evidence of firm "wage cultures".[8] Our research design builds on the seminal work of Bloom & Van Reenen

[7] DellaVigna & Gentzkow (2019) show that many U.S. retailers charge nearly identical prices across large zones of the U.S. The literature on invariability in firms' decisions across contexts originates in the seminal work of Kahneman *et al.* (1986). Recent empirical studies have documented constraints imposed on the wages firms pay different workers in a given worksite or country by workers' fairness preferences (Card *et al.* , 2012; Mas, 2017; Breza *et al.* , 2017; Cullen & Perez-Truglia, 2018; Dube *et al.* , 2019). On relative pay comparisons, see also Akerlof & Yellen (1990); Fehr & Schmidt (1999), and the lab-based experimental studies surveyed in—and following on from—Rabin (1998).

[8] Budd *et al.* (2005); Martins & Yang (2015) document a high elasticity of average wages in *foreign affiliates* with respect to general variation in parent firm profits, consistent with our results. Card *et al.* (2018) review the broader literature documenting that some firms share rent with workers via higher wages. Clemens & Gottlieb (2017) show that payments from private health insurers to small physician groups in the U.S. are often benchmarked to those of a large public insurer (Medicare). Akerlof & Kranton (2005); Hermalin (2013) survey the literature on corporate culture. This literature is primarily theoretical—with some important exceptions (see e.g. Guiso *et al.* , 2015)—and to our knowledge has not made use of empirical strategies intended to separate firm culture from conventional economic phenomena

(2007); Bloom *et al.* (2012a) showing that multinationals "transport" their practices across borders, and Harrison & Scorse (2010)'s evidence that home country attitudes toward pay levels abroad can influence firms' wage-setting there.

This paper also presents what to our knowledge is the first evidence of *across-country* margins of adjustment to—and components of the incidence of—minimum wages.[9] In this sense, and in our analysis of transmission of exchange rate shocks to wages across borders, the paper also relates to emerging evidence of shocks spreading across space inside firms (Boehm *et al.* , 2019; Giroud & Mueller, 2019; Giroud & Rauh, 2019).

Finally, we take a first step toward understanding how the use of firm-wide wage-setting procedures affect the organization of economic activity across countries (see e.g. Feenstra & Hanson, 1996; Dube & Kaplan, 2010; Blinder & Krueger, 2013; Aghion *et al.* , 2017). The literature on the consequences of institutionally required pay equality began with Cappelli & Chauvin (1991); see Propper & Reenen (2010) and Boeri *et al.* (2018) for more recent evidence. Lemieux *et al.* (2009) initiated the study of firms' decision of whether or not to directly tie workers' compensation to their performance and its consequences for wage inequality. Our analysis also builds on Goldschmidt & Schmieder (2017)'s evidence that a particular type of German firm—those that generally pay high wages—outsource the lowest-skill occupations (see also Grossman & Helpman (2007)), and Harrison & Scorse (2010)'s (mixed) evidence on the consequences for multinationals' operations in Indonesia of wage increases in response to activism. We provide first-look evidence of the way that multinationals that anchor their wages to the headquarters change their employment decisions and occupational structure abroad.

2 Data and Summary Statistics

2.1 Data on job-level wages at multinationals' establishments

The primary dataset we use comes from a consulting company (which we refer to as "the Company") that gathers information on compensation at establishments—multinationals' headquarters and other establishments—around the world. When a firm uses the Company's consulting services, its own Human Resources personnel report information on its positions and corresponding compensation; specifically, positions that are present in a firm's establishments, the tasks and responsibilities associated with these positions, and their average gross and net monthly total pay.[10] The resulting

that predict similar regularities in a firm's decisions.

[9]The minimum wage literature is large: see e.g. Neumark & Wascher (1992); Card & Krueger (1995); Lee (1999); Aaronson & French (2007); Draca *et al.* (2011); Autor *et al.* (2016); Engbom & Moser (2018); Harasztosi & Lindner (2019); Horton (2018); Neumark (2018); Haanwinckel (2019); Cengiz *et al.* (2019).

[10]Pay data come from a firm's HR records while tasks associated with specific occupations are gathered using in-depth qualitative interviews and quantitative surveys. The Company then maps these tasks/responsibilities associated with a job into specific, harmonized job titles.

dataset includes 298 harmonized position titles, which we refer to as occupations or jobs. Because these occupations are defined globally by the Company, whose core business proposition relies on its ability to harmonize occupations across employers and countries, the data is likely to be far more comparable across contexts than those generated by heterogeneous statistical agencies.

The Company maps the 298 jobs into 16 skill levels. Examples of low-skill jobs include cleaner, guard, and data entry clerk. Middle-skill jobs include administrative assistant, systems analyst, and finance officer, while high-skill jobs include senior legal counsel, regional office manager, and human resources director.

The dataset covers the years 2005 through 2015. While data from the multinationals are collected each year, not all of their establishments are included every year. As discussed more in the next section, the dataset is thus an unbalanced panel at establishment$\times$year level.

Our primary outcome variable is the average nominal gross wage of domestic workers employed in a given job at a given establishment and year, measured in current U.S. dollars.[11] In Section 7 we study the relationship between a firm's wage-setting and the jobs that are present in its foreign establishments.

2.2 Multinationals in the data, sample construction, and summary statistics

The full sample of multinationals we study includes 1,060 employers. The majority are large private sector firms, while a sizeable minority are multinational public sector employers (such as large, international NGOs, multilateral organizations, etc). As shown in Appendix Figure A1, the private sector firms come from a variety of sectors, including manufacturing (25 percent), financial services (16 percent), petroleum (11 percent), telecommunications (7 percent), technology (5 percent), and pharmaceuticals and health services (5 percent).[12] The publicly listed U.S. firms in our data account for about one-third of the total revenue of all publicly listed U.S. firms.[13]

As clients of the Company, the multinationals in our data choose which establishments report data to the Company in a given year. The Company informed us that employers generally choose a rotation rule for establishments to report[14], and that there is some variation in HR personnel's

[11] Our dataset does not cover expat workers. The Company informed us that expat workers are very rare in most of the occupations observed in the dataset. Most of the multinationals in the sample report their compensation data to the Company in USD. The Company converts the data of employers that report in local currency to USD.

[12] Sectors are defined according to the Standard Industrial Classification, with NGOs and other multinational public sector employers classified separately. The multinational public sector employers in our data also include national banks and various branches of government that tend to have establishments abroad.

[13] See Hjort *et al.* (2019), who study macroeconomic consequences of differences in what private-sector multinationals pay high-skill workers in richer versus poorer countries using a subset of the data from the Company we analyze in this paper, for details.

[14] Examples of such rules are e.g. "all foreign establishments report every year, but the headquarters only reports every fifth year" and "foreign establishments rotate in and out, each reporting every third year, and the headquarters never reports". There is also some regional variation: some multinationals include their foreign establishments across

response/non-response. The establishment×year panel structure of the data appear to confirm this. The included establishments are also skewed toward local headquarters, though many of these also employ production workers.

We include both private sector and public sector multinationals in our primary samples because the sources of the form of across-country wage compression we study may apply to both types of employers, and also because the highly saturated econometric specifications we use limit statistical power in some parts of our analysis. However, we show all key results also for the private-sector-firms-only subsample; these are generally very similar to those from the full sample.

The raw dataset includes around 1,800 employers and establishments located in 170 cities around the world, all but four of which are capital cities, but not all employers in the raw data are multinationals. The three samples of multinationals we conduct our analysis on are summarized in Table 1. Our full sample (Sample 1) consists of the 1,060 employers for which we have wage data from at least one foreign establishment, regardless of whether we have data on the headquarters. This sample includes 5,783 foreign establishments. As shown in Appendix Figure A2, these are distributed across the world. In contrast—and also shown in the figure—most headquarters are located in Europe and North America, although some are in Asia, Latin America, and Africa, in part because the Company's primary focus is to collect data on establishments located in low- and middle-income countries. We use Sample 1, in addition to the more narrowly defined samples discussed next, when we analyze the impact at foreign establishments of external shocks that influence wages in headquarter locations in sections 4-7.[15]

In the descriptive analysis in Section 3 we directly compare the wages of workers in an employer's foreign establishment to those at the headquarters. For this purpose, we first restrict the sample to employers for which we observe at least one job in the headquarters and its foreign establishment(s) (Sample 2). This leaves us with 91 unique employers, their 1,184 foreign establishments, and 79,130 establishment×job×year observations, as shown in Panel A of Table 1. We then further restrict the sample to those multinationals for which at least one such job is observed in the headquarters and at least one foreign establishment in the same year (Sample 3). This yields the narrowest analysis sample (Sample 3), consisting of 74 employers, their 618 foreign establishments, and 20,739 establishment×job×year observations.[16] We use samples 2 and 3 both in Section 3 and when we

the globe, while some include only those on certain continents.

[15]Data on wages at the multinational's headquarters are available for around 10 percent of the multinationals in Sample 1. Estimating the impact of shocks in home countries/states is nevertheless feasible because we observe home country/state minimum wage changes and exchange rate shocks in auxiliary data. More details are in sections 4-7.

[16]In Sample 2 we do not require that the same occupation is observed in an establishment and the headquarters of the employer in the exact same year. Some multinationals in our sample do not provide data to the Company on all of their establishments every year they are surveyed. For this reason, for a substantial fraction of foreign establishment occupation wages we do not observe a corresponding headquarter occupation wage in the exact same year, but we do observe such a corresponding occupation wage in another close-in-time year within the same employer. In some exercises, we impute the missing occupation-specific wage values using observations on the same occupation at the

analyze the impact of external shocks that influence wages in headquarter locations in Sections 4-5. The right-hand side of Panel A of Table 1 provides more details on which part of the analysis we use each sample for.

Panel B of Table 1 display summary statistics for employers in each of the three samples of multinationals. The mean nominal wage the multinationals in Sample 1 pay across their foreign establishments is USD 18,512 (in 2005 dollars), with a standard deviation of USD 12,889. The corresponding numbers are USD 18,615 and USD 12,459 in Sample 2 and USD 23,927 and USD 15,227 in Sample 3. The multinationals in Sample 1 have on average around 25 different jobs, of 9 different skill levels, present in an average of five foreign establishments, while those in samples 2 and 3 have respectively 31/10/11, and 27/10/8.

2.3 Additional data sources

We match our global data on the wages and jobs at multinationals' foreign establishments to three additional types of data, starting with minimum wage and exchange rate data that enable us to establish a causal link between wages at headquarters and in foreign establishments. We then bring in data on attributes of home countries and their firms that may influence wage-setting practices. Finally, we match the global data to employer-employee administrative data from Brazil to study the employment consequences of wage anchoring.

Shocks to headquarter wages We gather information on two types of shocks in home countries or states that are external to the firm, but that may influence wages at multinationals' headquarters: changes in minimum wages and exchange rates. Country-level minimum wage data come from the International Labour Organisation (ILO), and state-level minimum wage data from the United States (used if the firm is headquartered in the U.S.) come from Vaghul & Zipperer (2016) (see also Cengiz *et al.* (2019)). Yearly data on the home country's exchange rate (in local currency units per USD) come from the World Bank (see Appendix II for details).

Home country/firm attributes We make use of data on cultural attitudes and the economic context of home countries and their firms that may predict wage-setting practices. Our preferred measures of cultural attributes come from Hofstede (2001)'s "cultural dimensions", which were originally constructed from a survey of IBM employees. These measures are especially useful as they are available for, and comparable across, over 80 countries, and extensively validated (see e.g. Yoo *et al.* , 2011). They are widely used in social science research, including in economics (see e.g. Tabellini, 2010; Gorodnichenko & Roland, 2011; Bloom *et al.* , 2012b; Martinez *et al.* , 2015; Bandiera *et al.* , 2019). Specifically, we use Hofstede (2001)'s *Power Distance* measure of inequality-aversion, which captures a group's willingness to accept inequality among its members. The variation across countries in this measure of inequality aversion is shown in Appendix Figure A3. Less inequality-averse

same establishment or headquarters in close-in-time surveyed years.

countries and regions include for example France, Eastern Europe, India, North and West Africa, and the North-Eastern countries in Latin America. More inequality-averse countries and regions include for example most of Europe, Eastern Africa, the South-Western countries in Latin America, and Canada and the U.S.[17]

We also collect and make use of a range of measures of countries' and country-pairs' economic and political context (such as GDP per capita, inequality, regulations, geographic and cultural proximity, etc), some of which correlate with inequality-aversion.

Matched employer-employee data from Brazil Finally, we use Brazil's longitudinal matched worker-firm database, the *Relação Anual de Infomações Sociais* (RAIS) to study wages and employment outcomes in multinationals' foreign establishments in granularity, albeit in a more particular context in which a smaller set of multinationals operate. To do so, we focus on the 37 employers in the global dataset that operate an establishment in Brazil. More information about these firms can be found in Appendix II and Appendix Table A1.

3 Anchoring to Headquarter Wages

In this section we begin by documenting a robust correlation between the wages multinationals pay the workers employed in a given position at the headquarters and in foreign establishments. We then explore correlates of this relationship to begin to shed light on why some multinationals anchor wages to the headquarters.

3.1 Across-country wage patterns

We first document patterns in the raw data that point toward a close relationship between the wages a multinational pays its workers at home and abroad. In Panel C of Table 1, we display employers' mean headquarter wage at each of the four quartiles of their within-headquarters wage distribution, focusing on Sample 3 as defined in Sub-section 2.2. The mean wage is roughly USD 13,000 in the lowest quartile and USD 51,000 in the highest quartile. We also display, by headquarter wage-quartile, employers' wage levels at their foreign establishments as a percentage of their wage level for the same jobs at the headquarters. The nominal wages paid to workers in foreign establishments are on average around 88 percent of those paid to headquarter workers in the same job in the same year, a number that is quite stable across the wage distribution and similar (77 percent) also for foreign establishments located in countries that are poorer than the home country. While these numbers

[17]The strongest predictors of inequality-aversion we found were a higher GDP per capita, higher (Gini) inequality, and a stronger regulatory environment. For more information on the Hofstede measures, including the other five cultural dimensions—Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation, and Indulgence—see https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture/ and https://www.hofstede-insights.com/. These usefully explain e.g. why the U.S. is considered (and measured) to be inequality-averse but individualistic.

are themselves remarkably high, they imply that real wages at foreign establishments are much higher than headquarter wages, given the countries in which headquarters and foreign establishments respectively are located (see Appendix Figure A2).

In Panel D of Table 1 we show results from a decomposition breaking the overall variance in wages observed among the multinationals in our dataset into its various across- and within-firm components, akin to Gartenberg & Wulf (forthcoming). 43 percent of the variation in establishment×job×year level log wages—adjusted only for sector, city, and job—is across-firm, while only 26 percent is within-firm and across establishments.[18] These numbers are similar in samples 1, 2, and 3, and also if we restrict to private-sector multinationals.

3.2 Estimating wage anchoring

To estimate the extent of wage anchoring, we correlate the wages paid to workers in a particular occupation at a firm's foreign establishments with the wages paid to workers in the same occupation at the firm's headquarters. Specifically, we run

$$\mathrm{w}_{jfct} = \beta_1 \mathrm{HQw}_{jft} + \beta_2 x_{jct} + \theta_{fj} + \theta_{ct} + \varepsilon_{jfct} \tag{1}$$

where w_{jfct} is the log average wage of workers in job j at firm f's establishment in foreign city c in year t. A job or occupation here means a specific position such as driver, administrative assistant, or human resources director. HQw_{jft} is the log average wage of workers in the same job at firm f's headquarters in year t. We control for a benchmark measure of the foreign city "market" wage of workers in job j in year t in two ways (both represented by x_{jct} in (1)). The first, $\bar{\mathrm{w}}_{j(-f)ct}$, directly measures how much multinationals *other than firm* f in our sample are paying their workers in job j in foreign city c in year t. The correlation between a multinational's wage level and other employers' wages in the same city and year is a natural benchmark to which we can compare the correlation between a given firm's wage level abroad and at home. Our second control for market wages—a fixed effect for job j in city c in year t, θ_{jct}—is more restrictive than $\bar{\mathrm{w}}_{j(-f)ct}$, but does not yield a benchmark coefficient to which $\hat{\beta}_1$ can be compared.

Throughout our analysis we include firm×job fixed effects θ_{fj} to account for differences across firms in the productivity of workers in job j, and city×year fixed effects θ_{ct} so that we only compare establishments located in a given city and at a given point in time. We measure all wage levels as the log of the relevant nominal, pre-tax wage in USD, and cluster standard errors at the firm level.

The results from estimating equation (1) are presented in Table 2, where Panel A shows the results

[18] In addition, 20 percent of the variance in wages is within-establishment and across-occuptions, and 12 percent within-establishment×occupation, across-years. If we do not adjust wages for sector, city, and occupation fixed effects, the across-employer and within-establishment×occupation, across-years variance component are considerably smaller and the within-establishment, across-occupation component considerably larger.

when controlling for the average wage paid by other multinationals and Panel B shows the results if we instead include the job×city×year fixed effects. We find a strong correlation between foreign establishment and headquarter wages. As seen in Column 1 of Table 2 and Panel C of Appendix Figure A4, 10 percent higher wages at the headquarters are associated with 1.5 percent higher foreign establishment wages for workers in the exact same position. The within-firm-across-country correlation in wage levels is at least as large as the correlation between a given establishment's wage level and the local average paid by other multinationals to workers in the same job.

The estimated correlation between foreign establishment and headquarter wages is robust to instead including wage observations from foreign establishment jobs that do not necessarily have a same-job-and-year counterpart at the headquarters in the sample. We do this in four different ways. In the first two we continue to (as in Column 1) use the sample for which we observe the relevant job at the headquarters in the same year as at the foreign establishment (Sample 3). In Column 2 we collapse the data to the skill-level and look at the within-year correlation between the foreign establishment and headquarter wages of jobs that are not necessarily identical positions but of the same skill level.[19] In Column 3, we collapse the data to the firm level and correlate the average wages paid in the headquarters and establishment, regardless of occupation or skill match.[20] In the last two approaches we extend the analysis to firms for which foreign establishments and the headquarters are not necessarily interviewed in the same years (Sample 2). To do this, we replace w_{jfct} and HQw_{jft} with time-adjusted cross-sectional average occupation-specific wages in the establishment and the headquarters (Column 4), or, alternatively, imputed values of the outcome variable (Column 5). These four approaches in columns 2-5 all yield estimates of wage anchoring ($\hat{\beta}_1$) that are considerably larger in magnitude than our preferred estimate of 0.15 from Column 1.[21]

[19] We correspondingly replace firm×job fixed effects θ_{fj} with firm×skill-level fixed effects θ_{fl}, job-specific local benchmark $\bar{\mathrm{w}}_{j(-f)ct}$ with skill-level-specific local benchmark $\bar{\mathrm{w}}_{l(-f)ct}$ (Panel A), and job×city×year fixed effects θ_{jct} with skill-level×city×year fixed effects θ_{lct} (Panel B).

[20] Correspondingly, firm×job fixed effects are replaced with firm fixed effects θ_f, and the controls for market wages are subsumed by city×year fixed effects θ_{ct}.

[21] In Column 4, the cross-sectional average wage of occupation j in the establishment of firm f located in city c (either a headquarters or a foreign establishment) is the estimate $\hat{\mathrm{w}}_{jfc}$ from a two-way fixed effect model $\mathrm{w}_{jfct} = \mathrm{w}_{jfc} + \theta_t + \epsilon_{jfct}$. The corresponding controls for market wages become (1) the cross-sectional average wage paid to occupation j by other firms in city c, $\bar{\hat{\mathrm{w}}}_{j(-f)c}$, and (2) occupation×city fixed effects. As $\widehat{\mathrm{HQw}}_{jf} := \hat{\mathrm{w}}_{jfh(f)}$ is subsumed by firm×occupation fixed effect θ_{fj}, we replace θ_{fj} with firm fixed effect θ_f and occupation fixed effect θ_j. In Column 5, we impute the values of the outcome variable in missing years using the fitted values from the estimation of the following two-way fixed effect model: $\mathrm{w}_{jfct} = \mathrm{w}_{jfc} + \mathrm{w}_{jct} + \epsilon_{jft}$, $\hat{\mathrm{w}}_{jfc} + \hat{\mathrm{w}}_{jct}$. All establishments—all foreign establishments and headquarters—are included in the estimation, while the imputation is conducted only on foreign establishment occupations to avoid double counting data points which provide effective information. The model has a fit of $R^2 = 0.98$. As the cross-sectional component $\hat{\mathrm{w}}_{jfc}$ is mechanically highly correlated with firm×occupation fixed effect θ_{fj}, we replace θ_{fj} with firm fixed effect θ_f and occupation fixed effect θ_j (similarly to in the cross-sectional regression discussed above). Note that the fact that the estimates are very similar when we compare wages in jobs of a given skill level in Column 2 versus the exact same position as in Column 1 (see also Panel A of Appendix Figure A4) may in itself point toward "egalitarian" firm-wide wage-setting policies, a possibility we come back to below.

The estimates in Table 2 are similar if we restrict the sample to private sector firms, as shown in Appendix Table A2. In Section 7 we show that these results also hold and are of similar magnitude when using individual-level data from Brazil.

The correlation we have established in this sub-section leaves open the possibility that headquarters and foreign establishment wages are not directly linked via firms' wage-setting procedures, but instead both driven by overlapping third factors, such as changes in a firm's technology or production style. In sections 4-5 we use external shocks to wages to show that the results in Table 2 are in part due to headquarter wages themselves affecting foreign establishment wages.[22] Before doing so, however, we explore where and how wage anchoring occurs in more detail.

3.3 Unpacking wage anchoring

To begin to understand the wage anchoring we established in sub-section 3.2, we first demonstrate that the slope of the wage profile across jobs of consecutive skill levels at multinationals' foreign establishments is also highly correlated with the slope at the firm's headquarters. We replace the outcome variable w_{jfct} in equation (1) with a corresponding measure of the establishment's wage slope. To construct this measure, we consider occupational categories rather than narrowly-defined occupations (or jobs) themselves. A given occupational category o—for example, administrative jobs—tends to have jobs of multiple skill levels represented within an establishment.[23] Focusing on occupational categories thus allows us to construct a measure of the difference between the average wage of jobs that are of skill level $l+1$ versus skill level l but otherwise similar, in the foreign establishment of firm f that is located in city c at time t: $\nabla \text{w}_{o(l,l+1)fct}$. We also replace the independent variable of interest HQw_{jft} with an analogously defined measure of the corresponding wage slope at the headquarters, $\nabla \text{HQw}_{o(l,l+1)ft}$.[24] The results, reported in columns 1 and 4 of Panel B in Table 3, are similar to those in Table 2. A 10 percent larger difference in occupational category-specific headquarter wages between jobs of consecutive skill levels are associated with a 1.1 percent larger difference in establishment wages between workers of the same occupational category and skill levels.[25]

We next show that, although the slope of the wage profile at multinationals' foreign establishments appears to be linked to that at their headquarters, wage anchoring is significantly greater in low-skill than higher-skill jobs. We interact HQw_{jft} with indicators for the relevant job being

[22] We also show that there is no evidence of the reverse effect.

[23] The 298 jobs (or occupations) of 16 skill levels in the dataset we analyze belong to 26 occupational categories.

[24] The first local benchmark measure, occupation-specific average wages paid by other employers $\bar{\text{w}}_{j(-f)ct}$, is replaced with the analogously defined slope measure $\nabla \bar{\text{w}}_{o(l,l+1)(-f)ct}$; and the second benchmark measure, occupation×city×year fixed effects θ_{jct}, is also replaced by occupation-category×skill level-pair×city×year fixed effects $\theta_{o(l,l+1)ct}$. Firm×occupation fixed effects θ_{fj} are analogously replaced by firm×occupational category×skill level-pair fixed effects $\theta_{fo(l,l+1)}$.

[25] The estimates are similar if we restrict the sample to private firms, as shown in columns 1 and 4 of Panel B in Appendix Table A5.

respectively middle- and high-skill, as opposed to low-skill. In Appendix Table A3 we show that 10 percent higher wages at headquarters are associated with around 2.7 percent higher foreign establishment wages in low-skill jobs; 1 percent higher foreign establishment wages in middle-skill jobs; and 1.2 percent higher foreign establishment wages in high-skill jobs.[26]

We expect firm-wide wage-setting procedures to be more common in some types of firms than others. To investigate, we first relate the extent of wage anchoring we observe in a firm to cultural attributes of the home country, specifically the measure of attitudes toward inequality described in Section 2. We estimate

$$\mathrm{w}_{jfct} = \left(\beta_1 + \beta_1^{\mathrm{L}} \text{Low Ineq. Aversion}_{h(f)}\right) \mathrm{HQw}_{jft} + \beta_2 x_{jct} + \theta_{fj} + \theta_{ct} + \varepsilon_{jfct} \tag{2}$$

where Low Ineq. Aversion$_{h(f)} = 1$ if multinational f is headquartered in an inequality-tolerant country.[27] Such countries have a higher degree of tolerance for power and income inequality than average.

We find that the correlation between foreign establishment and headquarter wage levels observed in the full sample is driven by multinationals headquartered in inequality-averse countries. We show this in columns 2 and 5 of Table 3 and panels B and D of Appendix Figure A4. Thus, for wage anchoring to operate through worker productivity, a firm's headquarters and foreign establishment workers would need to become more or less productive simultaneously; such concurrent changes in productivity would need to occur to a greater extent for workers in low-skill jobs; and across-country concurrent changes in productivity would need to occur only in firms headquartered in inequality-averse countries.

In contrast, we find no relationship between inequality aversion in the country where a given foreign establishment is located and the extent to which its wages correlate with those of the parent multinational's headquarters, as shown in columns 3 and 6 of Panel A in Table 3. The correlation between wage slopes at multinationals' foreign establishments and their headquarters is also concentrated in multinationals headquartered in inequality-averse countries, but statistically unrelated to inequality aversion in establishment countries, as seen in columns 2 and 5 versus 3 and 6 of Panel B in Table 3.[28]

While we cannot rule out that the estimated relationship between inequality aversion and wage

[26] The results are again very similar when the control for market wages is the average job-specific wage paid by other firms and occupation×city×year fixed effects respectively (see columns 2 and 4 of Appendix Table A3). The results are also similar if we restrict the sample to private-sector firms, as shown in Appendix Table A4.

[27] We classify home countries as culturally inequality-averse or not based on whether they score above or below the median of Hofstede (2001)'s Power Distance measure (see Sub-section 2.3).

[28] Like our sample-wide estimates of wage anchoring discussed in Sub-section 3.2, our estimates of the degree to which anchoring of wages to the headquarters is driven by cultural attitudes are very similar when we restrict the sample to private sector firms, as shown in Appendix Table A5. Note also that we find no evidence that firms learn over time such that anchoring-to-the-headquarters falls with time spent operating in a given foreign city (results available from the authors upon request).

anchoring captures other home country or firm characteristics that influence wage-setting practices, we find little empirical support for this possibility. To show this we re-run (2) with additional interactions between the job-specific log wage at the headquarters and three categories of country and country-pair level attributes included: (i) measures of the home country's economic environment, such as the country's income inequality, GDP per capita, collective bargaining and/or union coverage in the public and the private sectors, its regulatory environment, and urbanization and education levels; (ii) measures of the bilateral relationship between the home country and foreign establishment countries, including whether the establishment country is higher-income than the home country, and Head & Mayer (2014)'s measures of "gravity" (in particular various measures of cultural and historical bonds, geographical proximity, and trade connections); and (iii) characteristics of the sector the multinational operates in, such as the sector's labor share, skill share, input and output tradeability measures, and job offshorability.[29]

The results are presented in appendix tables A6-A8. Some of the home country and home-foreign establishment country-pair characteristics themselves predict wage anchoring in a multinational.[30] However, none explain the relationship between home country inequality aversion and anchoring, which remains large in magnitude and statistically significant throughout. Several other measures of home country culture that are correlated with inequality aversion, such as altruism, positive reciprocity, and trust (Falk *et al.* , 2018), also predict wage anchoring, but none as robustly as inequality aversion.

Of course, a firm's "culture" can manifest itself in its wage-setting procedures in many different ways. For example, firms headquartered in culturally inequality-averse countries may benefit more than other firms from entering into multilateral relational contracts with the firm's entire workforce rather than bilateral relational contracts with smaller groups of employees (Levin, 2002). Another possibility is that monitoring workers' productivity may conflict with the broader management practices that prevail in inequality averse countries (Falk & Kosfeld, 2006; Blader *et al.* , forthcoming; de Rochambeau, 2019), in which case firms headquartered in such countries may adopt HR systems in which a given wage is attached to a given job (Lemieux *et al.* , 2009, 2012). This could lead some multinationals to index the wages of foreign workers in a given position to that of headquarter workers in the same position. We leave testing between such underlying motivations for future research.

[29]The gravity measures include a common language index, a dummy for common religion, a dummy for common legal origin, a dummy for a historical colonial relationship, bilateral migrant stocks, the distance between capital cities, a dummy for sharing a border, a dummy for sharing a time zone, a dummy for regional trade agreements, etc. See details of the measures in (i), (ii) and (iii) in Appendix II.

[30]The signs of the estimated coefficients on these predictors are generally unsurprising. For example, wage anchoring is more common among firms headquarted in countries with lower levels of inequality, although inequality itself predicts wage anchoring to a much smaller extent than inequality-aversion.

4 Changes in Foreign Wages in Response to Externally Imposed Changes in Headquarter Wages: Minimum Wage Shocks

In this and the next section we provide evidence of a *direct* link between a multinational's headquarter wages and the wages of domestic workers in its foreign establishments, suggesting that at least part of the correlation we established in Section 3 is causal. We demonstrate this using two sources of exogenous variation in headquarter wages: minimum wage and exchange rate shocks in a firm's home country or state. We primarily focus on the full sample of multinationals (Sample 1 in Table 1), providing corresponding estimates for samples 2 and 3 where relevant.

4.1 Event study analysis of minimum wage shocks

To test whether minimum wage shocks in a multinational's home country or state affect the wages of foreign establishment workers, we begin with an event study analysis. We look within a city, using establishments whose headquarters are located in countries/states that experience a minimum wage increase in year t as our treated establishments and establishments in the same city whose headquarters are in a country/state that does not experience a minimum wage increase in year t as control establishments. We then compare the evolution of workers' wages in the treated and control establishments by estimating

$$\mathrm{w}_{jfct} = \sum_{k=-3}^{3} \alpha_k^1 \mathbf{I}(\mathrm{MINw}_{h(f),t-k} > 0) + \theta_{fj} + \theta_{ct} + \sum_{k=-3}^{3} \alpha_k^2 \%\Delta\mathrm{MINw}_{h(f)t-k} + \varepsilon_{jfct} \qquad (3)$$

on the sample of low-skill jobs (whose wages may directly respond to minimum wage changes).

The dependent variable, w_{jfct}, is defined as in (1) in Section 3. The independent variable of interest, $\mathbf{I}(\mathrm{MINw}_{h(f)t-k} > 0)$, is an indicator for treatment; that is, the minimum wage in multinational f's home country/state increasing in year t. The coefficient $\hat{\alpha}_k^1$ thus represents the difference in wages paid to workers in a specific job in treated foreign establishments and that paid to workers in the same job in control establishment in the same city in year k. We control for the magnitude of the corresponding change in the headquarters minimum wage in percent terms (see also Cengiz *et al.* , 2019), $\%\Delta\mathrm{MINw}_{h(f)t}$, and cluster the standard errors at the home country/state level.[31]

We see clear evidence that the wages of workers in treated establishments increase relative to

[31] We adopt the same fixed effects controls and the same standard error clustering procedure throughout Section 4. Because the minimum wage changes we study are used as events, we follow Cengiz *et al.* (2019) and specify our independent variable of interest as the percent change in the minimum wage. Additionally, our minimum wage data are in local currencies. Using the percent change in a country's/state's minimum wage lets us avoid the additional complication of converting local currencies to USD, which could confound minimum wage shocks with exchange rate fluctuations. We estimate equation (3) using the sample of multinationals that experience only one minimum wage shock during a given five-year period so that we can cleanly identify the effect of a single wage change on establishment wages. Later, when we focus on the impact of a minimum wage change in year t on wages in year t, we use the full sample.

those in control establishments after a minimum wage increase in the home country or state. In Figure 1 we plot the coefficients $\hat{\alpha}_k^1$ relative to the average job-level wage paid at an establishment in the year before the minimum wage shock ($k=-1$). Wages in treated establishments appear to break from the trend, increasing by over USD 500/year in the year immediately after the minimum wage shock in the home country/state relative to wages at $k=-1$. In control establishments, workers' wages in the same year increase by about USD 175. Importantly, the evolution of the average wage of workers in treated and control establishments is virtually indistinguishable before such minimum wage change events.

4.2 Average effect on foreign establishment wages

The patterns in Figure 1 suggest that changes in home country and state minimum wage laws can be used to estimate the impact of headquarter wage changes on foreign establishment wages. To do so, we first show results from a reduced-form regression relating the wages paid in a foreign establishment in year t to changes in minimum wages in the home country/state in year t from year $t-1$, controlling for firm×job and city×year fixed effects as throughout our analysis and clustering standard errors at the home-country level (or the home-state level for U.S.-headquartered firms):

$$\%\Delta \text{w}_{jfct} = \alpha_1 \%\Delta \text{MINw}_{h(f)t} + \theta_{fj} + \theta_{ct} + \varepsilon_{jfct} \tag{4}$$

We find that a 10 percent increase in the home country's or state's minimum wage is associated with a 0.4 percent average increase in the wages of low-skill jobs at foreign establishments, as shown in Column 3 of Panel A in Table 4. In Appendix tables A9 and A10 we show that this estimate is larger in magnitude and remains significant if we restrict the sample to private-sector firms, and that there is no estimated response in the wages of middle- and high-skill jobs in foreign establishments.

Wage anchoring appears to be a headquarters effect. In particular, we find no effect of minimum wage changes in the country where a given foreign establishment is located on wages at the headquarters of the parent firm, nor on wages at foreign establishments that are part of the same firm but located in other countries, as shown in columns 1 and 2 of Appendix Table A16.

Next we instrument for headquarter wages with the home country/state minimum wage to document a direct impact of headquarter wages on foreign establishment wages. We first regress the change in the average wage firm f pays workers in a given job j at the headquarters in year t, $\%\Delta \text{HQw}_{jft}$, on the change in the minimum wage in the country or state where the headquarters is located, $\%\Delta \text{MINw}_{h(f)t}$. This first stage relationship is shown in Column 3 of Panel B in Table 4. A 10 percent increase in the home country's/state's minimum wage is associated with a roughly 1 percent increase in the wages of low-skill jobs at the headquarters.[32] We then instrument for

[32] The first stage is: $\%\Delta \text{HQw}_{jft} = \gamma_1 \%\Delta \text{MINw}_{h(f)t} + \theta_{fj} + \theta_t + \varepsilon_{jft}$, where for headquarters ($c = h(f)$), city×year fixed effects ($\theta_{h(f)t}$) are replaced with year fixed effects (θ_t) and city fixed effects ($\theta_{h(f)}$), subsumed by firm×job fixed effects θ_{fj}), so that the independent variable of interest is not subsumed.

the change in job-specific headquarter wages, replacing $\%\Delta\text{MINw}_{h(f)t}$ in (4) with the first-stage estimates $\%\Delta\widehat{\text{HQw}}_{jft}$. To include all jobs in foreign establishments and headquarters in our analysis sample, we estimate the second stage using two-sample two-stage least squares (TS2SLS) (Angrist & Krueger, 1992; Inoue & Solon, 2010).[33]

The results, shown in Column 3 of Panel C in Table 4, imply that a 10 percent increase in the wages of workers in a given low-skill job at a multinational's headquarters that is induced by a minimum wage increase raises the wages of workers in the same job at the foreign establishments of the same multinational by 4 percent.[34]

The results are very similar to the full-sample (Sample 1) results in Column 3 of Table 4 if we instead of TS2SLS use a standard one-sample two-stage least square (2SLS) approach on the sample of jobs in foreign establishment for which we directly observe headquarter wages for the same job in the same year (Sample 3), and in the sample for which we can impute such corresponding headquarter wages (Sample 2). This is shown in columns 1 and 2 of Table 4.[35] In Section 7 we show that, at least in Brazil, the results in Table 4 also hold within individual workers and after accounting for induced changes in contracted work-hours.

We interpret the results in Table 4 as indicating that externally imposed changes in multinationals' headquarter wages directly affect their foreign establishment wages. In the next sub-sections we show that the three most plausible alternative interpretations—endogenous timing of, or offshoring or technology adoption in response to, minimum wage changes—are unlikely to explain these results.

4.3 Threats to identification

1. Endogenous timing of minimum wage changes Home country/state minimum wage changes may themselves—beyond firm-wide wage-setting procedures—be endogenous to the wages of foreign workers. It could be, for example, that policymakers are more likely to raise minimum wages when a country or state's aggregate labor demand is high (see e.g. Baskaya & Rubinstein,

[33] As noted above, the difference in sample size between panels A and B is coming from the fact that the number of employer×occupations for which we have data on establishment wages but not headquarter wages in a given year is larger than the number of those for which we have data on headquarter wages but not establishment wages in a given year. This is simply because many multinationals in the full sample provide data on their headquarters to the Company only periodically or never do so. Using TS2SLS thus increases power. TS2SLS provides a consistent estimate if (the probability limit of) the correlation between the endogenous variable(s) and the instruments (conditional on controls) is the same in the first-stage sample and the second-stage sample. Intuitively, this assumption requires that the average treatment effect of home country/state minimum wage increases on the (unobserved) headquarters low-skill wages in the subset of multinationals that have no such information in our data is similar to the that on the (observed) headquarter low-skill wages of the subset of multinationals that have such information. Readers can alternatively focus on the reduced form estimates.

[34] When we restrict attention to private-sector firms, the results are similar but larger in magnitude, as shown in Column 2 of Panel C in Appendix Table A9.

[35] In Sample 2 we impute the headquarter wages of a given occupation for unsurveyed years by linearly interpolating occupation-specific log headquarter wages on log home country/stage minimum wages over time. The reduced form, the first stage and the second stage estimates are similar in samples 1, 2, and 3, and the estimates in Sample 1 are more precise as using a larger sample increases statistical power.

2015; Neumark, 2018), and that home country/state labor demand is highly positively correlated with multinationals' demand for labor abroad. However, fluctuations in demand for foreign labor that co-vary with home country/state minimum wage changes should arguably extend beyond the particular part of the wage distribution or the particular type of firm most affected by changes in minimum wages themselves. We thus compare changes in the average wage of, first, workers in higher and lower-wage low-skill jobs within a given establishment, and second, workers in establishments whose headquarters have relatively more versus fewer low-wage workers.

Comparing wage changes across the low-skill wage distribution within a given foreign establishment-year enables us to "difference out" the impact of broader fluctuations in labor demand on foreign wages. Suppose the country or state a firm is headquartered in raises its minimum wage at some point during our data period. We then define the new minimum wage as (loosely) binding for job j in city c ($\text{Binding}_{jc}=1$) if one of the establishments in our sample that are located in city c paid its workers in job j a nominal gross wage lower than the new minimum wage in the year immediately preceding the minimum wage change.[36] Binding jobs are thus a smaller subset of low-skill jobs. When firms are headquartered in a city where $\text{Binding}_{jc}=1$, we define the new minimum wage as binding ($\text{Binding}_{jh(f)}=1$) also for job j in the firms' foreign establishments.

The reduced form relationship between home country/state minimum wage changes and the wages of binding versus non-binding jobs in foreign establishments is:

$$\%\Delta \text{w}_{jfct}=\alpha_2 \%\Delta \text{MINw}_{h(f)t}\times \text{Binding}_{jh(f)}+\theta_{fj}+\theta_{fct}+\varepsilon_{jfct} \tag{5}$$

The minimum wage change itself and any possibly correlated demand shocks that affect both binding and non-binding jobs are absorbed by firm×establishment×year fixed effects, θ_{fct}.[37]

We find significantly larger effects of home country/state minimum wage changes on wages paid to foreign workers in jobs for which the minimum wage binds at the headquarters than on the wages

[36] Given the unbalanced nature of our establishment×year panel, we a priori face a trade-off between constructing a measure of bindingness that is specific to a given firm/headquarters, and measuring bindingness as close in time as possible to the minimum wage change. We opt for a labor market-level measure of bindingness (akin to Card & Krueger (1995) and subsequent industry-level studies) for power reasons: the sample of firms for which we observe everything required to define a firm-specific, stricter measure of bindingness and still compare changes in foreign wages after a minimum wage change within narrowly-defined binding and non-binding jobs is too small to achieve meaningful estimates. Many jobs—especially those that are likely subject to the minimum wage—are present in many different establishments. Our labor market-based measure of bindingness is thus a loose measure of the relevance of the minimum wage for a given firm×job combination. This may lead us to underestimate the differential effect on wages in binding and unbinding jobs within a given firm.

[37] In equation (5), firm×establishment×year fixed effects subsume city×year fixed effects. The corresponding first stage estimation equation is: $\%\Delta \text{HQw}_{jft}=\gamma_2 \%\Delta \text{MINw}_{h(f)t}\times \text{Binding}_{jh(f)}+\theta_{fj}+\theta_{ft}+\eta_{jft}$, where for headquarters ($c=h(f)$), firm×year fixed effects (θ_{ft}) are equivalent to firm×establishment×year fixed effects ($\theta_{fh(f)t}$). Since we include firm×establishment×year fixed effects θ_{fct}, we thus restrict the sample to firm×establishment×years for which we observe both binding and non-binding jobs.

of workers in other low-skill jobs in the same foreign establishment. The reduced form results shown in Column 1 of Panel A in Table 5 indicate that a 10 percent increase in the home country's/state's minimum wage results in a 0.9 percentage point larger increase in wages for binding low-skill jobs compared to non-binding ones.[38] We also leave out firm×establishment×year fixed effects so that the effect of home country/state minimum wage increases on the wages of workers in non-binding jobs can be identified. As seen Column 2 of Panel A in Table 5, the estimated effect of a 10 percent minimum wage increase on the wages of workers in non-binding jobs at the foreign establishments of a multinational is statistically insignificant and much smaller in magnitude (0.16 percent) than that for binding jobs.[39]

Home country or state labor demand that directly affects multinationals' foreign wages and also encourages home country/state minimum wage increases may disproportionately be demand for low-wage workers. If so, a strategy of focusing on the differential wage response in foreign jobs for which the minimum wage binds at the headquarters will only partially difference out any such direct effects of the underlying drivers of minimum wage changes. On the other hand, causal effects of minimum wage changes on the wages of workers that are higher up in the low-skill wage distribution within a given foreign establishment may arise through market-driven spillover effects in wage-formation (Teulings, 2003; Haanwinckel, 2019) (see also Engbom & Moser (2018)), or through firms' wage-setting procedures, in which case the approach in Panel A of Table A11 will underestimate the true effect on the wages of low-wage workers in multinationals' foreign establishments. To make progress, we next compare the wage response of *employers* that are headquartered in the same country or state but differentially exposed to minimum wage changes.

Following Lee (1999) and Autor *et al.* (2016) (see also Neumark (2018)), we measure *firm*-level bindingness as the ratio between the ex ante minimum wage and the firm's median wage at the headquarters (the so-called Kaitz index). Specifically, we interact the independent variables of interest in equations (4) and (5) respectively with Kaitz_{ft} and estimate:

$$\%\Delta \text{w}_{jfct} = \alpha_3 \%\Delta \text{MINw}_{h(f)t} \times \text{Kaitz}_{ft} + \theta_{fj} + \theta_{ct} + \theta_{h(f)t} + \varepsilon_{jfct} \tag{6}$$

[38] The corresponding differential increase for binding relative to non-binding low-skill jobs at the headquarters is 2.1 percentage points (see Column 3 of Panel A in Table 5). The second stage estimate implies that a 10 percent minimum wage-induced increase in headquarter wages in binding jobs results in an increase in foreign establishment wages that is 4.2 percentage points greater than any simultaneous change in the wages of other low-skill jobs in the same foreign establishment (see Column 3 of Panel A of Apprendix Table A11).

[39] We find a (statistically insignificant) zero effect of minimum wage increase on the wages of workers in non-binding jobs at the headquarters (see Column 4 of Panel A in Table 5). We also find that the estimated differential effects on the wages of workers in binding jobs where firm×establishment×year fixed effects are dropped (columns 2 and 4 of Panel A in Table 5) are of similar (if anything smaller) magnitude to those where firm×establishment×year fixed effects are included (columns 1 and 3), suggesting that the differential effect is not driven by any possibly larger increase in the labor demand of firms that employ more workers in binding jobs.

and

$$\%\Delta \text{w}_{jfct} = \left(\alpha_4^{\text{B}} \text{Binding}_{jh(f)} + \alpha_4^{\text{N}} \left(1 - \text{Binding}_{jh(f)}\right)\right) \times \text{Kaitz}_{ft} \times \%\Delta \text{MINw}_{h(f)t} \qquad (7)$$
$$+ \alpha_5^{\text{B}} \text{Binding}_{jh(f)} \times \%\Delta \text{MINw}_{h(f)t} + \theta_{fj} + \theta_{h(f)t} + \varepsilon_{jfct}$$

where the change in the minimum wage and any correlated macro-level demand shocks affecting the home country/state are now absorbed by home country/state×year fixed effects $\theta_{h(f)t}$.[40]

We find that the wages of foreign workers in low-skill jobs and the lowest-wage jobs (for which the minimum wage is binding at the headquarters) are more affected by a minimum wage increase in the home country/state in firms for which the prior minimum wage was more binding at the headquarters. The estimates of $\hat{\alpha}_3$ and $\hat{\alpha}_4^{\text{B}}$ are reported in Column 1 of panels B and C of Table 5. They imply for example that a 10 percent increase in the home country's/state's minimum wage results in an increase in foreign establishment wages of low-skill (binding) jobs at a firm at the 75th percentile of bindingness that is around 0.34 (0.31) percentage points greater than at another firm headquartered in the same country or state that is at the 25th percentile of bindingness.[41]

We also find evidence of spillover effects of minimum wage changes higher up in the wage distribution within a given foreign establishment: the estimated impact on the wages of workers in non-binding jobs is greater in more binding firms, $\hat{\alpha}_4^{\text{N}} > 0$. This finding has a natural interpretation insofar

[40] In equation (7), firm×establishment×year fixed effects are replaced by home country/state×year fixed effects and city×year fixed effects, as firm-level bindingness does not vary within each firm×establishment×year cell. In the corresponding first stage estimations for headquarters ($c = h(f)$), home country/state×year fixed effects ($\theta_{h(f)t}$) are equivalent to city×year fixed effects (θ_{ct}).

[41] The average within-home country/state-year difference in the 75-percentile Kaitz and the 25-percentile Kaitz is 0.025. Therefore the differential effect of the same 10 percent minimum increase on the establishment wages of low-skill (binding) occupations is 0.025×1.373×10=0.34 (0.025×1.243×10=0.31) percentage points higher for a 75-percentile binding firm compared to a 25-percentile binding firm from the same home country or state in the same year. The corresponding number for the differential effect on the headquarter wage of low-skill (binding) occupations is 0.025×4.705×10=1.2 (0.025×4.045×10=1.0) percentage points (see Column 3 of panels B and C of Table 5). We also show the corresponding second stage estimates linking differential changes in headquarter wages to differential changes in foreign stablishments directly (see Column 3 of panels B and C of Appendix Table A11). The estimates are slightly smaller than that looking at the differential wage increases of binding jobs compared to non-binding ones within the same establishment (Column 3 of Panels A of Appendix Table A11). Note that we also leave out home country/state×year fixed effects so that the effect of home country/state minimum wage increases on the wages of workers in low-skill (non-binding) occupations in multinationals with medium-level firm bindingness (Kaitz) can be identified. As seen in Column 2 of Panel B of Table 5, the estimated effect of a 10 percent minimum wage increase on the wages of low-skill jobs at the foreign establishments of a medium-level binding firm is 0.5 percent, which is similar to the average effect of home location minimum wage changes on all foreign establishment low-skill jobs (0.4 percent, see Column 3 of Panel A in Table 4). As seen in Column 2 of Panel C of Table 5, the estimated effect of a 10 percent minimum wage increase on the wages of non-binding jobs at the foreign establishments of a medium-level binding firm is 0.14 percent and statistically insignificant, which is similar to the average effect of home location minimum wage changes on all foreign establishment non-binding jobs (0.16 percent, see Column 2 of Panel A of Table 5). The estimated coefficients on the interaction terms of home country/state minimum wage change and the firm bindingness measure are robust to whether home country/state×year fixed effects are included (comparing columns 1 and 3 with columns 2 and 4 in panels b and C in Table 5).

as firms have "wage cultures": the managers of firms that are highly exposed to minimum wage changes may then choose to raise the wages of most workers in a given establishment when they are induced to raise the wages of a high proportion of those workers by changes in minimum wage laws.

The results in panels B and C of Table 5 suggest that potential heterogeneity in labor demand that covaries with minimum wage changes is to a large extent *firm*-specific rather than *occupation*-specific. This in turn implies that the concern discussed above—that home country/state labor demand that directly affects multinationals' foreign wages and also encourages minimum wage increases at home could disproportionately be demand for low-wage workers—is unlikely to drive our estimates.

In combination, the evidence we have presented makes clear that endogenous timing of minimum wage changes is not the primary explanation for the estimated transmission of headquarter wage increases to multinationals' foreign establishments.

2. Offshoring in response to minimum wage changes A second alternative interpretation of the results in Sub-section 4.2 focuses on within-firm offshoring of jobs or tasks. Suppose, for example, that a range of higher-skill jobs are initially done at multinationals' headquarters, and a range of lower-skill jobs at their foreign establishments, akin to Feenstra & Hanson (1996)'s model of offshoring. A minimum wage-induced increase in headquarter wages could then lead firms to shift the lowest-skill jobs previously done at the headquarters to their foreign establishments. This could lead to a simultaneous rise in foreign establishment and headquarter wages.

To test for this possibility, we compare the transmission of headquarter wage increases to a firm's foreign establishments in more and less "offshorable" jobs and tasks, measuring how offshorable a job is following Blinder & Krueger (2013) (see Appendix II for details).[42] As seen in columns 1 and 4 of Panel A in Appendix Table A12, the estimated impact on the wages of workers in non-offshorable low-skill jobs is similar to that on the wages of workers in offshorable low-skill jobs.[43]

Wage transmission is also not driven by complex, multi-task jobs for which the offshoring of tasks can more plausibly occur than in simpler, "single-task" jobs. This argument is supported both by the absence of home country/state minimum wage impact on the wages of jobs that are middle- or high-skill at the foreign establishment (see Column 1 of Appendix Table A10), as well as a similar estimated impact on low-skill jobs that are multi-task versus single-task (see columns 2 and 5 of

[42] Specifically, we estimate (4) but include an interaction between $\%\Delta\text{MINw}_{h(f)t}$ and an indicator for the relevant job having an above-mean offshorability index—being more offshorable than the average occupation.

[43] In theory it could be that the wages of workers in offshorable jobs at foreign establishments rise because of offshoring when a headquarter wage increase is externally imposed on the firm, and the wages of workers in non-offshorable jobs rise because of complementarity between the two groups of workers. Notice, however, that our analysis focuses on workers in *low-skill* positions, for whom such offshorable/non-offshorable complementarity is presumably limited. Our results in Section 7 on changes in employment at foreign establishments are also hard to reconcile with this possible explanation of why we find similar impact on the wages of workers in offshorable and non-offshorable jobs.

Panel A in Appendix Table A12).[44]

In Section 7 we show evidence suggesting that the set of jobs that are present in the foreign establishments of firms that transmit headquarter wage increases abroad *shrinks* when there is a minimum wage increase at the headquarters. An offshoring story would if anything predict an expansion of the set jobs that are present in the foreign establishments.[45]

A possibility that is conceptually distinct from offshoring—the movement of jobs across borders—is that *outsourcing* of jobs from foreign establishments to outside of the firm (or job destruction) magnifies the impact on wages abroad if, for example, the firm chooses to remove the lowest-wage jobs when induced to increase wages. However, notice that such a dynamic can only occur if wages in foreign establishments are directly affected by home country/state minimum wage increases in the first place. We return to this possibility in Section 7.

In sum the evidence discussed in this sub-section suggests that a within-firm offshoring phenomenon is unlikely to explain the transmission of minimum-wage induced headquarter wage increases to multinationals' foreign establishments that we estimated in Sub-section 4.2.

3. Technology adoption in response to minimum wage changes A third alternative interpretation of the results in Sub-section 4.2 is that firms invest in capital or upgrade their technology in response to home country/state minimum wage increases, and these changes affect the entire firm (see e.g. Aaronson & Phelan, 2017; Lordan & Neumark, 2018). This could increase the marginal productivity of the firm's workers in foreign establishments, consequently raising their wages. To test for this possibility, we check whether the impact of home country/state minimum wage increases on the wages of a firm's foreign workers is concentrated in jobs or tasks we expect to be complementary with computerization and automation.

Autor & Dorn (2013) argue that computer capital substitutes for low-skill workers performing *routine* tasks; complements *abstract* tasks; and neither directly substitutes for nor complements *manual* tasks.[46] As shown in Panel B of Appendix Table A12, the impact of home country/state minimum wage increases on the wages of foreign establishment workers in abstract and non-routine jobs is similar to, and if anything smaller than, that for non-abstract and routine jobs. This is difficult to reconcile with technology adoption explaining the estimated impact of headquarters minimum

[44] A description of how we measure job tasks is in Appendix II. Note that we also find a null effect of home country/state minimum wage changes on the wages of offshorable and non-offshorable jobs of middle- and high-skill levels in foreign establishments (see Column 2 of Appendix Table A10). In addition, recall that we observe a considerably greater extent of anchoring-to-the-headquarters in low-skill compared to middle or high-skill jobs (see Table A3).

[45] In Column 2 of Appendix Table A9 we re-estimate the regression in Table 4, restricting the sample to the set of occupations that were already present in the relevant foreign establishment before the minimum wage hike. The results are similar to those in Table 4.

[46] See Appendix II for details on the construction of these measures.

wages on multinationals' foreign establishment wages.[47]

In combination, the results we have presented in Sub-section 4.3 suggest that the estimated impact of increases in multinationals' headquarter wages arising from minimum wage increases in the home country/state on foreign establishment wages is at least in part due to wage anchoring.

5 Changes in Foreign Wages in Response to Externally Imposed Changes in Headquarter Wages: Exchange Rate Shocks

In this section we provide further evidence that, in many multinationals, headquarter wages directly affect the wages of domestic workers in foreign establishments using another source of exogenous variation in headquarter wages: exchange rate shocks to the home country's currency. Exchange rate-induced variation in headquarter wages is a useful complement to the minimum wage-induced wage changes we exploit in Section 4 for two reasons. First, unlike minimum wages, exchange rates both increase and decrease over time, allowing us to investigate multinationals' wage responses in both directions. Second, as we show below, exchange rate-induced changes in wages are temporary. Employers are thus unlikely to make concurrent changes in their technologies or employment structures in response.

If a multinational does not fully index its headquarter wages to international currencies such as the USD, a home country currency appreciation will lead to an increase in headquarter wages measured in terms of such currencies. Wages at the multinational's foreign establishments will also be raised (in international currency terms) in response to such a home country currency appreciation under the following two forms of wage anchoring:

1. USD-value wage-level anchoring A firm that pays in local currencies (that is, each establishment's local currency) or in USD might compute the wages to pay at the headquarters and abroad using up-to-date exchange rates in a way that ensures that its wages are (partially) aligned in USD terms. The exchange rate updating and the wage adjustment may for example be automatically done within a firm-wide HR system.

2. Home country currency anchoring If a firm pays its foreign establishment workers in, or partially indexes their wages to, the home country currency, then home country exchange rate shocks will be directly transmitted to the firm's foreign establishments, as long as nominal wages paid

[47] We also find no effect of a home country/state minimum wage change on the wages of routine and non-routine, abstract and non-abstract, manual and non-manual jobs in middle- and high-skill levels in the foreign establishments (see columns 3-5 of Appendix Table A10).

abroad are not fully adjusted for changes in purchasing power because of wage rigidity.[48]

5.1 Average effect on foreign establishment wages

We begin by estimating the relationship between home country exchange rate shocks and wages at a firm's foreign establishments and at its headquarters:

$$w_{jfct} = \alpha_6 e_{h(f)t} + \theta_{fj} + \theta_{ct} + \varepsilon_{jfct} \tag{8}$$

Here, $e_{h(f)t}$ is the detrended log average nominal exchange rate of home country currency units per unit of USD in year t.[49] Standard errors are clustered at the home country (or currency zone) level. We here follow the same sample selection rules, estimation methods, and table formatting as in the minimum wage analysis in Sub-section 4.2, in particular, as in Table 4.

We find that a home country currency appreciation increases the dollar value of the wages paid to workers in multinationals' foreign establishments. As seen in Panel A of Table 6, our estimates imply for example that a 100 percent decrease in the exchange rate of home country currency to USD leads to a 15 percent increase in the dollar value of wages in foreign establishments. Panel B shows that home country currency appreciation also raises the dollar value of the wages paid to workers at the headquarters, a 100 percent appreciation for example leading to a 50-70 percent increase in headquarter wages.[50]

[48] Nominal rigidity is important here: wage level anchoring is not a necessary condition for exchange rate transmission under home country currency anchoring, as long as nominal wages paid in foreign establishments do not perfectly covary with home country currency exchange rates. This is comparable to exchange rate pass-through of imported goods priced in origin country currencies (see e.g. Gopinath *et al.* (2010) for evidence of such pass-through).

[49] Unlike in Section 4 where only low-skill jobs are included in the main minimum wage analysis, we include all jobs here as exchange rates presumably affect the (USD value of) wages of all jobs. Only foreign establishments located outside the home country or currency zone are included, as same-currency-zone foreign establishment wages mechanically respond to exchange rate shocks also in the absence of anchoring. Note that our estimates in this section are identified off of the sample of multinationals that are not headquartered in the U.S. or in countries that peg their currency to USD, which make up 53 percent of the multinationals in full sample. As we do not observe the point-in-time exchange rates when wages are paid out, we approximate these using annual exchange rates retrieved from the World Bank. The resulting measurement error in the exchange rates is the main reason why we adopt the log specification in this section instead of the percentage change specification, as taking the first difference exacerbates the measurement error and the problem of attenuation bias (see Griliches & Hausman, 1986). The first-stage estimation equation is $HQw_{jft} = \gamma_6 e_{h(f)t} + \theta_{fj} + \theta_t + \varepsilon_{jft}$. Since we include establishment-city×year fixed effects (or year fixed effects in the first stage), any depreciation or appreciation of the USD against other currencies is subsumed. Since we include establishment-city×year fixed effects, which subsume establishment-country×year fixed effects, it is equivalent 1) to measure the foreign establishment wages in either the USD (our approach) or the local currency, and 2) to use the home-country-currency-to-USD exchange rate (our approach) or the home-to-establishment-country-currency bilateral exchange rate.

[50] The effect of home country currency appreciation on headquarter wages is smaller than 100 percent ($\hat{\gamma}_6$>-1), which implies that home country currency appreciation leads to an decrease in headquarter wages in terms of the domestic currency. There are several reasons why this might be the case. First, multinationals are likely to *partially* index headquarter wages to the USD or to domestic-currency-depreciation-induced inflation. Second, currency appreciation raises the cost of home country labor relative to that of foreign labor, which can decrease home country labor demand (Campa & Goldberg, 2001; Goldberg & Tracy, 2001). Third, domestic currency appreciation makes the option of working abroad less attractive

We next instrument for headquarter wages, replacing $e_{h(f)t}$ in (8) with the first stage estimates, $\widehat{\text{HQw}}_{jft}$. We find that exchange rate-induced changes in headquarter wages lead to changes in the wages firms pay workers abroad. The estimates in columns 1-3 in Panel C of Table 6 imply that a 100 percent increase in headquarter wages in response to an exchange rate shock leads to a 20-30 percent increase in foreign establishment wages.

As the descriptive wage anchoring shown in Section 3 and the impact of minimum wage-induced changes in headquarter wages on multinationals' foreign wages shown in Section 4, the impact of exchange rate variation-induced changes in headquarter wages on foreign wages is seen also in the sub-sample of private sector firms (see Column 1 of Appendix Table A13). We do not find any evidence of exchange rate shocks to a multinational's foreign establishment country currency affecting headquarter wages or the wages paid in the firm's establishments in other countries (see columns 3 and 4 of Appendix Table A16).

We also find suggestive evidence consistent with downward nominal wage rigidity combined with wage anchoring, as one might expect (see e.g. Kaur, 2019). For multinationals that pay foreign workers in local currency or the USD and engage in USD-value wage level anchoring (as defined above), home country currency appreciation (depreciation) is an upward (downward) force on the nominal wages paid abroad, and downward rigidity would imply that pass-through of appreciation should be larger.[51] Similarly, multinationals that pay foreign workers in home country currency might raise nominal wages to adjust for lower local purchasing power when the home country currency depreciates, while downward nominal rigidity may constrain their ability to lower nominal wages when the home country currency appreciates. Wage anchoring combined with downward nominal

to home country workers, which can lead to a rise in home country labor supply (Mishra & Spilimbergo, 2011). Finally, there may be attenuation bias in $\hat{\gamma}_6$ resulting from measurement error in the exchange rate. If such measurement error is classical, this might attenuate both our first stage and reduced form estimates but would not bias the IV estimate.

[51] Downward nominal rigidity need not always bind at foreign establishments, even under home country currency depreciation, if foreign wages are on a positive growth path. Consider the following non-parametrized representitive wage anchoring model with downward nominal rigidity:

$$\text{w}^c_{jfct} = \max\left\{\text{w}^c_{jfc,t-1}, f\left(\text{HQw}^c_{jft}, \bar{\text{w}}^c_{jct}\right)\right\}$$

where the superscript c indicates that the variable is measured in log nominal terms of country c's currency. $\text{w}^c_{jfc,t-1}$ sets a lower bound for the nominal wage at the foreign establishment in the next period w^c_{jfct}, and $f\left(\text{HQw}^c_{jft}, \bar{\text{w}}^c_{jct}\right)$ is the underlying "latent" wage corresponding to w^c_{jfct}. f, which is continuously differentiable, is increasing in both its arguments. These are the headquarter nominal wage in terms of the establishment country currency, $\text{HQw}^c_{jft} = \text{HQw}^{USD}_{jft} + e_{ct} = \text{HQw}^{h(f)}_{jft} - e_{h(f)t} + e_{ct}$, and the local nominal market wage $\bar{\text{w}}^c_{jct}$. Notice that f decreases in $e_{h(f)t}$, and increases in $\text{HQw}^{h(f)}_{jft}$ and $\bar{\text{w}}^c_{jct}$. If either the benchmark wages or the headquarter wages are on a positive growth trend ($\text{HQw}^{h(f)}_{jft} > \text{HQw}^{h(f)}_{jf,t-1}$ and/or $\bar{\text{w}}^c_{jct} > \bar{\text{w}}^c_{jc,t-1}$), then there might exist some $e^* > e_{h(f),t-1}$ such that $f|_{e^*, e_{ct}, \text{HQw}^{h(f)}_{jft}, \bar{\text{w}}^c_{jct}} > \text{w}^c_{jfc,t-1}$, and $\text{w}^c_{jfct} = f$ decreases in $e_{h(f)t}$ for $e_{h(f)t} \in \left(e_{h(f),t-1}, e^*\right)$ (depreciation in year t).

rigidity thus predicts a larger transmission of home country currency appreciation compared to depreciaton under both the forms of wage anchoring that induce employers to transmit exchange rate-induced wage changes abroad discussed above. This is indeed what we find: as seen in columns 4 and 5 of Table 6, wages in foreign establishments are 2.7 times as responsive to home country currency appreciation as they are to depreciation, although wages in the home country are equally responsive to exchange rate shocks in both directions, as we might expect.[52]

The impact of shocks to the exchange rate of the home country currency on foreign establishment wages is transitory. Panel B of Appendix Figure A5 shows that the impact of such shocks on headquarter wages (in USD terms) is itself transitory. Exchange rate fluctuations therefore do not affect longer-run "latent" wages at foreign establishments.[53] Downward nominal rigidity suggests that current exchange rate shocks—especially appreciation shocks—might influence the future nominal wage at the foreign establishment by affecting the current nominal wage there and thereby imposing a (binding) lower bound in the following years. However, empirically this lower bound does not often bind in the following years, as wages are on a positive growth path (see e.g. Figure 1). As shown in Panel A of Appendix Figure A5 we find that the impact of home country exchange rate shocks—including appreciation shocks—on foreign establishment wages are indeed transitory.[54]

In Appendix I we again consider the three a priori most plausible alternative interpretations of the estimated transmission of externally imposed changes in headquarter wages: endogenous timing of, or offshoring or technology adoption in response to, the external shocks. Using similar strategies to those in Sub-section 4.3, we show that these are unlikely to explain our exchange rate results. The evidence thus suggests that exchange rate shock-induced changes in multinationals' headquarter wages directly cause changes in their foreign establishment wages.

[52]The estimated impact of home country currency appreciation and depreciation on foreign establishment wages is statistically significantly different at the 5 percent level, and the estimated effect of home country currency depreciation on foreign establishment wages is itself negative and statistically significant. A plausible reason is that foreign wages are on a positive growth path so that last year's nominal wage at the foreign establishment does not always bind even if the currency of the home country depreciates this year (see e.g. Figure 1). Home country currency appreciation or depreciation does not directly affect the nominal value or the domestic purchasing power of headquarter wages paid in home country currency, as least compared to those of anchored wages paid in foreign establishments. Therefore, downward nominal wage rigidity is less relevant for the wage-setting response of a wage-anchoring employer to home country exchange rate shocks in its headquarters than in its foreign establishments, perhaps explaining the less asymmetric response between appreciation and depreciation at headquarters.

[53]That is, the detrended home country exchange rate $e_{h(f),t-1}$ has no impact on USD value of headquarter wages in the next period $\text{HQw}_{jft}^{USD} = \text{HQw}_{jft}^{h(f)} - e_{h(f)t}$, and therefore it does not affect the latent variable f in the formula in footnote 51.

[54]Unlike an exchange rate shock, a minimum wage increase in a home country is in effect a permanent shock to the nominal wage of some jobs at headquarters, and therefore enter the long-run "latent" component f of the nominal wage-setting formula at foreign establishments (see footnote 51). We find no evidence that a minimum-wage-induced foreign wage increase is followed by a slow-down (mean reversion) in wage growth in the following years. Minimum wage increases thus appear to lead to a permanent increase in foreign establishment wages, as Figure 1 suggests.

6 Unpacking Wage Change Transmission

In sections 4 and 5 we documented that externally imposed changes in the wages multinationals pay workers in a given job at the headquarters lead to corresponding changes in the wages they pay workers in the same job abroad. We showed that such transmission occurs both in response to minimum wage- and exchange rate variation-induced changes in headquarter wages. The IV estimates of how foreign establishment wages respond to a given headquarter wage change from the two approaches are both slightly larger than the corresponding OLS estimates. Such a global response to externally imposed changes in headquarter wages points toward the existence of firm-wide wage-setting procedures. We saw in Section 3 that the overall correlation between the wages a multinational pays workers in a given job at its headquarters and foreign establishments is driven by multinationals headquartered in inequality-averse countries as measured by sociologists. A natural question is therefore whether such multinationals are also the ones driving the impact of externally imposed headquarter wage changes on foreign wages we estimated in the full sample.

This is indeed what we find in Table 7, where we repeat the regressions from Column 3 of panels A and B in tables 4 and 6, now interacting respectively $\%\Delta\text{MINw}_{h(f)t}$ and $\text{e}_{h(f)t}$ with the measure of societal inequality-aversion we made use of also in Section 3.[55] The estimated effects of home country/state minimum wage and exchange rate shocks on (the USD value of) wages at the headquarters are very similar for multinationals headquartered in inequality-averse and inequality-tolerant countries, as seen in Column 2. However, these externally imposed headquarter wage changes appear to affect the wages of workers at foreign establishments only in multinationals headquartered in inequality-averse countries, as shown in Column 1. Both the descriptive relationship between wages at multinationals' headquarters and foreign establishments and their partial transmission of externally imposed headquarter wage increases to foreign establishments we uncover in this paper are thus driven by a particular group of employers, pointing toward the existence of wage cultures.

7 Wage Change Transmission and Foreign Establishment Employment

We now take a first step toward understanding the consequences of across-country wage compression for employment at multinationals' foreign establishments. Existing evidence suggests that wage compression can lead firms to outsource low-wage jobs to avoid paying a premium for low-skill workers (Goldschmidt & Schmieder, 2017). If so, firms that anchor their wages to headquarter

[55] The reduced form estimation equations for foreign establishments, for example, become:
$\%\Delta\text{w}_{jfct} = \left(\alpha_1^{\text{H}}\text{High Ineq. Aversion}_{h(f)} + \alpha_1^{\text{L}}\text{Low Ineq. Aversion}_{h(f)}\right)\%\Delta\text{MINw}_{h(f)t} + \theta_{fj} + \theta_{ct} + \varepsilon_{jfct}$,
and $\text{w}_{jfct} = \left(\alpha_6^{\text{H}}\text{High Ineq. Aversion}_{h(f)} + \alpha_6^{\text{L}}\text{Low Ineq. Aversion}_{h(f)}\right)\text{e}_{h(f)t} + \theta_{fj} + \theta_{ct} + \varepsilon_{jfct}$.

levels may face an incentive to limit the set of jobs done in their establishments outside of the typically higher-wage home region, especially when faced with externally-imposed headquarter wage increases that are transmitted to foreign establishments.

We test this conjecture in two ways. We first use the global data from the Company to look at the impact of a headquarter wage shock on the extensive margin of employment—positions that are present in that one or more workers are employed in the relevant job—in foreign establishments. Because of the Company's focus on job-level wages, information on the *intensive* margin of employment—the number of workers employed in each position—is often missing in their data. To study the intensive margin of employment, we match the data from the Company to administrative employer-employee data from Brazil. Restricting our analysis to the set of multinationals that have establishments in Brazil, we investigate how wage shocks in the headquarters affect the intensive margin of employment abroad.

7.1 The extensive margin of employment

Recall from Section 6 that multinationals headquartered in inequality-averse countries transmit minimum wage-induced headquarter wage increases to their foreign establishments, while those based in inequality-tolerant countries do not. In the data from the Company, we observe whether an establishment employs workers in a given position in each year. From this we define the outcome "Job Leaves Establishment" as an indicator for a job being present in year t but not in year $t+1$. To understand how wage anchoring affects the extensive margin of employment abroad when wages rise at the headquarters, we then estimate the following regression:

$$\begin{aligned}\text{Job Leaves Establishment}_{jfc,t+1} = &\left(\alpha_7 + \alpha_7^{\text{L}}\text{Low Ineq. Aversion}_{h(f)}\right)\%\Delta\text{MINw}_{h(f)t} \\ &+\theta_{fj}+\theta_{ct}+\varepsilon_{jfct}\end{aligned} \tag{9}$$

We include firm×job and city×year fixed effects as in Sections 3 – 6.

We find that the multinationals that anchor wages to the headquarters and transmit externally-imposed wage changes to their foreign establishments are more likely to remove positions from their foreign establishments when an increase in the minimum wage raises wages at the headquarters. The estimated impact is larger for low-skill jobs, though not statistically significantly so. In contrast, the multinationals that tend not to transmit externally-imposed changes in headquarter wages to their foreign establishments also do not remove positions from their foreign establishments when wages rise at the headquarters. We show these results from estimating equation (9) in Panel A of Table 8.[56]

We find no evidence to suggest that home country exchange rate shocks affect the probability that

[56]The positions that are removed are no more or less likely to be offshorable ones (results available from the authors upon request).

a position is removed from a firm's foreign establishments, as seen in Appendix Table A15—despite such shocks' impact on wages at home and abroad.[57] This is unsurprising, as we saw in Section 5 that changes in foreign establishment (and headquarter) wages induced by changes in the home country's exchange rate are transitory. We thus restrict attention to the impact of long-lasting shocks to a firm's headquarter wages that arise from minimum wage changes in the remainder of this section.

7.2 The intensive margin of employment

Anchoring to headquarter wages as measured in Brazilian administrative data

To study how wages at a firm's headquarters affect the intensive margin of employment—layoffs and new hiring—abroad, we make use of matched employer-employee administrative data from Brazil. As described in Sub-section 2.3, the RAIS data contain information on each individual employee at each establishment, including his or her wage, education, race, gender, age and tenure at the establishment. Thirty-seven of the multinationals in our data have an establishment in Brazil. These multinationals are headquartered in 17 different countries, most commonly in Australia, France, Germany, the US, and the UK. We match the RAIS data on these firms to the Company data on the same firms, matching jobs by skill level.[58]

We begin by reaffirming the results from sections 3-5 in the administrative data from Brazil, starting from Panel A of Table 9. We find an almost identical descriptive estimate of the correlation between RAIS-measured wages in Brazilian establishments and data-from-the-Company-measured wages for workers in jobs of the same skill-level at the headquarters of the multinational as we did in the global data used in Section 3.

We also find that external shocks to wages in the home country or state—changes in minimum wages and the exchange rate of the country's currency—are transmitted to multinationals' RAIS-measured wages in Brazil. These results are shown in panels B and C of Table 9. The estimated impact of exchange rate shocks is remarkably similar to what we found using global data from the Company in Table 6 in Section 5. The same is true for the estimated impact of minimum wage changes, which is slightly larger than what we found in Table 4 in Section 4.[59] We also find a statistically significant

[57] This holds both for all positions in the foreign establishments and when restricting attention to low-skill positions only (see Panel A of Appendix Table A15). We also find (statistically significant but) economically negligible estimated intensive margin employment responses at Brazilian establishments to home country exchange rate shocks, in an analysis that is analogous to the minimum wage/intensive margin of employment one we show in Sub-section 7.2 below (see Panel B of Appendix Table A15).

[58] We match the RAIS data and the data from the Company by firm×year×job skill-level due the difficulty of matching individual positions in two data sources with narrowly-defined jobs/positions in the absence of a cross-walk. Recall that the jobs in the data from the Company belong to 16 different skill levels. Matching by skill level allows us to use much more of the data, although the results do not qualitatively change if we instead attempt to match by individual position.

[59] The wage observations for Brazil in the data from the Company and those from RAIS are highly correlated, at around 0.8. The main reason why the two are not perfectly correlated is likely that the Company measures total compensation—including for example variable and in-kind pay—whereas RAIS simply measures the wage itself, but

but quantitatively very small impact of minimum wage shocks in the home country/state on the wages of workers in higher-than-low-skill positions in Brazil; we return to this finding below.

The results in panels A-C of Table 9 generally hold also when we hold constant the *individual worker* in question, and both for the wage per reported and contracted hour worked. This strongly supports our causal interpretation of the evidence in sections 3-5, as the RAIS data is constructed by Brazilian authorities from administrative records and presumably suffers, if anything, from different forms of measurement error than any present in the data from the Company. It also suggests that the primary reason why wage changes at multinationals' headquarters that are transmitted to foreign establishments are sustained is not that higher wages allow foreign establishments to hire more productive individuals, nor corresponding changes in hours worked.

Almost all of the firms in our sample with Brazilian establishments are headquartered in inequality-averse countries so we unfortunately cannot compare the wage response in the Brazilian data across the two types of firms that we showed above to have different wage-setting practices.

Impact of external shocks to headquarter wages on the intensive margin of employment in Brazil as measured in administrative data We find a small but significant increase in the probability that workers in low-skill jobs are laid off and a decrease in hiring of new workers in multinationals' Brazilian establishments when the minimum wage rises in the home country or state. We show this in Panel B of Table 8. In columns 1-4, we present the results from estimating

$$\text{Worker Laid Off}_{ijfc,t+1} = \alpha_8 \%\Delta \text{MINw}_{h(f)t} + \gamma^{'} X_{it} + \theta_{ct} + \theta_{fj} + \epsilon_{ijfct} \tag{10}$$

where the dependent variable, Worker Laid Off$_{ijfc,t+1}$ is an indicator that equals one if employee i in firm f's Brazilian establishment is laid off in year $t+1$. We control for worker characteristics (X_{it}) such as education, tenure at the firm, gender, race, and age, as well as firm$\times$job and city$\times$year fixed effects as throughout our analysis. Standard errors are clustered at the home-location level.

Column 1 shows that an increase in the home country or state minimum wage has no significant impact on the probability that a given Brazilian worker is laid off *on average*. Recall from Table 9 that minimum wage shocks at the headquarters significantly raise the wages of workers in low-skill jobs in multinationals' Brazilian establishments. In Column 2 of Panel B of Table 8 we see that individual workers in low-skill jobs are 0.16 percentage points or about two percent more likely to be laid off after a 10 percent increase in the home country's or state's minimum wage.[60] In contrast, the point estimate suggests that workers in higher-than-low-skill jobs are 0.11 percentage points *less*

other differences across the two data sources may also contribute.

[60] A 0.16 percentage points change is approximately a two percent change when benchmarked against the mean layoff rate of 0.082. The estimated effect on low-skill positions is statistically significant at 1 percent level ($\hat{\alpha}_8$ = 0.016, s.e. = 0.003).

likely to be laid off after such a shock, but this estimate is not statistically significant.

In Table 9 we saw an increase in the wages of workers in higher-than-low-skill jobs in multinationals' Brazilian establishments after a minimum wage shock—an increase that is very small relative to the increase in the wages of workers in low-skill jobs, but nevertheless statistically significant. One possibility is that both this small impact on the wages of existing employees in higher-than-low-skill jobs and the decrease in the probability that workers in such jobs are laid off are explained by some degree of task-shifting from workers in lower- to workers in higher-skill jobs when the former group becomes proportionally more expensive to employ after a shock to wages at the headquarters (though we cannot rule out other explanations). This form of within-establishment task-shifting is directionally distinct from the offshoring-from-headquarters-to-foreign-establishment countries concern discussed in Sub-section 4.3 in that, here, tasks shift *away* from the workers in low-skill jobs abroad for whom we estimate relatively large, positive wage responses to home country/state wage shocks.[61]

The final results in Table 8—and in this paper—show that new job creation at the foreign establishments of employers that tend to anchor wages to headquarter levels decreases when wages rise at the headquarters for exogenous reasons. We again estimate equation (10), but now with the dummy Worker Newly Hired$_{ijfc,t+1}$—which is equal to one if the worker was hired in the past 12 months—replacing Worker Laid off$_{ijfc,t+1}$ as the outcome of interest. We find that individual workers in multinationals' Brazilian establishments overall are 0.1 percentage points or about two percent less likely to recently have been hired after a 10 percent increase in the home country's or state's minimum wage. This estimate is slightly larger for workers in low-skill positions, but not statistically significantly so.[62]

We began Section 7 with results suggesting that wage increases at the headquarters affect the occupational structure of the foreign establishments of firms with contrasting forms of wage-setting differently. When wages are increased at the headquarters, multinationals that partially transmit

[61] We find no evidence of heterogeneity in these responses across jobs that are or are not categorized as offshorable or having routine functions (and therefore being more easily replaceable by a machine). Interestingly, we also find no response in other forms of separations than lay-offs, such as quits. We can also repeat the extensive margin of employment analysis from columns 1 and 2 of Panel A of Table 8 using the Brazilian data. We do so in columns 3 and 4 of the same panel, but we lack power to achieve precise estimates in such regressions using the smaller sample of multinationals with establishments in Brazil. Consistent with the estimates from the global data in columns 1 and 2, the signs on the (imprecisely estimated) coefficients point toward a possible increase in the probability that low-skill positions are removed from Brazilian establishments when the minimum wage is increased in the home country or state. In contrast to the estimates from the global data, however, the (also imprecisely estimated) coefficients point toward a possible decrease in the probability that higher-than-low-skill positions are removed from Brazilian establishments in response to such shocks.

[62] A 0.10 percentage points change is approximately a two percent change when benchmarked against the mean new hiring rate of 0.052. The results on layoffs and new hires are similar if we include individual worker fixed effects (as in the wage analysis above): specific workers in low-skill jobs are 0.1 percentage point more likely to be laid off following a 10 percent minimum wage increase at the headquarters ($\hat{\alpha}_8$ = 0.010, s.e. = 0.010), and we see an average 0.1 percentage point decline in new hires following such a minimum wage change ($\hat{\alpha}_8$ = -0.010, s.e. = 0.004). This suggests that our estimated intensive margin employment responses are not driven by Brazilian establishments that experience more and/or larger headquarters minimum wage increases tending to employ workers of higher/lower turnover frequency (conditional on their observable characteristics).

headquarter wage increases to their to foreign establishments compress the occupational structure of their foreign establishments by removing positions. In contrast, employers that do not anchor wages to the headquarters and transmit wage changes abroad also do not change the occupational structure of their foreign establishments when wages rise at the headquarters. Evidence from Brazil suggests that adjustments such as these occur in parallel with changes in layoffs and new hiring.[63] We can only look at adjustments on the intensive margin of employment for the types of employers that tend to anchor wages to the headquarters. For such firms, we find that an increase in the home country or state minimum wage leads to an increase in layoffs of workers in low-skill positions and a decrease in new hiring in Brazilian establishments.

8 Conclusion

In this paper we show that many large multinationals use firm-wide wage-setting procedures that are not adjusted to local labor market conditions. Multinationals that are headquartered in inequality-averse countries anchor the wages they pay domestic workers in a given occupation at their foreign establishments to the wages they pay workers in the same occupation in the home country. They do so across the occupational skill range—including for low-skill support staff—and transmit wage increases externally imposed on the headquarters (via changes in the home country's minimum wage or exchange rate) to their foreign establishments. Multinationals headquartered in less inequality-averse countries do not anchor their wages abroad to headquarter levels.

We take a first step toward understanding the employment consequences of across-country wage compression in multinationals. We do so by showing how firms that anchor wages to the headquarters adjust the extensive and intensive margin of employment at their foreign establishments when permanent wage increases are externally imposed on the headquarters. Such firms compress the occupational structure of their foreign establishments by removing positions, lay off more workers in low-skill positions, and hire fewer new workers. Multinationals that that do not anchor wages abroad to the headquarters also do not change the occupational structure of their foreign establishments when wage increases are externally imposed on the headquarters.

Our results point toward the existence of consequential "wage cultures", which may contribute also to phenomena such as the acyclicality of wages and lack of delegation to establishments outside

[63] The results in Table 8 suggest that, even in multinationals that tend to make use of firm-wide wage-setting procedures—in particular those headquartered in inequality-averse countries, hiring decisions in foreign establishments may primarily be made locally. This is consistent with Bloom *et al.* (2012b) who find a positive relationship between home country inequality aversion as measured by Hofstede (2001) and a firm's decentralization of decision-making, including hiring decisions. In particular, Bloom *et al.* (2012b) show a positive correlation between home country inequality aversion and a composite measure of decentralization of capital investment, hiring, product introduction, and marketing decisions. We replicate their exercise and find that the relationship also holds when we focus on the measure of hiring decentralization. Unfortunately the World Management Survey used in Bloom *et al.* (2012b) does not contain measures of decentralization of wage-setting decisions.

of firms' home region (see e.g. Lemieux *et al.* , 2012; Aghion *et al.* , 2017).

References

AARONSON, DANIEL, & FRENCH, ERIC. 2007. Product Market Evidence on the Employment Effects of the Minimum Wage. *Journal of Labor economics*, **25**(1), 167–200.

AARONSON, DANIEL, & PHELAN, BRIAN J. 2017. Wage Shocks and the Technological Substitution of Low-wage Jobs. *The Economic Journal*, **129**(617), 1–34.

ABOWD, JOHN M., KRAMARZ, FRANCIS, & MARGOLIS, DAVID. 1999. High Wage Workers and High Wage Firms. *Econometrica*, **67**, 251–333.

ABOWD, JOHN M., CREECY, ROBERT H., & KRAMARZ, FRANCIS. 2002. *Computing Person and Firm Effects Using Linked Longitudinal Employer-Employee Data*. Census Bureau Technical Paper TP-2002-06.

ADAMS, BRIAN, & WILLIAMS, KEVIN R. 2019. Zone Pricing in Retail Oligopoly. *American Economic Journal: Microeconomics*, **11**(1), 124–56.

AGHION, PHILIPPE, BLOOM, NICK, LUCKING, BRIAN, SADUN, RAFFAELLA, & VAN REENEN, JOHN. 2017. *Turbulence and Decentralization in Bad Times*. CEP Discussion Paper No. 1479.

AITKEN, BRIAN, HARRISON, ANN, & LIPSEY, ROBERT E. 1996. Wages and Foreign Ownership: A Comparative Study of Mexico, Venezuela, and the United States. *Journal of International Economics*, **40**(3-4), 345–371.

AKERLOF, GEORGE, & YELLEN, JANET. 1990. The Fair-wage Effort Hypothesis and Unemployment. *The Quarterly Journal of Economics*, **105**(2), 255–283.

AKERLOF, GEORGE A., & KRANTON, RACHEL E. 2005. Identity and the Economics of Organizations. *Journal of Economic Perspectives*, **19**(1), 9–32.

ALFARO-URENA, ALONSO, MANELICI, ISABELA, & VASQUEZ, JOSE P. 2019. *The Effects of Multinationals on Workers: Evidence from Costa Rica*. Mimeo Universidad de Costa Rica.

ANGRIST, JOSHUA D, & KRUEGER, ALAN B. 1992. The effect of age at school entry on educational attainment: an application of instrumental variables with moments from two samples. *Journal of the American statistical Association*, **87**(418), 328–336.

AUTOR, DAVID H, & DORN, DAVID. 2013. The growth of low-skill service jobs and the polarization of the US labor market. *American Economic Review*, **103**(5), 1553–97.

AUTOR, DAVID H., MANNING, ALAN, & SMITH, CHRISTOPHER L. 2016. The Contribution of the Minimum Wage to US Wage Inequality over Three Decades: A Reassessment. *American Economic Journal: Applied Economics*, **8**(1), 58–99.

BANDIERA, ORIANA, DAHLSTRAND-RUDIN, AMANDA, & FISCHER, GREG. 2019. *Culture and Incentives*. Mimeo LSE.

BARTH, ERLING, BRYSON, ALEX, DAVIS, JAMES C, & FREEMAN, RICHARD. 2016. It's Where You Work: Increases in Earnings Dispersion Across Establishments and Individuals in the U.S. *Journal of Labor Economics*, **34**(S2), S67–S97.

BASKAYA, YUSUF SONER, & RUBINSTEIN, YONA. 2015. Using federal minimum wages to identify the impact of minimum wages on employment and earnings across the US states. mimeo LSE.

BLADER, STEVE, GARTENBERG, CLAUDINE, & PRAT, ANDREA. forthcoming. The Contingent Effect of Management Practices. *Review of Economic Studies*.

BLINDER, ALAN S, & KRUEGER, ALAN B. 2013. Alternative measures of offshorability: a survey approach. *Journal of Labor Economics*, **31**(S1), S97–S128.

BLOOM, N., SADUN, R., & REENEN, J. VAN. 2012a. Americans Do IT Better: U.S. Multinationals and the Productivity Miracle. *American Economic Review*, **102**(1), 167–201.

BLOOM, NICHOLAS, & VAN REENEN, JOHN. 2007. Measuring and Explaining Management Practices Across Firms and Countries. *The Quarterly Journal of Economics*, **122**(4), 1351–1408.

BLOOM, NICHOLAS, SADUN, RAFFAELLA, & VAN REENEN, JOHN. 2012b. The organization of firms across countries. *The Quarterly Journal of Economics*, **127**(4), 1663–1705.

BLOOM, NICHOLAS, SONG, JAE, PRICE, DAVID, GUVENEN, FATIH, & VON WACHTER, TILL. 2018. Firming up inequality. *The Quarterly Journal of Economics*, **134**(1), 1–50.

BOEHM, CHRISTOPH E., FLAAEN, AARON, & PANDALAI-NAYAR, NITYA. 2019. Input Linkages and the Transmission of Shocks: Firm Level Evidence from the 2011 Tohoku Earthquake. *Review of Economics and Statistics*, **101**(1), 60–75.

BOERI, TITO, ICHINO, ANDREA, MORETTI, ENRICO, & POSCH, JOHANNA. 2018. *National Wage Equalization and Regional Misallocation: Evidence from Italian and German Provinces*. Mimeo Universita Bocconi.

BREZA, EMILY, KAUR, SUPREET, & SHAMDASANI, YOGITA. 2017. The Morale Effects of Pay Inequality. *The Quarterly Journal of Economics*, **133**(2), 611–663.

BROWN, DRUSILLA K., DEARDORFF, ALAN, & STERN, ROBERT. 2004. The Effects of Multinational Production on Wages and Working Conditions in Developing Countries. *In:* BALDWIN, ROBERT E., & WINTERS, L. ALAN (eds), *Challenges to Globalization: Analyzing the Economics*. University of Chicago Press.

BUDD, JOHN W., KONINGS, JOZEF, & SLAUGHTER, MATTHEW J. 2005. Wages and International Rent Sharing in Multinational Firms. *Review of Economics and Statistics*, **87**(1), 73–84.

CAMPA, JOSE MANUEL, & GOLDBERG, LINDA S. 2001. Employment versus wage adjustment and the US dollar. *Review of Economics and Statistics*, **83**(3), 477–489.

CAPPELLI, PETER, & CHAUVIN, KEITH. 1991. An Interplant Test of the Efficiency Wage Hypothesis. *Quarterly Journal of Economics*, **106**(3), 769–797.

CARD, D., MAS, A., MORETTI, E., & SAEZ, E. 2012. Inequality at work: The effect of peer salaries on job satisfaction. *American Economic Review*, **102**(6), 2981–3003.

CARD, DAVID, & KRUEGER, ALAN B. 1995. *Myth and measurement: the new economics of the minimum wage*. New Jersey: Princeton University Press.

CARD, DAVID, HEINING, JÖRG, & KLINE, PATRICK. 2013. Workplace Heterogeneity and the Rise of West German Wage Inequality. *The Quarterly Journal of Economics*, **128**(3), 967–1015.

CARD, DAVID, CARDOSO, ANA RUTE, & KLINE, PATRICK. 2015. Bargaining, sorting, and the gender wage gap: Quantifying the impact of firms on the relative pay of women. *The Quarterly Journal of Economics*, **131**(2), 633–686.

CARD, DAVID, CARDOSO, ANA RUTE, HEINING, JOERG, & KLINE, PATRICK. 2018. Firms and Labor Market Inequality: Evidence and Some Theory. *Journal of Labor Economics*, **36**(S1), S13–S70.

CENGIZ, DORUK, DUBE, ARINDRAJIT, LINDNER, ATTILA, & ZIPPERER, BEN. 2019. The effect of minimum wages on low-wage jobs: Evidence from the United States using a bunching estimator. *The Quarterly Journal of Economics*, **134**(3), 1405–1454.

CLEMENS, JEFFREY, & GOTTLIEB, JOSHUA D. 2017. In the Shadow of a Giant: Medicare's Influence on Private Physician Payment. *Journal of Political Economy*, **125**(1), 1–39.

CLEMENS, MICHAEL A., MONTENEGRO, CLAUDIO, & PRITCHETT, LANT. 2019. The Place Premium: Bounding the Price Equivalent of Migration Barriers. *Review of Economics and Statistics*, **101**(2), 201–2013.

CONYON, MARTIN J., GIRMA, SOURAFEL, THOMPSON, STEVE, & WRIGHT, PETER W. 2002. The Productivity and Wage Effects of Foreign Acquisition in the United Kingdom. *The Journal of Industrial Economics*, **50**(1), 85–102.

CULLEN, Z., & PEREZ-TRUGLIA, R. 2018. *How Much Does Your Boss Make? The Effects of Salary Comparisons*. NBER Working Paper No. 24841.

CULPEPPER AND ASSOCIATES INC. 2011. *Geographic Pay Differentials: Practices in Managing Pay Between Locations*.

DE ROCHAMBEAU, GOLVINE. 2019. *Monitoring and Intrinsic Motivation: Evidence from Liberia's Trucking Firms*. Mimeo Sciences Po.

DELLAVIGNA, STEFANO, & GENTZKOW, MATTHEW. 2019. Uniform Pricing in US Retail Chains. *The Quarterly Journal of Economics*, **134**(4), 2011–2084.

DICKENS, WT, & KATZ, LF. 1987. Interindustry Wage Differences and Industry Characteristics. *In:* K, LANG, & J, LEONARD (eds), *Unemployment and the Structure of Labor Markets*. Blackwell.

DRACA, MIRKO, MACHIN, STEPHEN, & VAN REENEN, JOHN. 2011. Minimum Wages and Profitability. *American Economic Journal: Applied Economics*, **3**(1), 129–51.

DUBE, ARINDRAJIT, & KAPLAN, ETHAN. 2010. Does Outsourcing Reduce Wages in the Low-Wage Service Occupations? Evidence from Janitors and Guards. *ILR Review*, **63**(2), 287–306.

DUBE, ARINDRAJIT, GIULIANO, LAURA, & LEONARD, JONATHAN. 2019. Fairness and Frictions: Impact of Unequal Raises on Quit Behavior. *American Economic Review*, **109**(2), 620–63.

EARLE, JOHN S., TELEGDY, ALMOS, & ANTAL, GABOR. 2018. Foreign Ownership and Wages: Evidence from Hungary, 1986-2008. *ILR Review*, **71**(2), 458–491.

EGGER, HARTMUT, & KREICKEMEIER, UDO. 2013. Why Foreign Ownership May Be Good For You. *International Economic Review*, **54**(2), 693–716.

ENGBOM, NIKLAS, & MOSER, CHRISTIAN. 2018. *Earnings inequality and the minimum wage: Evidence from Brazil*. Federal Reserve Bank of Minneapolis-Opportunity and Inclusive Growth Institute Working Paper.

FALK, A., & KOSFELD, M. 2006. The Hidden Cost of Control. *American Economic Review*, **96**(5), 1611–1630.

FALK, A., BECKER, A., DOHMEN, T., ENKE, B., HUFFMAN, D., & SUNDE, U. 2018. Global Evidence on Economic Preferences. *The Quarterly Journal of Economics*, **133**(4), 1645–1692.

FEENSTRA, ROBERT C., & HANSON, GORDON H. 1996. Foreign Investment, outsourcing and relative wages. *Chap. 6, pages 89–128 of:* GROSSMAN, GENE M., & IRWIN, DOUGLAS A. (eds), *The Political economy of trade policy:*

essays in honor of Jagdish Bhagwati. MIT Press.

FEHR, ERNST, & SCHMIDT, KLAUS M. 1999. A Theory of Fairness, Competition, and Cooperation. *The Quarterly Journal of Economics*, **114**(3), 817–868.

GARTENBERG, CLAUDINE, & WULF, JULIE. forthcoming. Competition and Pay Inequality Within and Across Firms. *Management Science*.

GIROUD, X., & MUELLER, H. 2019. Firms' Internal Networks and Local Economic Shocks. *American Economic Review*, **109**(10), 3617–49.

GIROUD, X., & RAUH, J. 2019. State Taxation and the Reallocation of Business Activity: Evidence from Establishment-Level Data. *Journal of Political Economy*, **127**(3), 1262–1316.

GOLDBERG, LINDA, & TRACY, JOSEPH. 2001. *Exchange rates and wages*. NBER Working Paper No. 8137.

GOLDSCHMIDT, DEBORAH, & SCHMIEDER, JOHANNES F. 2017. The rise of domestic outsourcing and the evolution of the German wage structure. *The Quarterly Journal of Economics*, **132**(3), 1165–1217.

GOPINATH, GITA, ITSKHOKI, OLEG, & RIGOBON, ROBERTO. 2010. Currency choice and exchange rate pass-through. *American Economic Review*, **100**(1), 304–36.

GORODNICHENKO, Y., & ROLAND, G. 2011. Which Dimensions of Culture Matter for Long-Run Growth? *American Economic Review: Papers and Proceedings*, **101**(3), 492–98.

GRILICHES, ZVI, & HAUSMAN, JERRY A. 1986. Errors in variables in panel data. *Journal of econometrics*, **31**(1), 93–118.

GROSSMAN, GENE M., & HELPMAN, ELHANAN. 2007. *Fair wages and foreign sourcing*. Mimeo Princeton University.

GUISO, LUIGI, SAPIENZA, PAOLA, & ZINGALES, LUIGI. 2015. The Value of Corporate Culture. *Journal of Financial Economics*, **117**(1), 60–76.

HAANWINCKEL, DANIEL. 2019. *Supply, Demand, Institutions, and Firms: A Theory of Labor Market Sorting and the Wage Distribution*. Mimeo U.C. Berkeley.

HARASZTOSI, PÉTER, & LINDNER, ATTILA. 2019. Who Pays for the Minimum Wage? *American Economic Review*, **109**(8), 2693–2727.

HARRISON, A, & SCORSE, J. 2010. Multinationals and anti-sweatshop activism. *American Economic Review*, **100**(1), 247–73.

HEAD, KEITH, & MAYER, THIERRY. 2014. Gravity equations: Workhorse, toolkit, and cookbook. *Pages 131–195 of: Handbook of international economics*, vol. 4. Elsevier.

HELPMAN, ELHANAN, ITSKHOKI, OLEG, & REDDING, STEPHEN. 2013. Trade and Labor Market Outcomes. *Advances in Economics and Econometrics, Tenth World Congress, Volume II, Applied Economic*, 459–504.

HERMALIN, BENJAMIN E. 2013. Leadership and Corporate Culture. *Pages 432–476 of:* GIBBONS, R., & ROBERTS, J. (eds), *Handbook of Organizational Economics*. Princeton University Press.

HIJZEN, ALEXANDER, S.MARTINS, PEDRO, SCHANK, THORSTEN, & UPWARD, RICHARD. 2013. Foreign-owned firms around the world: A comparative analysis of wages and employment at the micro-level. *European Economic Review*, **60**, 170–188.

HJORT, JONAS, MALMBERG, HANNES, & SCHOELLMAN, TODD. 2019. *The Missing Middle Managers: Labor Costs, Firm Structure, and Development*. Mimeo Columbia University.

HOFSTEDE, GEERT. 1991. *Cultures and Organizations: Software of the Mind*. McGraw-Hill.

HOFSTEDE, GEERT. 2001. *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations across Nations*. 2nd edn. Thousand Oaks, California: Sage Publications, Inc.

HORTON, JOHN J. 2018. *Price Floors and Employer Preferences: Evidence from a Minimum Wage Experiment*. Mimeo MIT.

INOUE, ATSUSHI, & SOLON, GARY. 2010. Two-sample instrumental variables estimators. *The Review of Economics and Statistics*, **92**(3), 557–561.

KAHNEMAN, D., KNETSCH, J. L., & THALER, R. 1986. Fairness as a constraint on profit seeking: Entitlements in the market. *American Economic Review*, **76**(4), 728–741.

KAUR, SUPREET. 2019. Nominal wage rigidity in village labor markets. *American Economic Review*, **109**(10), 3585–3616.

KRUEGER, ALAN, & SUMMERS, LAWRENCE. 1988. Efficiency Wages and the Inter-Industry Wage Structure. *Econometrica*, **56**(2), 259–293.

LEE, DAVID S. 1999. Wage Inequality in The United States During The 1980s: Rising Dispersion Or Falling Minimum Wage? *The Quarterly Journal of Economics*, **114**(3), 977–1023.

LEMIEUX, THOMAS, MACLEOD, W. BENTLEY, & PARENT, DANIEL. 2009. Performance Pay And Wage Inequality. *The Quarterly Journal of Economics*, **124**(1), 1–49.

LEMIEUX, THOMAS, MACLEOD, W. BENTLEY, & PARENT, DANIEL. 2012. Contract Form, Wage Flexibility, and

Employment. *American Economic Review: Papers and Proceedings*, **102**(3), 526–31.

LEVIN, JONATHAN. 2002. Multilateral Contracting and the Employment Relationship. *Quarterly Journal of Economics*, **117**(3), 1075–1103.

LIPSEY, RE, & SJOHOLM, F. 2006. Foreign firms and Indonesian manufacturing wages: An analysis with panel data. *Economic Development and Cultural Change*, **55**(1), 201–221.

LIPSEY, ROBERT E. 2004. *Challenges to Globalization: Analyzing the Economics*. University of Chicago Press.

LORDAN, GRACE, & NEUMARK, DAVID. 2018. People versus machines: The impact of minimum wages on automatable jobs. *Labour Economics*, **52**, 40–53.

MARTINEZ, ELIZABETH A, BEAULIEU, NANCY, GIBBONS, ROBERT, PRONOVOST, PETER, & WANG, THOMAS. 2015. Organizational culture and performance. *American Economic Review*, **105**(5), 331–35.

MARTINS, PEDRO S, & ESTEVES, LUIZ A. 2015. Foreign Ownership, Employment and Wages in Brazil: Evidence from Acquisitions, Divestments and Job Movers. *Technology and Investment*, **6**(01), 22–45.

MARTINS, PEDRO S., & YANG, YONG. 2015. Globalised labour markets? International rent sharing across 47 countries. *British Journal of Industrial Relations*, **53**(4), 664–691.

MAS, ALEXANDRE. 2017. Does Transparency Lead to Pay Compression? *Journal of Political Economy*, **125**(5), 1683–1721.

MISHRA, PRACHI, & SPILIMBERGO, ANTONIO. 2011. Exchange rates and wages in an integrated world. *American Economic Journal: Macroeconomics*, **3**(4), 53–84.

MORETTI, ENRICO. 2011. Local Labor Markets. *In:* ASHENFELTER, ORLEY, & CARD, DAVID (eds), *Handbook of Labor Economics*. Elsevier.

MUENDLER, MARC-ANDREAS, POOLE, JENNIFER, RAMEY, GAREY, & WAJNBERG, TAMARA. 2004. Job Concordances for Brazil: Mapping the Classificação Brasileira de Ocupações (CBO) to the International Standard Classification of Occupations (ISCO-88). 01.

NATIONAL EMPLOYMENT LAW PROJECT. 2016. *Fight for $15: Four Years, $62 Billion*. "https://www.nelp.org/wp-content/uploads/Fight-for-15-Four-Years-62-Billion-in-Raises.pdf".

NEUMARK, DAVID. 2018. The Employment Effects Of Minimum Wages: Some Questions We Need To Answer. *In:* HAMILTON, JONATHAN, DIXIT, AVINASH, EDWARDS, SEBASTIAN, & JUDD, KENNETH (eds), *Oxford Research Encyclopedia of Economics and Finance*. Oxford, UK: Oxford University Press.

NEUMARK, DAVID, & WASCHER, WILLIAM. 1992. Employment effects of minimum and subminimum wages: panel data on state minimum wage laws. *ILR Review*, **46**(1), 55–81.

OREFICE, GIANLUCA, SLY, NICHOLAS, & TOUBAL, FARID. 2016. *The Multinational Wage Premium and Wage Dynamics*. The Federal Reserve Bank of Kansas City Research Working Paper 16.10.

PACINI, DAVID, & WINDMEIJER, FRANK. 2016. Robust inference for the Two-Sample 2SLS estimator. *Economics letters*, **146**, 50–54.

PROPPER, CAROL, & REENEN, JOHN VAN. 2010. Can Pay Regulation Kill? Panel Data Evidence on the Effect of Labor Markets on Hospital Performance. *Journal of Political Economy*, **118**(2), 222–273.

RABIN, MATTHEW. 1998. Psychology and Economics. *Journal of Economic Literature*, **36**(1), 11–46.

REES, ALBERT, & SCHULTZ, GEORGE. 1970. Workers in an Urban Labor Market. University of Chicago Press.

SETZLER, BRADLEY, & TINTELNOT, FELIX. 2019. *The Effects of Foreign Multinationals on Workers and Firms in the United States*. NBER Working Paper No. 26149.

SLICHTER, SUMNER. 1950. Notes on the Structure of Wages. *Review of Economics and Statistics*, **32**(1), 80–91.

SUN, CHANG. 2018. *Multinational Production with Non-neutral Technologies*. Mimeo University of Hong Kong.

TABELLINI, G. 2010. Culture and Institutions: Economic Development in the Regions of Europe. *Journal of the European Economic Association*, **8**(4), 677–716.

TEULINGS, C. N. 2003. The Contribution Of Minimum Wages To Increasing Wage Inequality. *Economic Journal*, **113**(490), 801–833.

TIMMER, MARCEL P, DIETZENBACHER, ERIK, LOS, BART, STEHRER, ROBERT, & DE VRIES, GAAITZEN J. 2015. An illustrated user guide to the world input–output database: the case of global automotive production. *Review of International Economics*, **23**(3), 575–605.

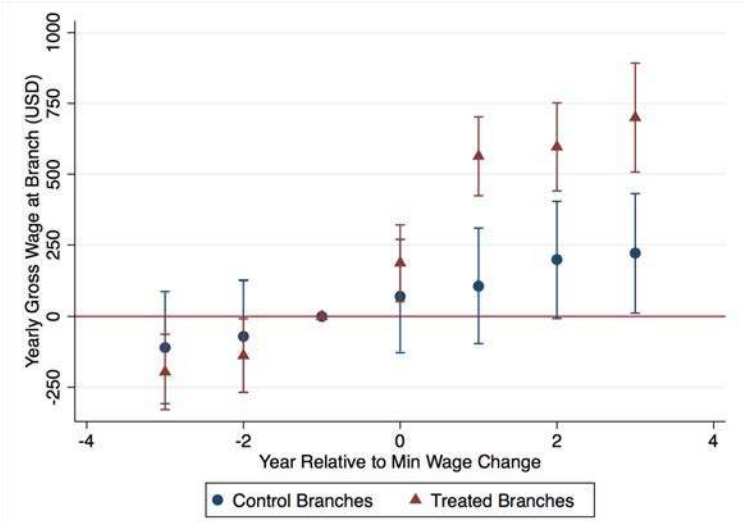
VAGHUL, KAVYA, & ZIPPERER, BEN. 2016. Historical state and sub-state minimum wage data. *Washington Center for Equitable Growth*.

VAN REENEN, JOHN. 1996. The Creation and Capture of Rents: Wages and Innovation in a Panel of U.K. Companies. *The Quarterly Journal of Economics*, **111**(1), 195–226.

YOO, B N, DONTHU, Y, & LENARTOWICZ, T. 2011. Measuring Hofstede's five dimensions of cultural values at the individual level: Development and validation of cvscale. *Journal of International Consumer Marketing*, **23**(3-4), 193–210.

FIGURES

FIGURE 1: IMPACT OF HQ MIN WAGE ON FOREIGN ESTAB. WAGES



Note: This event study plots the coefficients from a regression in which occupation-specific establishment wages are regressed on year dummies. A minimum wage shock in the HQ occurs in $t = 0$. All coefficients are plotted relative to the average wage in the establishment in $t = -1$ (the year before the shock). A treated establishment is an establishment in country c whose HQ experienced a minimum wage shock. Control establishments are other firms' establishments in city c in the same sector s for which the HQ did not experience a minimum wage shock. The average wage in $k = -1$ is 9,982.68 in the treated establishments and 11,164.20 in the control establishments.

TABLES

TABLE 1: SUMMARY STATISTICS OF MULTINATIONALS

Panel A: Summary of Multinational Samples

Unit of Observation	*# Obs*			*Analysis*
	Sample 1	*Sample 2*	*Sample 3*	i) Estab.-HQ wage correlation (Section 3)
Employer	1,060	91	74	ii) Impacts at foreign establishments of external HQ
Employer×year	3,823	456	156	wage shifters (minimum wage increases & ex. rate shocks):
Establishment	5,783	1,184	618	ii.a) wage (sections 4 - 6); ii.b) employment (Section 7)
Estab.×year	19,172	5,006	1,178	*Sample 3* (panel) in i) [robust]
Estab.×skill-level×year	159,602	40,792	9,315	*Sample 3* (panel) in i) [robust]
Estab.×occupation	136,160	18,065	10,797	*Sample 2* (cross-sectional) in i) [robust]
Estab.×occ.×year	398,224	79,130	20,739	*Sample 3* (panel) in i) [main], ii.a) [robust] *Sample 2* (imputed estab./HQ panel) in i) [robust], ii.a) [robust] *Sample 1* (panel) in ii.a) [main], ii.b)

Panel B: Multinationals' Foreign Establishments' Wages & Occupation Structure

	Sample 1		*Sample 2*		*Sample 3*	
	Mean	SD	Mean	SD	Mean	SD
	(1)	(2)	(3)	(4)	(5)	(6)
Net Wage (2005 USD)	18,511.65	12,889.23	18,615	12,459.49	23,927.01	15,227.02
# Foreign Establishments (per MNC×year)	5	13.72	11.17	24.1	7.54	18.22
# Foreign Estab Occupations (per MNC×year)	24.91	15.44	31.08	17.25	27.4	12.99
# Foreign Estab Skill Levels (per MNC×year)	8.63	2.48	9.8	2.25	9.46	2.15

Panel C: Distribution & Compression of Wages (Sample 3)

	HQ-Quart1	HQ-Quart2	HQ-Quart3	HQ-Quart4	HQ-All Occ
	(1)	(2)	(3)	(4)	(5)
Headquarter Wage Distribution					
Mean Net Wage (2005 USD)	12,942.99	21,176.66	33,562.59	51,182.83	27,734.54
Establishment Wage as % of HQ Wage					
All Establishments	0.867	0.859	0.901	0.886	0.877
Estab.s in Poorer-than-HQ-Country Countries	0.735	0.748	0.792	0.809	0.767
# Obs (Employer×Occ.×Year)	812	636	624	535	2,607

Panel D: Decomposition of Log Wage Variation

	Sample 1	*Sample 2*	*Sample 3*	*Sample 1*	*Sample 2*	*Sample 3*
Total Variation	*Raw estab.×occ×year log wage*			*Adjusted for sector, city and occ. FEs*		
	(1)	(2)	(3)	(4)	(5)	(6)
Total Variance	0.771	0.833	0.764	0.205	0.243	0.224
Across employers (%)	21.6%	24.8%	19.0%	42.7%	52.5%	43.5%
W/in employer, across estab.s (%)	23.7%	20.8%	16.5%	25.7%	23.1%	23.2%
W/in estab., across occupations (%)	51.7%	51.9%	60.2%	20.1%	15.8%	21.4%
W/in estab.×occ, across years (%)	2.9%	2.5%	4.3%	11.5%	8.6%	11.9%

Panel A summarizes the 3 main samples of multinationals and how they are used in the empirical analysis. Sample 1 consists of the full sample of multinationals for which we have wage data from at least one foreign establishment; Sample 2 consists of employers for which we observe at least one job in the headquarters and at least one foreign establishment; Sample 3 consists of employers for which we observe at least one job in the headquarters and at least one foreign establishment in the same year. The sample sizes include only foreign establishments. Occupations refer to the job titles recorded by the Company (298 job titles in total); skill levels are defined globally by the Company (16 levels in total). In Panel B, the numbers are calculated over all foreign establishments of a given multinational in a given year. Wages are measured in 2005 USD. Outlier observations with average establishment×year annual net wage below 1,000 USD or above 500,000 USD are dropped. Panel C focuses on Sample 3, and only occupations that are observed in both the headquarters and at least one foreign establishment within the same year are included. We first show the average net wages within each quartile at an employer's headquarters in a given year. We then show the average wage in the firm's establishments as a share of headquarter wages for each quartile."Establishments in poorer-than-HQ-country countries" means we only include establishments which are located in countries with lower GDP per capita than the home country. Panel D presents the variance decomposition results of (log) employment-establishment-occupation-year specific wages for the 3 samples of multinationals. Observations of the headquarters (when available) are included.

TABLE 2: RELATIONSHIP BETWEEN HQ AND FOREIGN ESTABLISHMENT WAGES

Sample	*Sample 3* MNEs w/ estab.-HQ match w/in occ×year			*Sample 2* MNEs w/ estab.-HQ match w/in occ	
Unit of Observation	estab×occ×yr	estab×skill-lev×yr	estab×yr	estab×occ	estab×occ×yr
Data Structure	Panel	Panel	Panel	Cross-sectional	Panel (Imputed Estab. Panel)
Dep. Var.	Log Wage at Foreign Establishment				
	Panel A: Local Benchmark Wage Control				
	(1)	(2)	(3)	(4)	(5)
Log HQ Wage	0.153**	0.121*	0.372***	0.324***	0.480***
	(0.048)	(0.062)	(0.065)	(0.072)	(0.109)
Log Local Benchmark Wage	0.137***	0.212***		0.307***	0.008*
	(0.040)	(0.034)		(0.046)	(0.004)
Employer×Occ FE	Y				
Employer×Skill-level FE		Y			
Employer FE			Y	Y	Y
Estab.-City×Year FE	Y	Y	Y		Y
Occ FE				Y	Y
Estab.-City FE				Y	
Observations	19,520	9,241	1,274	17,850	31,751
	Panel B: Estab.-city×Occupation×Year Fixed Effects				
	(1)	(2)	(3)	(4)	(5)
Log HQ Wage	0.157***	0.266***	0.372***	0.280***	0.482***
	(0.048)	(0.090)	(0.065)	(0.068)	(0.041)
Employer×Occ FE	Y				
Employer×Skill-level FE		Y			
Employer FE			Y	Y	Y
Estab.-City×Year FE			Y		
Estab.-City×Occ×Year FE	Y				Y
Estab.-City×Skill-level×Year FE		Y			
Estab.-City×Occ FE				Y	
Observations	19,520	9,246	1,274	17,850	38,268

Note: This table shows the correlation between a firm's wage levels at its headquarters and its foreign establishments. The outcome variables are the occupation-specific log wage at an establishment in a given year (column 1 & 5), the skill-level-specific log wage at an establishment in a given year (Column 2), the average log wage at an establishment in a given year (Column 3), and the time-adjusted cross-sectional average occupation-specific log wage at an establishment (Column 4). In Column 5, the missing values in panel of the dependent variable (the occupation-specific log wage at the foreign stablishments) are imputed as the sum of an establishment×occupation component and an establishment-city×occupation×year component, which are estimated from a two-way fixed effect model on the unbalanced panel of observable occupation-specific foreign establishment wages. In Column 2 of Table 2 where the outcome variable is skill-level-specific establishment wages in a given year, the corresponding local benchmark control becomes the average wage of workers in skill level l employed by all the other firms in our sample in foreign city c in year t (Panel A), and city×skill-level×year fixed effects (Panel B). In column 3 of Table 2 where the outome variable is average establishment wage in a given year, the corresponding controls are subsumed by city×year fixed effects θ_{ct}. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE 3: HETERO. HQ-ESTAB. WAGE CORRELATION BY HQ COUNTRY INEQUALITY AVERSION

	Panel A: Wage Level Anchoring					
	Log Occ-Specific Wage at Foreign Establishment					
	(1)	(2)	(3)	(4)	(5)	(6)
Log HQ Wage	0.160***	0.321***	0.315***	0.142***	0.168***	0.159***
	(0.057)	(0.072)	(0.070)	(0.055)	(0.032)	(0.032)
Log HQ Wage		-0.414*	-0.416*		-0.172	-0.165
× HQ-Country Low Ineq. Aversion		(0.253)	(0.253)		(0.137)	(0.137)
Log HQ Wage			0.007			0.010***
× Estab.-Country Low Ineq. Aversion			(0.016)			(0.001)
Log Local Benchmark Wage	0.151***	0.152***	0.152***			
	(0.037)	(0.037)	(0.037)			
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Estab.-City×Occ×Year FE	N	N	N	Y	Y	Y
Observations	17,753	17,753	17,751	17,757	17,757	17,755
	Panel B: Wage Slope Anchoring					
	Occ. Category-Specific Wage Slope at Foreign Establishment					
	(1)	(2)	(3)	(4)	(5)	(6)
HQ Wage Slope	0.110	0.292***	0.236***	0.109*	0.273***	0.298***
	(0.075)	(0.083)	(0.094)	(0.063)	(0.056)	(0.059)
HQ Wage Slope		-0.344***	-0.346***		-0.317***	-0.315***
× HQ-Country Low Ineq. Aversion		(0.100)	(0.100)		(0.077)	(0.077)
HQ Wage Slope			0.061			-0.027
× Estab.-Country Low Ineq. Aversion			(0.048)			(0.018)
Local Benchmark Wage Slope	0.032***	0.034***	0.033***			
	(0.012)	(0.012)	(0.012)			
Employer×Occ-Type×Skill Level-Pair FE	Y	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Estab.-City×Occ-Type×Skill Level-Pair×Year FE	N	N	N	Y	Y	Y
Observations	11,968	11,968	11,968	11,982	11,982	11,982

Note: Panel A shows the heterogeneous correlations between a firm's wage levels at its headquarters and its foreign establishments by the home country's inequality aversion. The outcome variables are the occupation-specific log wage at an establishment in a given year. In columns (2) and (5), we interact the main independent variable, the average wage at headquarters, with a binary variable indicating whether the home country is classified as having low inequality aversion according to the Hofstede measures of culture. If the variable "HQ-Country Low Ineq. Aversion" ("Estab.-Country Low Ineq. Aversion") equals one, it indicates that the home country (foreign establishment country) is more accepting of inequality than the average country in the sample. In columns (1)-(3), establishment city local occupation-specific benchmark wage controls are included; in columns (4) - (6), the local benchmark wage controls and the establishment-city×occupation×year fixed effects are replaced by establishment-city×occupation×year fixed effects. Panel B replicates Panel A, changing the outcome variable to a firm's within-occupation-type-between-skill-level wage slopes – the difference between the average log wage of jobs within each occupational category in consecutive skill levels at a foreign establishment. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE 4: IMPACT OF HQ MIN. WAGE CHANGE ON FIRM WAGES

	Low-Skill Occupations Only		
Sample	*Sample 3* (HQ-estab. match w/in occ×year)	*Sample 2* (HQ-estab. match w/in occ)	*Sample 1* (All MNCs)
Estimation Method	Same-sample 2SLS	Same-sample 2SLS (Imputed HQ Panel)	Two-sample 2SLS
	(1)	(2)	(3)
Panel A: Reduced form		%Δ Estab. Wage	
%Δ HQ Min Wage	0.058	0.058***	0.040**
	(0.042)	(0.011)	(0.016)
Panel B: First stage		%Δ HQ Wage	
%Δ HQ Min Wage	0.127***	0.162**	0.095**
	(0.019)	(0.081)	(0.044)
Panel C: IV (2SLS)		%Δ Estab. Wage	
%Δ HQ Wage (IVed)	0.457	0.360*	0.426*
	(0.345)	(0.196)	(0.246)
Employer×Occ FE	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y
Observations	1,872	14,743	57,026 (Panels A, C) 5,215 (Panel B)

Note: This table shows (1) the impact that a 100% minimum wage increase in a firm's home country has on gross wages paid to low-skill jobs in its foreign establishments (Panel A) and its headquarters (Panel B), and (2) the impact of minimum-wage-induced wage changes of a low-skill job in the headquarters on the wage changes of the same-occupation job in a foreign establishment of the same employer (Panel C). An occupation is low-skill if its skill level (defined globally by the Company, 16 skill levels in total) is between 1 and 5. In column 1, we perform standard same-sample 2SLS estimation. In column 2, we first impute the headquarter wages of a given job for missing years by linearly interpolating job-specific log headquarter wages on log home country minimum wages, and then perform standard same-sample 2SLS estimation. In column 3, we perform two-sample 2SLS by estimating the first stage using all low-skill jobs in all headquarters (including those for which we do not observe the same job in a foreign establishment in the same year), and the second stage & reduced form using low-skill jobs in all foreign establishments (including those for which we do not observe their headquarter counterparts in the same year). In the first stage estimation of column 3, we impose the restriction that the establishment-city×year fixed effects are the same for the same year, as there is no unique establishment city attached to each observation used in the first stage estimation. Outliers with wage changes larger than 50% are excluded. Standard errors are reported in parentheses and clustered at the home-country(state) level. TS2SLS standard errors are computed following Pacini & Windmeijer (2016). (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE 5: MIN. WAGE IMPACT ON BINDING VS NON-BINDING OCCUPATIONS/FIRMS

Panel A: Binding Occupations (v. Others)	%Δ Estab. Wage		%Δ HQ Wage	
w/in Establishment×Year	(1)	(2)	(3)	(4)
%Δ HQ Min Wage		0.016		-0.006
		(0.074)		(0.057)
%Δ HQ Min Wage × Occ. Binding	0.088***	0.082***	0.209***	0.263
	(0.029)	(0.032)	(0.096)	(0.166)
Employer×Occ FE	Y	Y	Y	Y
Year FE	N	N	N	Y
Estab.-City×Year FE	N	Y	N	N
Employer×Estab.×Year FE	Y	N	Y	N
Observations	7,803	7,803	2,447	2,327
R-squared	0.721	0.707	0.717	0.356
Panel B: Heterogeneity by Firm Bindingness	%Δ Estab. Wage		%Δ HQ Wage	
on Low-Skill Occ'n.s w/in HQ-Country×Year	(1)	(2)	(3)	(4)
%Δ HQ Min Wage		0.055		0.149
		(0.070)		(0.403)
%Δ HQ Min Wage ×Firm Bindingness	1.373***	1.118**	4.705***	4.172***
(sample median deviation of Kaitz)	(0.527)	(0.529)	(0.048)	(1.421)
Employer×Occ FE	Y	Y	Y	Y
Year FE	N	N	N	Y
Estab.-City×Year FE	Y	Y	N	N
HQ-City×Year FE	Y	N	Y	N
Observations	34,634	34,634	994	994
R-squared	0.472	0.447	0.825	0.825
Panel C: Heterogeneity by Firm Bindingness	%Δ Estab. Wage		%Δ HQ Wage	
on Binding Occ'n.s (v. Others) w/in HQ-Country×Year	(1)	(2)	(3)	(4)
%Δ HQ Min Wage		0.014		0.023
		(0.041)		(0.018)
%Δ HQ Min Wage×Occ. Binding	0.086	0.086	0.126***	0.147***
	(0.058)	(0.060)	(0.043)	(0.047)
%Δ HQ Min Wage×Occ. Binding	1.243***	1.190**	4.045**	4.306*
×Firm Bindingness (sample median deviation)	(0.404)	(0.403)	(1.929)	(2.333)
%Δ HQ Min Wage×Occ. Non-binding	0.896**	0.813**	3.864**	3.681*
×Firm Bindingness (sample median deviation)	(0.375)	(0.375)	(1.924)	(2.177)
Employer×Occ FE	Y	Y	Y	Y
Year FE	N	N	N	Y
Estab.-City×Year FE	Y	Y	N	N
HQ-City×Year FE	N	Y	N	Y
Observations	6,505	6,505	3,384	3,384
R-squared	0.712	0.711	0.801	0.355

Note: The outcome variable is the percent change in occupation-specific wages at the foreign establishments (cols 1 and 2) and the HQ (columns 3-4) of a multinational employer. Panel A shows the impact that a 100% minimum wage increase in a firm's HQ country has on gross wages for "binding" and "non-binding" occupations. The outcome variable is the percent change in occupation-specific establishment/HQ wages. An occupation is binding in a country if there exists a HQ or foreign establishment that, in the preceding year, paid a wage to that occupation that was below the new minimum wage. Only establishment-years in which at least one HQ-minimum-wage-binding occupation existed are included, as they are relevant in within-establishment-year analysis. Panel B shows the differential impact that a 100% minimum wage increase in a country has on gross wages paid to low-skill jobs of firms HQed in this country depending on how binding the minimum wage is for the HQs of these firms. An occupation is low-skill if its skill level (defined globally by the Company, 16 skill levels in total) is between 1 and 5. Firm-level minimum-wage-bindingness is measured by the ratio between the prevailing minimum wage and the median wage of the HQ (Kaitz index). For years in which the HQ was not surveyed, we impute the firm-level average Kaitz index. Only the firms of which the HQ and at least one foreign establishment are observed are included, as the Kaitz index is only available for these firms.Panel C shows the heterogeity by firm-level bindingness in the differential impact that a 100% minimum wage increase in a firm's HQ country has on gross wages paid to minimum-wage-binding occupations compared to unbinding ones within the same HQ country. Only establishment-years in which at least one HQ-minimum-wage-binding occupation existed are included. Outliers with percentage wage changes larger than 50% are excluded. Standard errors are reported in parentheses and clustered at the HQ-country(state) level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE 6: IMPACT OF HQ EX. RATE SHOCKS ON FIRM WAGES

Sample	*Sample 3* (HQ-estab. match w/in occ×year)	*Sample 2* (HQ-estab. match w/in occ)	*Sample 1* All MNCs	*Sample 1* All MNCs Appreciation	*Sample 1* All MNCs Depreciation
Estimation Method	Same-sample 2SLS	Same-sample 2SLS (Imputed HQ Panel)	Two-sample 2SLS	Two-sample 2SLS	Two-sample 2SLS
	(1)	(2)	(3)	(4)	(5)
Panel A: Reduced form			Log Estab. Wage		
Log HQ Ex. Rate	-0.148	-0.165*	-0.156***	-0.276***	-0.102**
	(0.372)	(0.100)	(0.040)	(0.070)	(0.051)
Panel B: First stage			Log HQ Wage		
Log HQ Ex. Rate	-0.558***	-0.523*	-0.705***	-0.665***	-0.700***
	(0.100)	(0.313)	(0.100)	(0.133)	(0.125)
Panel C: IV (2SLS)			Log Estab. Wage		
Log HQ Wage (IVed)	0.265	0.316	0.222**	0.415***	0.146*
	(0.668)	(0.273)	(0.065)	(0.134)	(0.077)
Employer×Occ FE	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y	Y
Observations	18,054	46,727	(Panels A, C) 267,301 (Panel B) 28,451	156,274 9,502	171,990 18,608

Note: This table shows (1) the impact that a 100% local currency depreciation (relative to USD) in a firm's home country has on gross wages (USD) in its foreign establishments (Panel A) and its headquarters (Panel B), and (2) the impact of exchange-rate-shock-induced wage changes (USD) of a job in the headquarters on the wage changes (USD) of the same-occupation job in a foreign establishment of the same employer (Panel C). In column 1, we perform standard same-sample 2SLS estimation. In column 2, we first impute the headquarter wages of a given job for missing years by linearly interpolating job-specific log headquarter wages on log home country exchange rate, and then perform standard same-sample 2SLS estimation. In columns 3-5, we perform two-sample 2SLS by estimating the first stage using all jobs in all headquarters (including those for which we do not observe the same job in a foreign establishment in the same year), and the second stage & reduced form using all jobs in all foreign establishments (including those for which we do not observe their headquarter counterparts in the same year). The results in column 3 are estimated using all exchange rate changes; those in column 4 are estimated using appreciation shocks; those in column 5 are estimated using depreciation shocks. In the first stage estimation of columns 3-5, we impose the restriction that the establishment-city×year fixed effects are the same for the same year, as there is no unique establishment city attached to each observation used in the first stage estimation. Exchange rates are detrended from home-country-specific time trends. All foreign establishments located in the same currency zone as the headquarters are excluded. Outliers with wage changes larger than 50% are excluded. Standard errors are reported in parentheses and clustered at the home-country-currency-zone level. TS2SLS standard errors are computed following Pacini & Windmeijer (2016). (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE 7: TRANSMISSION OF HQ COUNTRY SHOCKS AND HQ INEQUALITY-AVERSION

Panel A: HQ Country Minimum Wage Hikes		
Low-Skill Occupations	%Δ Estab. Wage	%Δ HQ Wage
	(1)	(2)
%Δ HQ Min Wage	0.085**	0.093***
× HQ-Country High Ineq. Aversion	(0.040)	(0.036)
%Δ HQ Min Wage	0.008	0.095*
× HQ-Country Low Ineq. Aversion	(0.012)	(0.059)
Employer×Occ FE	Y	Y
Year FE	N	Y
Estab.-City×Year FE	Y	N
Observations	57,012	5,215
Panel B: HQ Country Exchange Rate Shocks		
	Log Estab. Wage	Log HQ Wage
	(1)	(2)
Log HQ Ex. Rate	-0.196***	-0.743***
× HQ-Country High Ineq. Aversion	(0.054)	(0.152)
Log HQ Ex. Rate	-0.089	-0.691***
× HQ-Country Low Ineq. Aversion	(0.055)	(0.172)
Employer×Occ FE	Y	Y
Year FE	N	Y
Estab.-City×Year FE	Y	N
Observations	267,047	10,842

Note: Panel A shows the heterogeneity in the impact that a 100%minimum wage increase in a firm's home country has on gross wages paid to low-skill jobs in its foreign establishments (column 1) and its headquarters (column 2), depending on the home country's inequality aversion level.
Panel B shows the heterogeneity in the impact that a 100% local currency depreciation (relative to USD) in a firm's home country has on gross wages (USD) in its foreign establishments (column 1) and its headquarters (column 2), depending on the home country's inequality aversion level. Exchange rates are detrended from home-country-currency-zone-specific time trends.
All jobs in all foreign establishments and all headquarters are used in the estimation. Outliers with wage changes larger than 50% are excluded. Standard errors are reported in parentheses. In Panel A, standard errors are clustered at the home-country(state) level. In Panel B, standard errors are clustered at the home-country-currency-zone level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE 8: IMPACT OF HQ MIN. WAGE CHANGE ON FOREIGN ESTABLISHMENT EMPLOYMENT

	Panel A: Extensive Margin			
Data Source	the Company		*RAIS* (Brazil)	
Unit of Observation	estab×occ×year			
Dep. Var.	Occupation Leaves Foreign Establishment			
Sample	All Occ.	Low-Skill Occ.	All Occ.	
	(1)	(2)	(3)	(4)
%Δ HQ Min Wage	0.018*	0.026**	-0.050	-0.056
	(0.009)	(0.012)	(0.056)	(0.056)
%Δ HQ Min Wage	-0.022*	-0.019		
× HQ-Country Low Ineq. Aversion	(0.012)	(0.015)		
%Δ Min Wage at HQ				0.108
× Low Skill Occ.				(0.079)
Employer×Occ FE	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y
Mean Dep. Var.	0.042	0.086	0.058	Low-Skill: 0.068 Med/High-Skill: 0.006
Observations	169,841	105,545	35,059	35,059
	Panel B: Intensive Margin			
Data Source	*RAIS* (Brazil)			
Unit of Observation	estab×worker×yr			
Dep. Var.	Worker Laid Off		Worker Newly Hired	
	(1)	(2)	(3)	(4)
%Δ HQ Min Wage	0.008	-0.011	-0.010***	-0.010***
	(0.011)	(0.008)	(0.004)	(0.003)
%Δ HQ Min Wage		0.027**		-0.004
× Low-Skill Occ.		(0.010)		(0.006)
Employer×Occ FE	Y	Y	Y	Y
Employer FE	N	N	N	N
Estab.-City×Year FE	Y	Y	Y	Y
Worker Controls	Y	Y	Y	Y
Mean Dep. Var.	0.077	Low-Skill: 0.082 Med/High-Skill: 0.0662	0.052	Low-Skill: 0.118 Med/High-Skill: 0.072
Observations	1,320,842	1,320,842	1,320,842	1,320,842

Note: This table shows impact that a 100% minimum wage increase in a firm's home country has on the existence of occupations (Panel A) and the employment of workers (Panel B) at the firm's foreign establishments. In Panel A, the outcome variable is a dummy variable indicating that an occupation disappears from a given establishment in the following year. In columns 1 & 2, an occupation is a job title defined by the Company (298 in total); in columns 3 & 4, the coding of occupations follows the Brazilian Classification of Occupations (*CBO2002*). In Panel B, the outcome variable in columns 1 & 2 (3 & 4) is a dummy variable indicating that a worker is laid off (hired) in a given foreign establishment located in Brazil during the year following the minimum wage change. In columns 1-2 of Panel A, inequality aversion is defined according to the Hofstede measures of culture. If the variable "HQ-Country Low Ineq. Aversion" equals one, it indicates that the home country is more accepting of inequality than the average country in the sample of our main dataset. In Panel B and columns 3-4 of Panel A, almost all foreign establishments in Brazil in our sample are from multinationals headquartered in high inequality averse home countries. An occupation is low-skill if its skill level is between 1-5 (out of 16 skill levels). Standard errors are reported in parentheses and clustered at the home-country(state) level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE 9: ESTABLISHMENT-HQ WAGE ANCHORING: BRAZIL

Panel A: Relationship bet. HQ and Establishment Wages				
Log Estab. Wage	Annual	Contracted	Annual	Contracted
(Worker-Specific)	(1)	(2)	(3)	(4)
Log HQ Wage	0.142***	0.146***	0.091***	0.121***
(Skill-Level Specific)	(0.010)	(0.007)	(0.007)	(0.006)
Employer×Occ FE	Y	Y	N	N
Employer×Estab.×Occ.×Worker FE	N	N	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y
Worker Controls	Y	Y	Y	Y
Observations	57,062	44,763	15,873	20,785
Panel B: Impact of HQ Min. Wage Change on Establishment Wages				
%Δ Estab. Wage	Annual	Contracted	Annual	Contracted
(w/in Estab.×Occ.×Worker)	(1)	(2)	(3)	(4)
%Δ HQ Min Wage	0.082***	0.077***	0.078***	0.074***
×Low-Skill Occ.	(0.013)	(0.005)	(0.022)	(0.007)
%Δ HQ Min Wage	0.010***	0.009***	0.015*	0.004
×Med/High-Skill Occ.	(0.003)	(0.003)	(0.008)	(0.005)
Employer×Occ FE	Y	Y	N	N
Employer×Estab.×Occ.×Worker FE	N	N	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y
Worker Controls	Y	Y	Y	Y
Observations	225,922	373,226	157,981	331,617
Panel C: Impact of HQ Ex.Rate Shocks on Establishment Wages				
Log Estab. Wage	Annual	Contracted	Annual	Contracted
(Worker-Specific)	(1)	(2)	(3)	(4)
Log HQ Ex. Rate	-0.200**	-0.211***	-0.193***	-0.051**
	(0.027)	(0.059)	(0.057)	(0.025)
Employer×Occ FE	Y	Y	N	N
Employer×Estab.×Occ.×Worker FE	N	N	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y
Worker Controls	Y	Y	Y	Y
Observations	938,437	947,714	869,440	878,608

Note: In all specifications we also control for both time-varying and time-invariant worker characteristics including age, tenure, education, gender, race, disability status, etc. The coding of occupations follows the Brazilian Classification of Occupations (*CBO2002*). In *RAIS*, an occupation's skill level is defined using the average education of workers employed in the occupation, and the coding of skill levels is designed so that the skill level distribution in *RAIS* is matched to the skill level distribution in the main data set. In Panel A, headquarter wages are measured at skill-level level. An occupation is low-skill (middle-/high-skill) if its skill level (defined in *RAIS*) is between 1-5 (above 5). In columns 1 & 3, the outcome variables are log (or percentage change in) annual average monthly wage of a worker. In columns 2 & 4, the outcome variables are log (or percentage change in) contracted hourly wage of a worker. In columns 1 & 2, we control for employer×occupation fixed effects and establishment-city×year fixed effects, the same as the analysis conduced on the main data set. In columns 3 & 4, we in addition control for employer×establishment×occupation×worker fixed effects (i.e. workers' occupation-specific employment spell fixed effects). Standard errors are reported in parentheses. In Panel A, standard errors are clustered at the employer level. In Panel B, standard errors are clustered at the home-country(state) level. In Panel C, standard errors are clustered at the home-country-currency-zone level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

Appendix I Threats to identification: transmission of exchange rate shocks

1. Endogenous timing of exchange rate fluctuations A currency appreciation may take place when a country's economy is doing well and aggregate demand for labor is relatively high. If home country labor demand and multinationals' demand for labor abroad are correlated, a home country currency appreciation could then coincide with a rise in wages paid in foreign establishments absent any wage anchoring.

To investigate this concern, we first break down the estimated impact of home country exchange rate shocks by sectors' export and import shares. If the positive foreign wage response to an increase in the USD value of a home country's currency is driven by underlying labor demand shocks, the impact should be small among output-exporting firms—which are likely to directly suffer from an increase in the relative price of domestically-produced goods—and large among input-importing firms, which conversely are likely to directly benefit from an decrease in the relative price of their inputs. As seen in columns 1-3 of Panel A in Appendix Table A14, we find no evidence that wage impacts of home country exchange rate shocks in foreign establishments are driven by firms in high-import-share and low-export-share home country sectors.[64]

It is worth noting that a story in which labor demand covaries with exchange fluctuations and this explains the estimated impact of exchange rate shocks on multinationals' foreign wages is hard to reconcile also with the asymmetric response of foreign establishment wages to home country appreciation and depreciation shown in columns 4 & 5 of Table 6.[65]

The evidence thus suggests that that endogenous timing of exchange rate fluctuations is not the primary explanation for the estimated transmission of externally imposed headquarter wage increases to multinationals' foreign establishments.

2. Offshoring in response to home country currency appreciation A home country currency appreciation can make some multinationals' headquarter workers more expensive to employ relative to the firm's foreign establishment workers. This could induce the employer to shift jobs to foreign establishments from the headquarters—Feenstra & Hanson (1996) -offshoring—which could in turn raise wages both at home and abroad, contributing to the estimated impact of exchange rate shocks on multinationals' foreign wages.

For task reallocation within jobs to explain the results in Sub-section 5.1, the effect of home country exchange rate shocks on wages in foreign establishments would need to be concentrated in firms that engage in international trade (see e.g. Campa & Goldberg, 2001; Goldberg & Tracy, 2001).[66] Intuitively, if a firm's headquarters and foreign establishments buy from and sell to the domestic market of the country in which the relevant establishment is located, home country currency depreciation

[64] The country×sector specific input/output shares are calculated using data from the World Input-Output Database (WIOD) in year 2004 (Timmer *et al.* , 2015). We use a pre-sample-period measure to avoid potentially confounding changes in the share of imported inputs/exported outputs, which might be endogenous to exchange rate changes. Note that we do not show heterogeneity in the estimated effect by input/output tradability in the minimum wage analysis in Section 4 because a home country/state minimum wage increase presumably leads to a similar increase in the relative price of headquarter labor compared to foreign labor in firms that sell in the international versus domestic markets. Nonetheless, we find no evidence of such heterogeneity in the minimum wage impact (results available from the authors upon request).

[65] Endogenous labor demand could explain this asymmetry only if labor demand shocks at the headquarter are equally correlated with home country exchange rate changes under appreciation and depreciation, while the shocks that coincide with appreciation are 2.7 times as correlated with multinationals' demand for labor abroad than those associated with depreciation. This is rather improbable, especially compared to the natural downward-nominal-wage-rigidity/wage anchoring explanation for the asymmetry discussed in Sub-section 5.1.

[66] The within-employer labor in-sourcing explanation has the same prediction as the endogenous labor demand explanation in terms of the wage impact difference between input-importing firms and non-input-importing firms, and the opposite prediction in terms of the wage impact difference between output-exporting firms and non-output-exporting firms.

will lead to a similar decrease in the dollar value of the firm's revenue, cost of labor and cost of other inputs, resulting in little or no change in the relevant price of labor at the headquarter relative to that at the firm's foreign establishments. However, recall that we showed in Panel A of Appendix Table A14 that a home country currency appreciation leads to a similar, if anything larger, increase in the foreign establishment wages of firms purchasing and/or producing less tradable goods and services. We also find a similar impact on *headquarter* wages of home country exchange rate shocks in firms purchasing and/or producing more/less tradable goods and services, and little heterogeneity in the impact on foreign establishment wages by job offshorability and multi-task content (see Panel B of Appendix Table A14). These three findings are all hard to reconcile with an across-country task-shifting story.[67]

The evidence thus suggests that a within-firm offshoring phenomenon is not the primary explanation for the transmission of exchange rate variation-induced headquarter wage changes to multinationals' foreign establishments. Such transmission appears to be due, at least in part, to wage anchoring.

3. Technology adoption in response to home country exchange rate shocks In contrast to minimum wage increases—which tend to be permanent—transitory exchange rate shocks are *a priori* unlikely to induce technology adoption. Nonetheless, analogous to the analysis of minimum wage increases in Panel B of Appendix Table A12, we also show in Panel C of Appendix Table A14 that the estimated wage impact of home country/state exchange rate shocks do not vary by job task content that is likely related to the complementarity between labor and computer capital (information technology). This is hard to reconcile with technology adoption explaining the estimated impact of home country exchange rate shocks on multinationals' foreign establishment wages.

[67] Several additional tests parallel to those in Point 2, Sub-section 4.3 do not support the job/task offshoring explanation either. Results in Appendix Table A15 show that the sets of occupations that are present at the foreign establishments neither shrink nor expand in response to exchange rate shocks, and that the employment of workers does not respond to exchange rate shocks either. In Column 2 of Appendix Table A13 we re-estimate the regression in Column 3 of Table 6, restricting the sample to the set of occupations that were already present in the relevant foreign establishment before the exchange rate shock. The results are similar to those in Table 6.

Appendix II Data Appendix

1. Additional Data Sources

1.1 Minimum Wage Data

The International Labour Organisation (ILO) includes a database on nominal gross monthly minimum wage (local currency) for 118 of the 170 countries observed in our primary dataset. The minimum wage is recorded as of December 31st of each year.[68] Monthly numbers are multiplied by 12 to calculate the annual nominal minimum wage. For the United States, we use the annual state minimum wage database in Vaghul & Zipperer (2016).

1.2 Exchange Rate Data

The yearly exchange rate dataset is downloaded from the World Bank, which records the official exchange rate (in currency units per current USD).[69] The yearly exchange rate is calculated as an annual average based on monthly averages.

1.3 Measures of Occupational Characteristics

Occupation crosswalks

i Crosswalk between the detailed job titles in our primary dataset and the 3-digit 2000 Standard Occupational Classification (SOC-00) codes is constructed using O-NET's code connector. We record the SOC code(s) of the first two entries.

ii Crosswalk between the (6-digit) 2000 Standard Occupational Classification (SOC-00) codes and the 2000 US Census Codes is available on the United States Census Bureau website.

iii The crosswalk between the 2000 US Census Codes and the *occ1990dd* occupation classification codes is available on David Dorn's website.[70]

iv Crosswalk between the 2000 Standard Occupational Classification (SOC-00) codes and the 1988 International Standard Classification of Occupations (ISCO-88) codes is available on the Institute for Structural Research (IBS) website.

v Crosswalk between the 1988 International Standard Classification of Occupations (ISCO-88) codes and the 1994 Brazilian Classification of Occupations (CBO-94) is available in Muendler *et al.* (2004).

[68] According to ILO, minimum wages are not reported for countries for which collective bargaining is in place for minimum wages. In cases where a national minimum wage is not mandated, the minimum wage in place in the capital or major city is used. In some cases, an average of multiple regional minimum wages is used. In countries where the minimum wage is set at the sectoral level or occupational level, the minimum wage for manufacturing or unskilled workers is generally applied.

[69] Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market.

[70] "The *occ1990dd* occupation classification aggregates U.S. Census occupation codes to a balanced panel of occupations for the 1980, 1990, and 2000 Census, as well as the 2005-2008 ACS."

Offshorability The offshorability index comes from Blinder & Krueger (2013)'s externally coded survey measure of job offshorability (the ability to perform the job's work duties from abroad). Micro-level survey data is available on Princeton Data Improvement Initiative (PDII).[71]

Task Complexity Occupations that are categorized as "single-task" include Cleaner, Guard, Messenger, Driver, Administrative Clerk, Shipping & Receiving Clerk, and Data Entry Clerk. All these occupations are low-skill occupations (skill levels 1-5 out of 16 levels in total). Non-single-task low-skill occupations include, for example, Reproductive Machine Operator, Mechanical/Operations Assistant, Accounting Clerk, etc.

Task content Measures for abstract, routine, and manual tasks come from Autor & Dorn (2013) (see their Appendix D for a detailed description). The data is available from the authors' website.[72]

1.4 Measures of Sectoral Characteristics

Skill share and labor share The sector-specific labor share is calculated using data from the BEA Input-Output Accounts, concorded to nails 6 digit and reduced to 2 digit NAICS using gross output values as weights. The sector-level skill share is the share of payroll going to occupations with skill level requirement 3 or 4 according to the ILO. The data is from the occupational employment survey in the US, collected on the NAICS 4-digit level and reduced to the 2-digit level using gross output as weights.[73]

Input and output tradability The country-sector specific tradability measures are constructed using data from the 2004 World Input-Output Tables in the World Input Out Database (WIOD) (Timmer *et al.* , 2015). Input (output) tradability is the share of the value of imported input (exported output) of the value of total input (out) in a given sector in a given country in 2004.[74]

1.5 Measures of Country-Level Characteristics

Hofstede's cultural measures The measures of Hofstede's national cultural dimensions are downloaded from Hofstede's website. These include Power distance index (PDI, our primary culture measure), Individualism vs. collectivism (IDV), Uncertainty avoidance index (UAI), Masculinity vs. femininity (MAS), Long-term orientation vs. short-term orientation (LTO), and Indulgence vs. restraint (IND).

Global Preferences Survey measures The country-level measures of preferences in the Global Preferences Survey (see Falk *et al.* , 2018) are downloaded here. Thesec include patience, risk taking, positive reciprocity, negative reciprocity, altruism and trust.

[71] The offshorability measure is first constructed at the level of 3-digit Standard Occupational Classification (SOC) codes and then mapped to the job titles in our primary dataset using Crosswalk i. When more than one SOC code is recorded for a given job title, the average offshorability measure is taken.

[72] The task content measures are mapped to the job titles in our primary dataset using crosswalks iii - ii - i.

[73] The measures are mapped to the International Standard Industrial Classification of All Economic Activities (ISIC) sector categories used in our primary dataset according to the definition here.

[74] The sector definition in WIOD follows the Crosswalk between the International Standard Industrial Classification of All Economic Activities (ISIC), the same as our primary dataset.

Other measures GDP per capita, Gini index, regulatory index, adult educational attainment, urban population shares are drawn from the World Bank and measured yearly.[75] The measure of collective bargaining (union coverage) in the public or private sector of a given country in a given year is defined as the proportion of all wage earners in this sector covered by collective bargaining agreement or statutory regulations and retrieved from the ICTWSS database.[76] For all these measures, we take the country-level average of these variables during 2005-2015 (our sample period).

1.6 Measures of Country-Pair Bilateral Characteristics

The country-pair-specific bilateral gravity measures, including a common language index, a dummy for common religion, a dummy for common legal origin, a dummy for a historical colonial relationship, the distance between capital cities, a dummy for sharing a border, a dummy for sharing a time zone, a dummy for regional trade agreements, are downloaded from the CEPII datasets. Measures of the bilateral migrant stocks are drawn from the World Bank.

1.7 Brazilian RAIS Data

The RAIS data is employer-employee administrative data collected through a mandatory survey by the Brazilian Ministry of Labor and Employment. We use data from the years 2005-2013 (the years covered in the multinational data). The dataset is at the individual worker level and contains individual identifiers, and firm and establishment identifiers. The firm identifiers are CNPJ numbers (Cadastro Nacional de Pessoa Juridica), identification numbers issued to all firms operating in Brazil (including non-profits). We use this identifiers to match firms in the multinational data to establishments in Brazil. We find identify 37 firms with establishments in Brazil.

Because the Company does not use standard occupation codes, we are unable to match individuals in Brazil (for whom we have CBO codes of occupations) to their direct job counterpart in the multinational data. We therefore instead match by skill level of the job. We do this by taking the average education level of individuals in a particular CBO in Brazil, as well as the average "level" people are at in the firm (manager, assistant manager), and match into the respective skill level in the Company's data. These multinationals are headquartered in the United States (61%), Germany (13%), Switzerland (12%), the UK (6%), France (5%), Finland (1.5%) and the remainder are spread equally across Australia, Canadaa, Ireland, and New Zealand.

We have information in individual's wages, hiring date, date of job termination and reason for termination, as well as various demographic characteristics including age, gender, race, and education. Summary statistics are provided in Appendix Table A1. The wages in the Company's data have an roughly 80% correlation with wages in the Brazilian data.

2. Data Processing

The dataset from the Company is an unbalanced panel at establishment$\times$year level, and contains a few large wage changes within the same establishment in neighboring years that are very likely due to data entry errors. We process the wage data in the following two ways to address the potential estimation issues associated with these two features.

[75] A country's regulatory index is meant to capture the country's regulatory environment that affects growth of the private sector. The index is based on surveys and legal analysis conducted by the World Bank. A higher regulatory index means that a country's government is better able to create and implement regulations that promote private sector development. Adult education is the share of adults over the age of 25 who have received higher education.

[76] If sector-specific union coverage measure is missing, we use the average measure pooling the public and the private sectors.

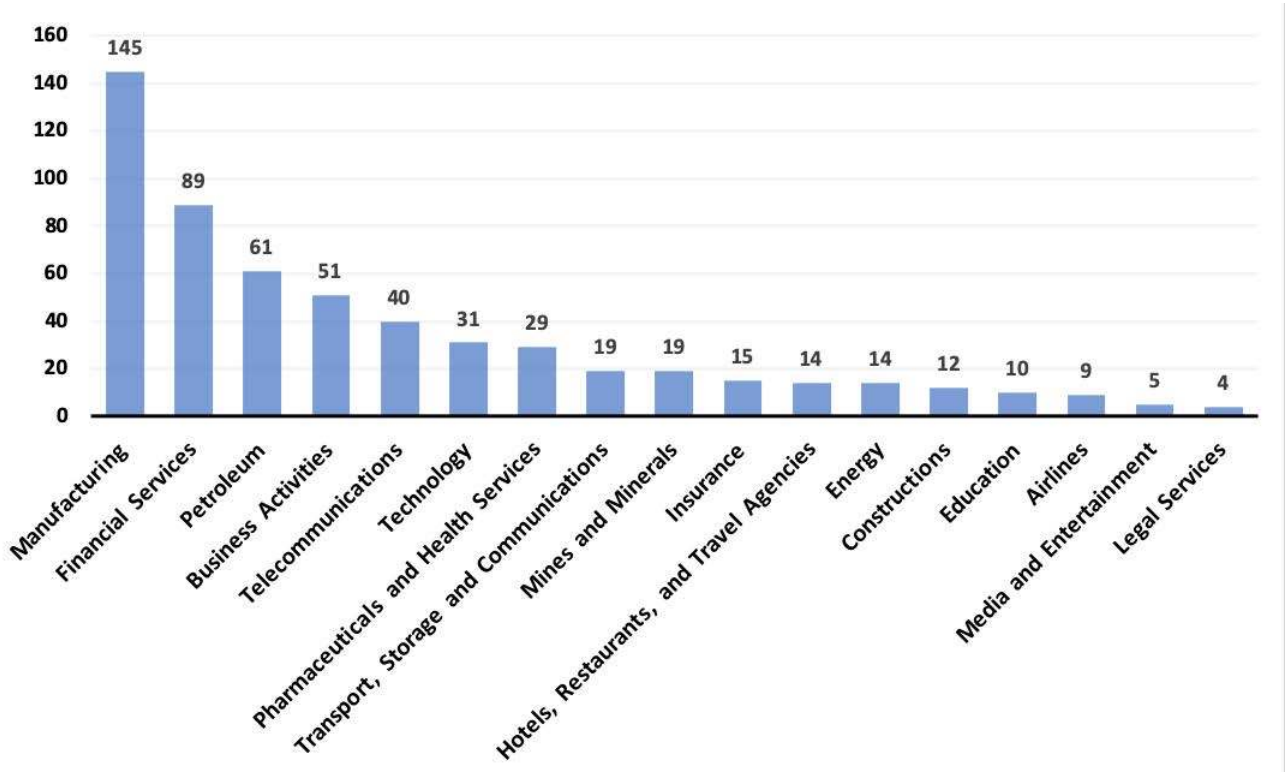
Trimming Outliers We drop observations with a wage change between two consecutive surveyed years larger than 100%. This trimming procedure drops less than 2% of the total observations.[77]

Adjusting for Panel Unbalancedness There are instances in which a firm experiences more than one home country minimum wage change between two consecutive survey years. For example, we see some cases in which if a firm is surveyed in 2005 and 2007 but its home country's minimum wage increases both in 2005 and 2006. In such instances, we use the most recent minimum wage increase as the independent variable and re-scale the associated gross wages by the ratio of the most recent minimum wage increase and the cumulative minimum wage increase. Because the cumulative minimum wage increase and the growth in job-specific wages are both likely to be larger when there is a longer time gap between two consecutive survey years, failing to re-scale the correlation between the two might spuriously capture the unbalanced panel feature of the dataset. The procedure also applies to any other regression in which the un-interacted home country minimum wage changes is the main independent variable of interest.

[77] If data entry errors were more likely to occur when there was a longer time gap between two consecutive surveys on the same establishment, and home country minimum wage changes were also larger when the time gap was longer, including possibly erroneous outliers with very large wage growth could lead to a spurious positive correlation between the firm wage change and home country minimum wage change.

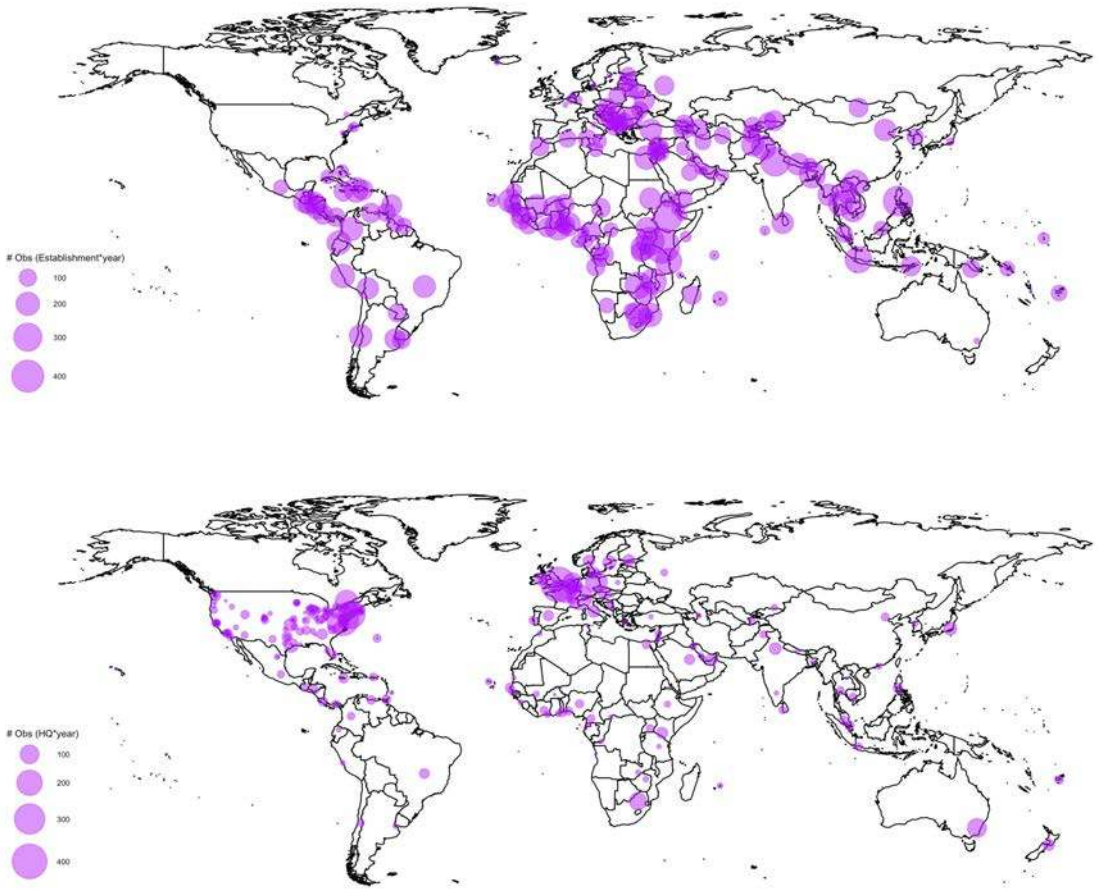
Appendix III Figure Appendix

FIGURE A1: SECTOR DISTRIBUTION OF PRIVATE-SECTOR FIRMS IN THE SAMPLE



Note: This figure displays the sectoral distribution of the private-sector firms in the full sample.

FIGURE A2: FOREIGN ESTABLISHMENT AND HQ LOCATIONS



Note: This figure displays the geographical distribution of the establishments (top panel) in the full sample of multinationals and their headquarters (bottom panel). The bubble size weight is the number of establishment (headquarters)×year observations in each city.

FIGURE A3: HOFSTEDE POWER DISTANCE INDEX (PDI)

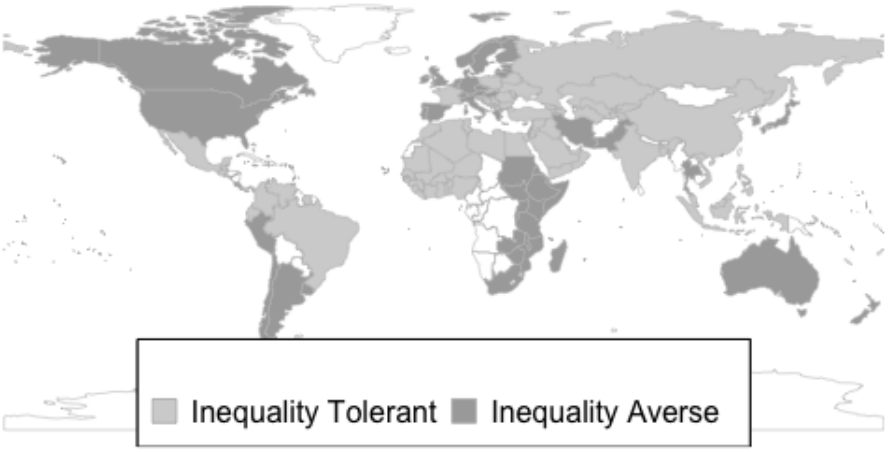
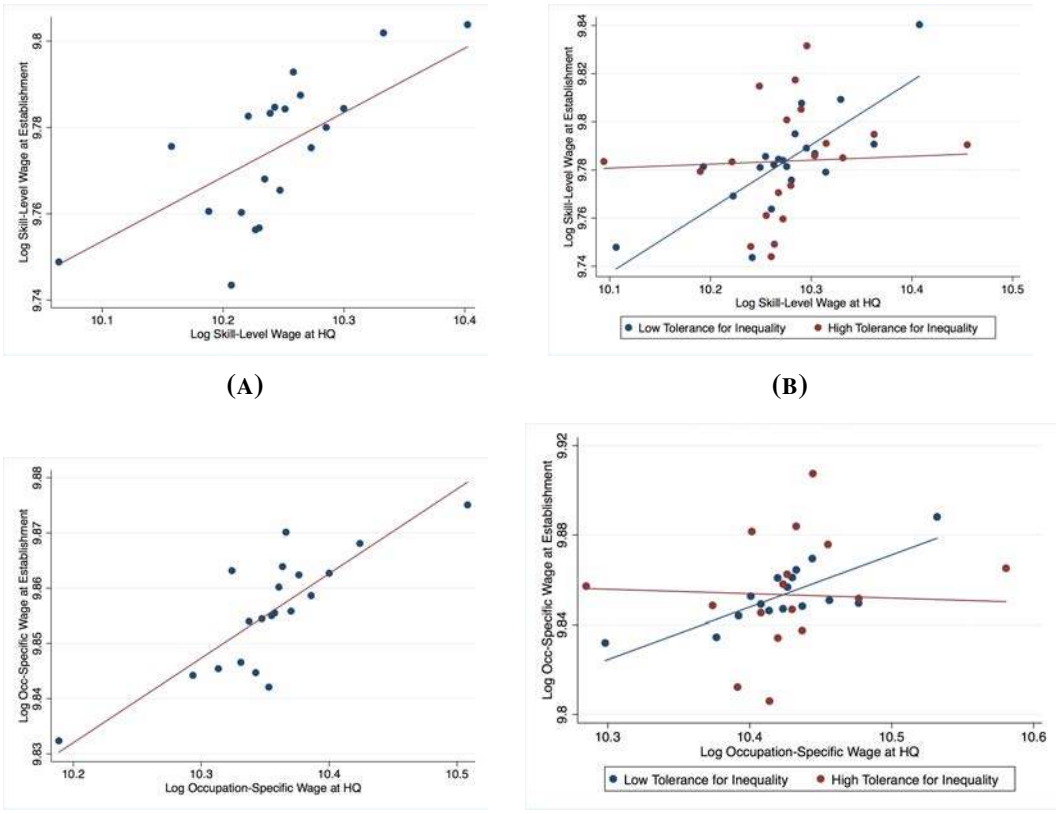


FIGURE A4: CORRELATION BETWEEN HQ AND FOREIGN ESTAB. WAGES

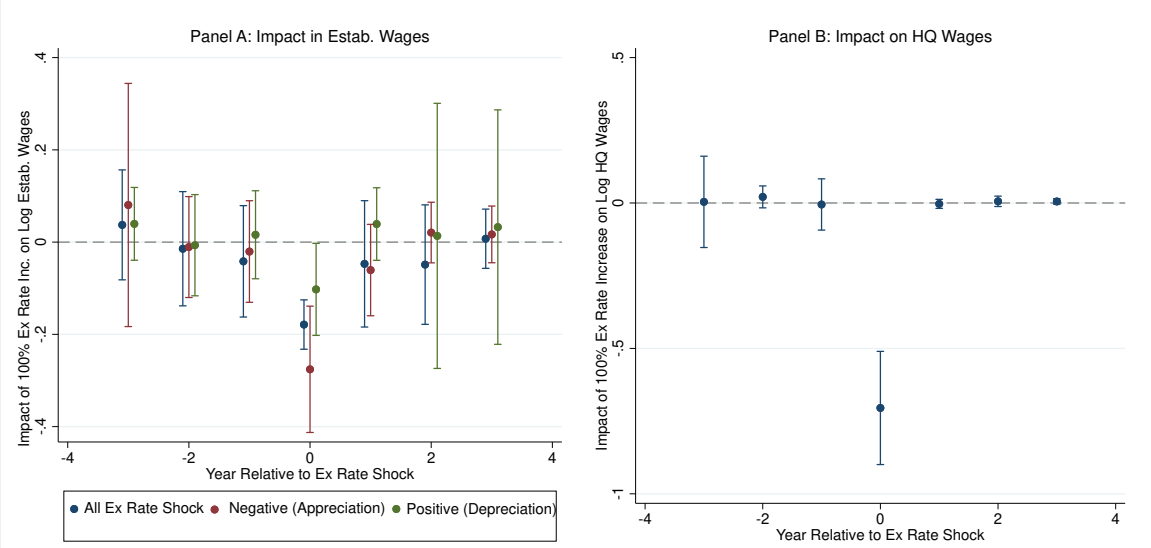


(A) **(B)**

(C) **(D)**

Note: These binned scatterplots show the relationship between headquarter and establishment wages by skill level (Panels A and B) and occupation level (Panels C and D). The y-variable in Panels A and B is the skill-level log wage at an establishment. The y-variable in Panels C and D is the occupation-specific log wage at an establishment. In Panels B and D, we split the sample into countries that have a high or low tolerance to inequality, as defined in Section 3. To construct each plot, establishment wages are first residualized with respect to the following controls: the average skill level-level or job-level wage for other employers' establishments operating in the same city, city×year fixed effects, and firm×skill level (or firm×job) fixed effects. The x-variable, log wage at the headquarters, is then divided into twenty equal-sized groups. Wages at headquarters are also measured at either the skill level (A and B) or the occupation level (C and D). Within each of these groups, we plot the mean of the y-variable residuals against the mean of the x-variable. We then add back the unconditional mean of the y-variable (establishment wages), to help with the interpretation of the line of best fit. The lines of best fit for each scatter plot are as follows. Panel A: $\hat{\beta} = 0.130$ (s.e.=0.030). Panel B: $\hat{\beta}_L = 0.239$ (s.e.=0.044) and $\hat{\beta}_H = 0.010$ (s.e.=0.047). Panel C: $\hat{\beta} = 0.126$ (s.e.=0.027). Panel D: $\hat{\beta}_L = 0.205$ (s.e.=0.036) and $\hat{\beta}_H = 0.017$ (s.e.=0.056).

FIGURE A5: IMPACT OF HQ EX. RATE ON FIRM WAGES



Note: This impulse response study plots the coefficients from a regression in which occupation-specific log gross wages (in current USD terms) at the foreign establishments (Panel A) and the headquarters (Panel B) of a firm in year $t-3$ to $t+3$ are regressed on the detrended log exchange rate in year t in the firm's home country. Employer×year and establishment-city×year fixed effects are included. Exchange rates are detrended from home-country-specific time trends. All foreign establishments located in the same currency zone as the headquarters are excluded. The blue dots show the estimates where the full sample is included; in Panel A, the red (green) dots show the estimates where only appreciation (depreciation) in year t (compared to year $t-1$) in the firm's home country is included.

Appendix IV Table Appendix

TABLE A1: RAIS DATA SUMMARY STATISTICS

	Mean	Min	Max	SD
Occupations	17.8	1	149	20.8
Workers	995.4	1	178,225	4730.4
% Brazilian	99.4	0	1	2.9
% no High School	10.5	0	86.0	16.4
Tenure (months)	55.3	0.5	469.3	50.0
Yearly Wages (USD)	33,896.2	7007.5	642,216.6	36,507.4

Note: This table reports the mean, minimum, and maximum values, as well as the standard deviations of the listed variables in the RAIS data. Variables are measured at the firm establishment-by-year level so that an observation is a firm establishment-year. Occupations is the average number of occupations present in a firm's establishment in a given year. Workers is the number of full-time workers at a firm's establishment in a given year. % no High School is the percent of workers within a firm's establishment who did not finish high school. % Brazilian is the percent of workers who are Brazilian nationals. Tenure is the number of months a worker is at a specific establishment. Wages are measured in US dollars.

TABLE A2: RELATIONSHIP BETWEEN HQ AND FOREIGN ESTABLISHMENT WAGES (PRIVATE SECTOR)

Sample	*Sample 3* MNEs w/ estab.-HQ match w/in occ×year			*Sample 2* MNEs w/ estab.-HQ match w/in occ	
Unit of Observation	estab×occ×yr	estab×skill-lev×yr	estab×yr	estab×occ	estab×occ×yr
Data Structure	Panel	Panel	Panel	Cross-sectional	Panel (Imputed Estab. Panel)
Dep. Var.	Log Wage at Foreign Establishment				
	Panel A: Local Benchmark Wage Control				
	(1)	(2)	(3)	(4)	(5)
Log HQ Wage	0.254*	0.147	0.849**	0.151***	0.245**
	(0.147)	(0.129)	(0.254)	(0.058)	(0.119)
Log Benchmark Wage	0.215***	0.227**		0.528***	0.013***
	(0.025)	(0.071)		(0.061)	(0.004)
Employer×Occ FE	Y				
Employer×Skill-level FE		Y			
Employer FE			Y	Y	Y
Estab.-City×Year FE	Y	Y	Y		Y
Occ FE				Y	Y
Estab.-City FE				Y	
Observations	5,982	2,562	102	1,835	10,571
	Panel B: Estab.-city×Occupation×Year Fixed Effects				
	(1)	(2)	(3)	(4)	(5)
Log HQ Wage	0.163***	0.286***	0.849**	0.151**	0.422***
	(0.045)	(0.084)	(0.254)	(0.064)	(0.016)
Employer×Occ FE	Y				
Employer×Skill-level FE		Y			
Employer FE			Y	Y	Y
Estab.-City×Year FE			Y		
Estab.-City×Occ×Year FE	Y				Y
Estab.-City×Skill-level×Year FE		Y			
Estab.-City×Occ FE				Y	
Observations	5,990	2,570	102	1,846	12,508

Note: This table replicates the analysis in Table 2, restricting the sample to private-sector multinationals. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A3: HETERO. HQ-ESTABLISHMENT WAGE CORRELATION BY SKILL LEVELS

	Log Occ-Specific Wage at Foreign Establishment			
	(1)	(2)	(3)	(4)
Log HQ Wage	0.153***	0.276**	0.157***	0.245***
	(0.048)	(0.129)	(0.049)	(0.050)
Log HQ Wage		-0.173***		-0.140***
× Middle Skill Occ.		(0.025)		(0.046)
Log HQ Wage		-0.157**		-0.106
× High Skill Occ.		(0.063)		(0.102)
Log Local Benchmark Wage	0.137***	0.138***		
	(0.040)	(0.040)		
Employer×Occ FE	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	N	N
Estab.-City×Occ×Year FE	N	N	Y	Y
Observations	19,520	19,520	19,525	19,525

Note: This table shows the correlations between a firm's wage levels at its headquarters and its establishments at different skill levels. The outcome variables are the occupation-specific log wage at an establishment in a given year. An occupation is middle- (high-) skill if its skill level (defined globally by the Company, 16 skill levels in total) is between 6 and 10 (higher than 10). In columns (1) & (2), establishment city local occupation-specific benchmark wage controls are included; in columns (3) & (4), the local benchmark wage controls and the establishment-city×occupation×year fixed effects are replaced by establishment-city×occupation×year fixed effects. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A4: HETERO. HQ-ESTABLISHMENT WAGE CORRELATION BY SKILL LEVELS (PRIVATE SECTOR)

	Log Occ-Specific Wage at Foreign Establishment			
	(1)	(2)	(3)	(4)
Log HQ Wage	0.254*	0.506**	0.161***	0.241***
	(0.147)	(0.181)	(0.048)	(0.040)
Log HQ Wage		-0.208***		-0.128***
× Middle Skill Occ.		(0.015)		(0.043)
Log HQ Wage		-0.210***		-0.065
× High Skill Occ.		(0.021)		(0.077)
Log Local Benchmark Wage	0.215***	0.216***		
	(0.025)	(0.024)		
Employer×Occ FE	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	N	N
Estab.-City×Occ×Year FE	N	N	Y	Y
Observations	5,982	5,982	5,990	5,990

Note: This table replicates the analysis in Appendix Table A3, restricting the sample to private-sector multinationals. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A5: HETERO. HQ-ESTAB. WAGE CORRELATION BY HQ COUNTRY INEQ. AVERSION (PRIVATE SECTOR)

	Panel A: Wage Level Anchoring					
	Log Occ-Specific Wage at Foreign Establishment					
	(1)	(2)	(3)	(4)	(5)	(6)
Log HQ Wage	0.225*	0.323*	0.279*	0.163***	0 .184***	0.171***
	(0.133)	(0.170)	(0.170)	(0.049)	(0.035)	(0.035)
Log HQ Wage		-0.322	-0.335		-0.325	-0.286
× HQ-Country Low Ineq. Aversion		(0.249)	(0.247)		(0.214)	(0.223)
Log HQ Wage			0.048***			0.017***
× Estab.-Country Low Ineq. Aversion			(0.010)			(0.001)
Log Local Benchmark Wage	0.228***	0.228***	0.152***			
	(0.034)	(0.034)	(0.037)			
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Estab.-City×Occ×Year FE	N	N	N	Y	Y	Y
Observations	5,773	5,773	5,771	5,780	5,780	5,778
	Panel B: Wage Slope Anchoring					
	Occ. Category-Specific Wage Slope at Foreign Establishment					
	(1)	(2)	(3)	(4)	(5)	(6)
HQ Wage Slope	0.317***	0.332***	0.243**	0.298***	0.313***	0.344***
	(0.084)	(0.085)	(0.097)	(0.051)	(0.050)	(0.060)
HQ Wage Slope		-0.425**	-0.431**		-0.431**	-0.428***
× HQ-Country Low Ineq. Aversion		(0.205)	(0.205)		(0.187)	(0.187)
HQ Wage Slope			0.095*			-0.033
× Estab.-Country Low Ineq. Aversion			(0.049)			(0.038)
Local Benchmark Wage Slope	0.026	0.025	0.033***			
	(0.018)	(0.018)	(0.012)			
Employer×Occ-Type×Skill Level-Pair FE	Y	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Estab.-City×Occ-Type×Skill Level-Pair×Year FE	N	N	N	Y	Y	Y
Observations	3,846	3,846	3,846	3,852	3,852	3,852

Note: This table replicates the analysis in Table 3, restricting the sample to private-sector multinationals. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A6: ANCHORING AND CORRELATES OF INEQUALITY AVERSION (HQ COUNTRY CHARACTERISTICS)

	Occupation-Specific Log Wage at Establishment					
	(1)	(2)	(3)	(4)	(5)	(6)
Log HQ Wage	0.254***	0.261***	0.269***	0.375***	0.362*	0.262***
	(0.041)	(0.045)	(0.053)	(0.140)	(0.100)	(0.043)
Log HQ Wage × HQ-Country Low Ineq. Aversion	-0.225**	-0.308**	-0.301***	-0.303***	-0.383***	-0.316***
	(0.092)	(0.139)	(0.050)	(0.045)	(0.091)	(0.126)
Log HQ Wage × High Gini Index	-0.085***					
	(0.029)					
Log HQ Wage × High GDP per capita		0.014				
		(0.116)				
Log HQ Wage × High Bargaining (or Union) Coverage			0.067			
			(0.142)			
Log HQ Wage × High Regulation				-0.104		
				(0.108)		
Log HQ Wage × High Adult Edu. Attainment					-0.007**	
					(0.014)	
Log HQ Wage × High Urban Pop. Share						0.022
						(0.107)
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y	Y	Y
Observations	18,587	18,587	18,587	18,587	18,587	18,587
R-squared	0.960	0.960	0.960	0.960	0.960	0.960

Note: This table tests whether home country characteristics, which potentially correlate with the Hofstede measure of inequality aversion, account for the relationship between headquarter and establishment wages. "High Gini Index" is a dummy indicating that the home country has above-sample-mean average Gini in 2005-2015. "High GDP per capita" is a a dummy indicating that the home country has above-sample-mean average GDP per capita in 2005-2015. "High Bargaining (or Union) Coverage" is a dummy indicating that the home country×sector (public or private) has above-sample-mean share of employees covered by collective bargaining or union. If sector-specific unionization information is missing, we use the home country averages pooling public and private sectors. "High Regulation" is a dummy for the home country having above-sample-mean degree of regulation. "High Adult Education Attainment" is a dummy indicating that the home country's average share of adults with higher education in 2005-2015 is above the sample mean. "High Urban Population Share" is a dummy indicating that the home country's average urban population share in 2005-2015 is above the sample mean. In all columns, we also interact the headquarter wage with a binary variable indicating whether a country is classified as having low inequality aversion according to the Hofstede measures of culture. If the variable "Low Ineq. Aversion" equals one, it indicates that the home country is more accepting of inequality than the average country in the sample. The outcome variable is always the occupation-specific wage at an establishment. All wages are in logs. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A7: ANCHORING AND CORRELATES OF INEQUALITY AVERSION (HQ-ESTAB. RELATIONSHIP)

Panel A: Cultural & Historical Bonds	Occupation-Specific Log Wage at Establishment					
	(1)	(2)	(3)	(4)	(5)	(6)
Log HQ Wage	0.282***	0.249***	0.254***	0.249***	0.248***	0.232***
	(0.063)	(0.057)	(0.059)	(0.058)	(0.059)	(0.050)
Log HQ Wage	-0.281***	-0.283***	-0.275***	-0.276***	-0.278***	-0.294***
× HQ-Country Low Ineq. Aversion	(0.059)	(0.062)	(0.059)	(0.059)	(0.060)	(0.056)
Log HQ Wage	-0.038					
× Common Language Index	(0.032)					
Log HQ Wage		0.009				
× Common Religion		(0.015)				
Log HQ Wage			-0.006			
× Common Legal Origin			(0.005)			
Log HQ Wage				0.048***		
× Ever in Colonial Relationship				(0.012)		
Log HQ Wage					0.000	
× Log HQ-to-Estab. Migrant Stock					(0.001)	
Log HQ Wage						0.003***
× Log Estab.-to-HQ Migrant Stock						(0.001)
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y	Y	Y
Observations	13,723	14,638	14,638	14,638	14,725	14,725
R-squared	0.959	0.960	0.960	0.960	0.959	0.959
Panel B: Geographical Proximity, Trade Connections, Wealth Diff.	Occupation-Specific Log Wage at Establishment					
	(1)	(2)	(3)	(4)	(5)	
Log HQ Wage	0.301***	0.244***	0.251***	0.251***	0.251***	0.260***
	(0.057)	(0.058)	(0.058)	(0.059)	(0.062)	(0.059)
Log HQ Wage	-0.295***	-0.279***	-0.277***	-0.279***	-0.278***	-0.286***
× HQ-Country Low Ineq. Aversion	(0.058)	(0.059)	(0.059)	(0.060)	(0.062)	(0.059)
Log HQ Wage	-0.004**					
× Log Distance	(0.002)					
Log HQ Wage		0.023***				
× Common Border		(0.010)				
Log HQ WageQ			0.000			
× Time Zone Difference			(0.001)			
Log HQ Wage				-0.009		
× Common Currency Zone				(0.015)		
Log HQ WageQ					-0.000	
× Regional Trade Agreements					(0.001)	
Log HQ Wage						-0.007
× Estab. Country Richer						(0.004)
Employer×Occ FE	Y	Y	Y	Y	Y	
Estab.-City×Year FE	Y	Y	Y	Y	Y	
Observations	14,814	14,638	14,638	14,638	14,638	14,814
R-squared	0.959	0.960	0.960	0.960	0.960	0.096

Note: This table tests whether the relationship (proximity/gravity measures) between home country and establishment countries, which potentially correlate with the Hofstede measure of inequality aversion, account for the relationship between headquarter and establishment wages. The outcome variable is always the occupation-specific wage at an establishment. All wages are in logs. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A8: ANCHORING AND CORRELATES OF INEQUALITY AVERSION (SECTOR CHARACTERISTICS)

	Occupation-Specific Log Wage at Establishment				
	(1)	(2)	(3)	(4)	(5)
Log HQ Wage	0.384**	0.478*	0.253***	0.253***	0.311*
	(0.167)	(0.247)	(0.067)	(0.067)	(0.183)
Log HQ Wage × HQ-Country Low Ineq. Aversion	-0.250***	-0.247***	-0.287***	-0.287***	-0.343*
	(0.069)	(0.070)	(0.064)	(0.064)	(0.179)
Log HQ Wage × High Labor Intensity	-0.176				
	(0.193)				
Log HQ Wage × High Skill Intensity		-0.273			
		(0.263)			
Log HQ Wage × High Output Tradability			0.214		
			(0.251)		
Log HQ Wage × High Input Tradability				0.215	
				(0.251)	
Log HQ Wage × High Job Offshorability					-0.045
					(0.146)
Employer×Occ FE	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y	Y
Observations	17,169	17,169	18,587	18,587	18,587
R-squared	0.959	0.959	0.960	0.960	0.960

Note: This table tests whether characteristics of the sector an employer operates in, which potentially correlate with the Hofstede measure of inequality aversion, account for the relationship between headquarter and establishment wages. "High Labor Intensity" ("High Skill Intensity") is a dummy indicating that the sector's labor share (skill share) is above the sample mean (see detailed definitions in the Appendix). "High Output Tradability" ("High Input Tradability") is a dummy indicating the sector's share of exported output (imported input) is above sample mean. The input/output shares are calculated using year-2004 data from the World Input-Output Database (WIOD) (Timmer *et al.* , 2015). "High Job Offshorability" is a dummy indicating that the average offshorablilty index of occupations employed in this sector is above the sample mean. The offshorability index is constructed according to Blinder & Krueger (2013). The outcome variable is always the occupation-specific wage at an establishment. All wages are in logs. Standard errors are reported in parentheses and clustered at the employer level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A9: IMPACT OF HQ MIN. WAGE CHANGES ON FIRM WAGES (SAMPLE ROBUSTNESS)

	Low-skill Occupations Only	
Sample	*Sample 1* (All MNCs)	
	Private Sectors	Pre-existing Jobs
Estimation Method	Two-sample 2SLS	
	(1)	(2)
Panel A: Reduced form	%Δ Estab. Wage	
%Δ HQ Min Wage	0.075***	0.041**
	(0.019)	(0.016)
Panel B: First stage	%Δ HQ Wage	
%Δ HQ Min Wage	0.107*	0.092**
	(0.060)	(0.045)
Panel C: IV (2SLS)	%Δ Estab. Wage	
%Δ HQ Wage (IVed)	0.706*	0.442
	(0.415)	(0.279)
Employer×Occ FE	Y	Y
Estab.-City×Year FE	Y	Y
Obs (Panels A, C)	6,994	56,586
(Panel B)	3,304	5,189

Note: This table shows results replicating Table 4, restricting the sample to multinationals in private sectors (column 1) and to jobs that already existed in the relevant foreign establishment in the immediately preceding year surveyed (column 2). We perform two-sample 2SLS by estimating the first stage using all jobs in all headquarters, and the second stage & reduced form using all jobs in all foreign establishments. Standard errors are reported in parentheses and clustered at the home-country(state) level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A10: IMPACT OF HQ MIN. WAGE CHANGES ON NON-LOW-SKILL OCC. WAGES

Panel A: Middle- & High-Skill Occ in Estab.	%Δ Estab. Wage				
	(1)	(2)	(3)	(4)	(5)
%Δ HQ Min Wage	0.009	0.013	0.012	0.007	0.011
	(0.016)	(0.012)	(0.020)	(0.013)	(0.014)
%Δ HQ Min Wage		-0.006			
×High Occ. Offshorability		(0.009)			
%Δ HQ Min Wage			-0.004		
×Abstract Task			(0.009)		
%Δ HQ Min Wage				0.007	
×Routine Task				(0.011)	
%Δ HQ Min Wage					-0.003
×Manual Task					(0.012)
Employer×Occ FE	Y	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y	Y
Observations	70,406	70,406	70,406	70,406	70,406
R-squared	0.472	0.472	0.472	0.472	0.472
Panel B: Middle- & High-Skill Occ in HQ	%Δ HQ Wage				
	(1)	(2)	(3)	(4)	(5)
%Δ HQ Min Wage	0.018	0.006	0.019	0.019	0.017
	(0.024)	(0.028)	(0.022)	(0.033)	(0.023)
%Δ HQ Min Wage		0.016			
×High Occ. Offshorability		(0.016)			
%Δ HQ Min Wage			-0.003		
×Abstract Task			(0.016)		
%Δ HQ Min Wage				-0.003	
×Routine Task				(0.020)	
%Δ HQ Min Wage					0.001
×Manual Task					(0.014)
Employer×Occ FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Observations	6,250	6,250	6,250	6,250	6,250
R-squared	0.411	0.411	0.411	0.411	0.411

Note: This table shows the impact of minimum wage increase in a firm's home country has on gross wages paid to non-low-skill jobs in its foreign establishments (Panel A) and its headquarters (Panel B). An occupation is non-low-skill if its skill level (defined globally by the Company, 16 skill levels in total) is higher than 5. An occupation is defined as highly offshorable if its offshorablilty index is above the sample mean. The offshorability index is constructed according to Blinder & Krueger (2013). An occupation is defined as abstract-task (routine-task, manual task) if its abstractness (routineness, manualness) index is above the sample mean. The abstractness, routineness, manualness indices are from Autor & Dorn (2013). All foreign establishments and all headquarters are used in the estimation. Outliers with wage changes larger than 50% are excluded. Standard errors are reported in parentheses and clustered at the home-country(state) level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A11: IMPACT OF HQ MIN. WAGE ON BINDING OCCUPATIONS/FIRMS

Panel A: Binding Occupations (v. Others) w/in Establishment×Year	%Δ Estab. Wage (1)	%Δ HQ Wage (2)	%Δ Estab. Wage (3)
%Δ HQ Min Wage × Occ. Binding (Binary: below New Min Wage)	0.088*** (0.029)	0.209** (0.096)	
%Δ HQ Wage (IVed)			0.423** (0.180)
Employer×Occ FE	Y	Y	Y
Employer×Estab.×Year FE	Y	Y	Y
Observations	7,803	2,447	7,803
R-squared	0.721	0.717	0.721
Panel B: Heterogeneity by Firm Bindingness on Low-Skill Occ'n.s w/in HQ-City×Year	%Δ Estab. Wage (1)	%Δ HQ Wage (2)	%Δ Estab. Wage (3)
%Δ HQ Min Wage ×Firm Bindingness (Kaitz: Min Wage-Median Wage Ratio)	1.373*** (0.527)	4.705*** (0.048)	
%Δ HQ Wage (IVed)			0.292*** (0.112)
Employer×Occ FE	Y	Y	Y
Estab.-City×Year FE	Y	N	Y
HQ-City×Year FE	Y	Y	Y
Observations	34,634	994	34,634
R-squared	0.472	0.825	0.472
Panel C: Heterogeneity by Firm Bindingness on Binding Occ'n.s (v. Others) w/in HQ-City×Year	%Δ Estab. Wage (1)	%Δ HQ Wage (2)	%Δ Estab. Wage (3)
%Δ HQ Min Wage×Occ. Binding	0.086 (0.058)	0.126*** (0.043)	
%Δ HQ Min Wage×Occ. Binding ×Firm Bindingness (sample median deviation)	1.243*** (0.404)	4.045** (1.929)	
%Δ HQ Min Wage×Occ. Non-binding ×Firm Bindingness (sample median deviation)	0.896** (0.375)	3.864** (1.924)	
%Δ HQ Wage (IVed)			0.241 (0.152)
Employer×Occ FE	Y	Y	Y
Estab.-City×Year FE	Y	N	Y
HQ-City×Year FE	Y	Y	Y
Observations	6,505	3,884	6,505
R-squared	0.712	0.801	0.712

Note: This table shows the impact of home-minimum-wage-induced changes in the headquarter wages of a firm on the same-occupation wages at its foreign establishments. Columns 1 and 2 show the same results as in columns 1 and 3 of Table 5. Column 3 shows the two-sample 2STS second stage results linking headquarter and foreign establishment wages, using column 1 as the reduced form and column 2 as the first stage. Outliers with wage changes larger than 50% are excluded. Standard errors are reported in parentheses and clustered at the home-country(state) level. TS2SLS standard errors are computed following Pacini & Windmeijer (2016). (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A12: ROBUSTNESS OF IMPACT OF HQ COUNTRY MIN. WAGE CHANGE ON WAGES

Panel A: w/in Employer Offshoring	%Δ Estab. Wage			%Δ HQ Wage		
	(1)	(2)	(3)	(4)	(5)	(6)
%Δ Min Wage	0.042**	0.043***	0.044**	0.072*	0.099**	0.077**
	(0.018)	(0.018)	(0.020)	(0.037)	(0.042)	(0.036)
%Δ HQ Min Wage	-0.003		-0.002	0.051		0.052
× High Occ. Offshorability	(0.011)		(0.010)	(0.046)		(0.047)
%Δ HQ Min Wage		-0.008	-0.008		-0.010	-0.012
× Single-task Occ.		(0.019)	(0.018)		(0.025)	(0.024)
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Year FE	N	N	N	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Observations	57,026	57,026	57,026	5,215	5,215	5,215
R-squared	0.503	0.503	0.503	0.276	0.275	0.276
Panel B: Technology Adoption	%Δ Estab. Wage			%Δ HQ Wage		
	(1)	(2)	(3)	(4)	(5)	(6)
%Δ Min Wage	0.044**	0.033**	0.036**	0.095**	0.050	0.115***
	(0.018)	(0.014)	(0.018)	(0.042)	(0.047)	(0.045)
%Δ HQ Min Wage	-0.025*			-0.000		
× Abstract Task	(0.015)			(0.043)		
%Δ HQ Min Wage		0.011			0.067*	
× Routine Task		(0.008)			(0.038)	
%Δ HQ Min Wage			0.021			-0.097
× Manual Task			(0.017)			(0.060)
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Year FE	N	N	N	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Observations	57,026	57,026	57,026	5,215	5,215	5,215
R-squared	0.503	0.503	0.503	0.275	0.276	0.276

Note: Panel A compares the differential impact of minimum wage increase in a home country on the gross wages paid to low-skill occupations of high and low offshorability and of different task complexity, both in the foreign establishments (columns 1, 2 & 3) as well as the headquarters (columns 4, 5, & 6) of multinationals headquartered in that country. An occupation is defined as highly offshorable if its offshorablilty index is above the sample mean. The offshorability index is constructed according to Blinder & Krueger (2013). Occupations defined as single-task include: cleaner, messenger, guard, driver, data entry clerk, administrative clerk and shipping & receiving clerk. Panel B compares the differential impact of minimum wage increase in a home country on the gross wages paid to low-skill occupations of high and low abstractness, routineness and manualness, both in the foreign establishments (columns 1, 2 & 3) as well as the headquarters (columns 4, 5, & 6) of multinationals headquartered in that country. An occupation is defined as abstract-task (routine-task, manual task) if its abstractness (routineness, manualness) index is above the sample mean. The abstractness, routineness, manualness indices are from Autor & Dorn (2013). Outliers with percentage wage changes larger than 50% are excluded. Standard errors are reported in parentheses and clustered at the home-country(state) level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A13: IMPACT OF HQ EX. RATE SHOCKS ON FIRM WAGES (SAMPLE ROBUSTNESS)

Sample	*Sample 1* (All MNCs)	
	Private Sectors	Pre-existing Jobs
Estimation Method	TS2SLS	
	(1)	(2)
Panel A: Reduced form	Log Estab. Wage	
Log HQ Ex. Rate	-0.359***	-0.149***
	(0.118)	(0.042)
Panel B: First stage	Log HQ Wage	
Log HQ Ex. Rate	-0.896***	-0.682***
	(0.205)	(0.123)
Panel C: IV (2SLS)	Log Estab. Wage	
Log HQ Wage (IVed)	0.400**	0.219***
	(0.160)	(0.073)
Employer×Occ FE	Y	Y
Estab.-City×Year FE	Y	Y
Obs (Panels A, C)	68,704	229,556
(Panel B)	7,665	9,668

Note: This table shows results replicating Table 6, restricting the sample to multinationals in private sectors (column 1) and to jobs that already existed in the relevant foreign establishment in the immediately preceding year surveyed (column 2). We perform two-sample 2SLS by estimating the first stage using all jobs in all headquarters, and the second stage & reduced form using all jobs in all foreign establishments. Exchange rates are detrended from home-country-specific time trends. All foreign establishments located in the same currency zone as the headquarters are excluded. Standard errors are reported in parentheses and clustered at the home-country-currency-zone level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A14: ROBUSTNESS OF IMPACT OF HQ COUNTRY EX. RATE SHOCKS ON WAGES

Panel A: Exporting/Importing Sectors	Log Estab. Wage			Log HQ Wage		
	(1)	(2)	(3)	(4)	(5)	(6)
Log HQ Ex. Rate	-0.157***	-0.218***	-0.214***	-0.668***	-0.671**	-0.669***
	(0.055)	(0.068)	(0.071)	(0.118)	(0.128)	(0.128)
Log HQ Ex. Rate	0.002		-0.079	-0.109		-0.180
× High Output Exporting	(0.155)		(0.146)	(0.203)		(0.210)
Log HQ Ex. Rate		0.154	0.175		-0.178	0.002
× High Input Importing		(0.104)	(0.102)		(0.441)	(0.120)
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Year FE	N	N	N	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Observations	267,301	267,301	267,301	28,451	28,451	28,451
R-squared	0.888	0.888	0.888	0.988	0.988	0.988
Panel B: w/in Employer Offshoring	Log Estab. Wage			Log HQ Wage		
	(1)	(2)	(3)	(4)	(5)	(6)
Log HQ Ex. Rate	-0.148***	-0.151***	-0.141***	-0.706***	-0.723***	-0.737***
	(0.043)	(0.038)	(0.041)	(0.101)	(0.100)	(0.102)
Log HQ Ex. Rate	-0.015		0.018	0.002		0.023
× High Occ. Offshorability	(0.022)		(0.022)	(0.027)		(0.026)
Log HQ Ex. Rate		-0.026	0.029		0.114**	0.121**
× Single-task Occ.		(0.038)	(0.038)		(0.057)	(0.058)
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Year FE	N	N	N	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Observations	267,301	267,301	267,301	28,451	28,451	28,451
R-squared	0.888	0.888	0.888	0.988	0.988	0.988
Panel C: Technology Adoption	Log Estab. Wage			Log HQ Wage		
	(1)	(2)	(3)	(4)	(5)	(6)
Log HQ Ex. Rate	-0.136***	-0.183***	-0.142***	-0.669***	0.701***	0.724***
	(0.045)	(0.049)	(0.047)	(0.102)	(0.100)	(0.103)
Log HQ Ex. Rate	-0.048			-0.078**		
× Abstract Task	(0.030)			(0.036)		
Log HQ Ex. Rate		0.045			-0.007	
× Routine Task		(0.051)			(0.033)	
Log HQ Ex. Rate			-0.045			0.058*
× Manual Task			(0.035)			(0.032)
Employer×Occ FE	Y	Y	Y	Y	Y	Y
Year FE	N	N	N	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	N	N	N
Observations	267,301	267,301	267,301	28,451	28,451	28,451
R-squared	0.888	0.888	0.888	0.988	0.988	0.988

Note: Panel A compares the differential impact of exchange rate shock in a home country on the firm wages based on the home-country×sector-specific exported output as a share of total output and the home-country×sector-specific imported input (intermediate goods) as a share of total input (intermediate goods), both in the foreign establishments (columns 1, 2 & 3) as well as the headquarters (columns 4, 5 & 6) of multinationals headquartered in that country. A home-country×sector is defined as highly output exporting (input importing) if its share of exported output (imported input) is above sample mean. The input/output shares are calculated using year-2004 data from the World Input-Output Database (WIOD) (Timmer *et al.* , 2015). For countries without country-specific information in WIOD, we take the worldly sector-specific averages.
Panel B compares the differential impact of exchange rate shock in a home country on the gross wages paid to occupations of high and low offshorability and of different task complexity, both in the foreign establishments (columns 1, 2 & 3) as well as the headquarters (columns 4, 5& 6) of multinationals headquartered in that country. . An occupation is defined as highly offshorable if its offshorablilty index is above the sample mean. The offshorability index is constructed according to Blinder & Krueger (2013). Occupations defined as single-task include: cleaner, messenger, guard, driver, data entry clerk, administrative clerk and shipping & receiving clerk.
Panel C compares the differential impact of exchange rate shock in a home country on the gross wages paid to occupations of high and low abstractness, routineness and manualness, both in the foreign establishments (columns 1, 2 & 3) as well as the headquarters (columns 3 4, & 5) of multinationals headquartered in that country.. An occupation is defined as abstract-task (routine-task, manual task) if its abstractness (routineness, manualness) index is above the sample mean. The abstractness, routineness, manualness indices are from Autor & Dorn (2013).
Exchange rates are detrended from home-country-specific time trends. All foreign establishments located in the same currency zone as the headquarters are excluded. Outliers with percentage wage changes larger than 50% are excluded. Standard errors are reported in parentheses and clustered at the home-country-currency-zone level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A15: IMPACT OF HQ EX. RATE SHOCKS ON FOREIGN ESTABLISHMENT EMPLOYMENT

	Panel A: Extensive Margin			
Data Source	the Company		*RAIS* (Brazil)	
Unit of Observation	estab×occ×year			
Dep. Var.	Occupation Present at Foreign Establishment			
Sample	All Occ.	Low-Skill Occ.		All Occ.
	(1)	(2)	(3)	(4)
Log HQ Ex. Rate	-0.054	-0.091	-0.077	-0.071
	(0.081)	(0.058)	(0.042)	(0.047)
Log HQ Ex. Rate	-0.016	0.103		
× HQ-Country Low Ineq. Aversion	(0.099)	(0.070)		
Log HQ Ex. Rate				-0.138
× Low-Skill Occ.				(0.143)
Employer×Estab.×Occ FE	Y	Y	Y	Y
Estab.-City×Year FE	Y	Y	Y	Y
Mean Dep. Var.	0.715	0.740	0.929	Low-Skill: 0.917 Med/High-Skill: 0.930
Observations	399,932	159,376	21,990	21,990

	Panel B: Intensive Margin	
Data Source	*RAIS* (Brazil)	
Unit of Observation	estab×worker×year	
Dep. Var.	Worker Employed	
	(1)	(2)
Log HQ Ex. Rate	0.003***	0.002***
	(0.001)	(0.001)
Log HQ Ex. Rate		0.002
× Low-Skill Occ.		(0.002)
Employer×Estab.×Worker FE	Y	Y
Estab.-City×Year FE	Y	Y
Worker Controls	Y	Y
Mean Dep. Var.	0.394	Low-Skill: 0.432 Med/High-Skill: 0.389
Observations	1,676,924	1,676,924

Note: This table shows impact that a 100% local currency depreciation (to USD) in an employer's home country has has on the existence of occupations (Panel A) and the employment of workers (Panel B) at the firm's foreign establishments. In Panel A, the outcome variable is a dummy variable indicating that an occupation is present in an establishment in the following year. In columns 1 & 2, an occupation is a job title defined by the Company (298 in total); in columns 3 & 4, the coding of occupations follows the Brazilian Classification of Occupations (*CBO2002*). In Panel B, the outcome variable in columns 1 & 2 is a dummy variable indicating that a worker is employed in an Brazilian establishment at the beginning of the following year. In columns 1-2 of Panel A, inequality aversion is defined according to the Hofstede measures of culture. If the variable "HQ-Country Low Ineq. Aversion" equals one, it indicates that the home country is more accepting of inequality than the average country in the sample of our main dataset. In Panel B and columns 3-4 of Panel A, almost all foreign establishments in Brazil in our sample are from multinationals headquartered in high inequality averse home countries. An occupation is low-skill if its skill level is between 1-5 (out of 16 skill levels). Standard errors are reported in parentheses and clustered at the home-country-currency-zone level. (*=p<0.10, **=p<0.05 ,***=p<0.01)

TABLE A16: IMPACT OF ESTAB. COUNTRY MIN. WAGE/ EX. RATE SHOCKS ON WAGES

	Estab.-Country Min. Wage Hikes		*Estab.-Country Ex. Rate Shocks*	
	%Δ HQ Wage	%Δ Estab. j Wage	Log HQ Wage	Log Estab. j Wage
	(1)	(2)	(3)	(4)
%Δ Min Wage at any Estab.	-0.005			
	(0.019)			
%Δ Min Wage at Estab. ($\neq j$)		0.000		
		(0.000)		
Log Ex. Rate at any Estab.			0.001	
			(0.001)	
Log Ex. Rate at Estab. ($\neq j$)				0.001
				(0.002)
Employer×Occ FE	Y	Y	Y	Y
HQ-City×Year FE	Y	-	Y	-
Estab. j-City×Year FE	-	Y	-	Y
Observations	846	52,377	5,273	350,011
R-squared	0.993	0.092	0.999	0.999

Note: This table shows the impact of a 100% minimum wage increase (columns 1 & 2) and a 100% currency depreciation (columns 3 & 4) in a firm's establishment country on the wages at the firm's headquarters (columns 1 & 3) and other establishments (columns 2 & 4). Exchange rates are detrended from home-country-specific time trends. Only low-skill jobs are included in columns 1 & 2. An occupation is low-skill if its skill level (defined globally by the Company, 16 skill levels in total) is between 1 and 5. Standard errors are reported in parentheses. In columns 1 & 2, standard errors are clustered at the home-country(state) level. In columns 3 & 4, standard errors are clustered at the home-country-currency-zone level. (*=p<0.10, **=p<0.05 ,***=p<0.01)