Do Companies Pay a Wage Penalty For Having Offshored?

Alina Grecu, Wolfgang Sofka, Marcus Møller Larsen and Torben Pedersen

ABSTRACT

We explore how companies with a history of offshoring are able to attract new employees in the future. We reason that offshoring decisions create unintended signals about job insecurity to companies' onshore labor markets. This signaling effect implies that offshoring companies must pay higher salaries for new hires compared to non-offshoring companies. We test our predictions on a sample of 7,971 matched, newly hired managers and professionals by offshoring and non-offshoring companies. Our results indicate a 3 to 7% wage penalty for offshoring companies. We conclude that offshoring is not just a challenging implementation task but it can also entail more general ramifications on the domestic labor market.

Keywords: Offshoring, hiring, wage penalty, hidden costs, signaling theory.

INTRODUCTION

Offshoring is a business practice that has attracted considerable public and scholarly attention over the last two decades (Contractor et al., 2010; Mudambi, 2008; Steinberg et al., 2017). While widely pursued as a an effective strategy to reduce labor costs (Manning, 2014), research highlights how many firms underestimate the actual costs of implementing offshoring activities in foreign locations (Larsen et al., 2013). For example, offshoring companies misjudge coordination and control costs (Dibbern et al., 2008; Srikanth & Puranam, 2011; Stringfellow et al., 2008), cultural differences in foreign locations (Blomqvist et al., 2015), and make cost estimation errors on the implementation success (Larsen, 2016). While extant research has primarily focused on outcomes confined to the foreign implementation of the offshoring activity, we know less about the consequences for the domestic organization. This is surprising given the public attention that such company actions recieve in the domestic media (e.g., Financial Times, 2019; New York Times, 2019; Reuters, 2017; Wall Street Journal, 2016).

In this article, we advance offshoring research by investigating whether a company's history of offshoring affects its ability to attract employees at home in the future. The importance of having highly qualified employees at home to coordinate and faciliate offshore activties is well documented in the literature (Srikanth & Puranam, 2011; Zimmermann & Ravishankar, 2016). Upon attracting new employees, however, research in recruitment and strategic human capital suggests that prospective employees take many sources of information into account when assessing the attractiveness of a potential employer (Kryscynski et al., 2020; Ryan et al., 2000). Accordingly, there is a risk that firms may underestimate the signaling effect to onshore labor markets when offshoring.

Theoretically, we place offshoring decisions into a broader context as an unintended but consequential signal to onshore labor markets (Connelly et al., 2011; Spence, 2002). We reason that the perceived association between offshoring and job losses (Hummels et al., 2014; Maertz et al., 2010) creates signals that cast doubts about job security in the offshoring company for prospective employees. This is an effective signal because it is widely observable in media coverage and shapes the prospective employees' perception about their potential work environment. To compensate new hires financially for

the perceived risk of joining an employer with comparatively lower job security (Rosen, 1986; Smith, 1979), we hypothesize that offshoring firms need to pay a wage penalty (i.e., higher wages) in the future compared with a reference group of firms with similar productivity levels, hiring similar individuals for similar jobs in the domestic labor market.

We test and find support for our wage penalty hypothesis for 7,971 newly hired employees in Denmark. We benefit from the combination of a survey targeting both offshoring and non-offshoring companies with the employment records of these companies based on Statistics Denmark's employer-employee register data. The merged dataset provides rich information about the surveyed companies' offshoring activities and the employees that they subsequently hire. Importantly, we obtain information on hiring wages for both offshoring and non-offshoring companies. We employ a comprehensive estimation strategy which takes into account that offshoring companies and the individuals that they are hiring are not randomly or exogenously assigned. We rely on Coarsened Exact Matching (CEM) combined with Mincer-type wage regressions and provide robustness analyses with Propensity Score Matching techniques as well as instrument variable approaches to arrive at reliable empirical results. Results indicate that offshoring firms pay wage penalties in the range of 3 to 7% (depending on the stringency of the matching) compared with comparable non-offshoring firms hiring similar individuals for equivalent jobs.

We claim two contributions with our research. First, we close a blind spot in the literature on the unintended consequences of offshoring (Kotabe et al., 2008; Larsen et al., 2013; Stringfellow et al., 2008) by emphasizing how companies' offshoring decisions affect their future ability to hire at home. We find that the inability of firms to anticipate the consequences of offshoring decisions is not narrowly confined to the offshoring context but extends to its attractiveness on the domestic labor markets. We identify substantial wage penalties from offshoring signals to future hires, which constitute a cost that should be factored into offshoring decisions. Second, unintended signals conveying negative information are an understudied aspect of signal theory (Connelly et al., 2011). We delineate the mechanisms by which offshoring creates unintended, yet effective signals to labor markets that may undermine firms' ability to attract qualified labor and eventually deteriorate their performance (Raffiee & Coff, 2016). This

theoretical logic can therefore serve as a basis for future studies exploring the performance heterogeneity of firms' internationalization decisions (e.g., Pisani et al., 2020).

THEORY AND HYPOTHESIS

The unintended consequences of offshoring

Offshoring can be defined as the relocation of business activities to foreign locations (Manning, 2014). Together with access to new talent and market proximity, opportunities for cost arbitrage have traditionally been among the main drivers for offshoring (Größler et al., 2013; Kinkel, 2012). However, recent studies explore the adverse consequences of offshoring, and indicate the existence of 'hidden' or 'invisible' costs of relocating business activities abroad. Larsen et al. (2013) define hidden costs as *"implementation costs that are not anticipated in the various stages of strategic decision making"* (p. 534*).* For example, firms may experience that local labor costs increase beyond expectations and that offshoring operations require substantially more knowledge transfer, control and supervision of production processes than originally anticipated (Larsen et al., 2013; Stringfellow et al., 2008).

The challenge of predicting the consequences of offshoring decisions accurately and comprehensively is well documented (see Table 1 for a summary of the literature on offshoring intended and unintended consequences). As Table 1 indicates, the consensus of this existing research is incomplete in two meaningful ways. First, it assumes at least implicitly that the effects of offshoring are limited to the intended employment consequences (e.g., lowering wages or accessing new talent pools abroad). Second, the unintended consequences are not limited to the firm's current employees but extend to the labor market of future hires.

<<Insert Table 1 about here>>

Based on the assumptions of bounded rationality, unintended consequences or "post-decision" surprises (Harrison & March, 1984) are typically conceived as affecting the efficiency with which specific offshoring activities can be implemented. We build on this research by exploring how offshoring decisions can produce unintended consequences for a company's domestic attractiveness as employers. In this respect, heterogeneous firm theories may suggest that productivity advantages can translate into employer

attractiveness because productive companies can pay comparatively higher wages (Jovanovic, 1982; Redding, 2011). Relatedly, research in labor economics explores how the wages of the onshore employees are affected by offshoring, with studies showing that more knowledge intensive jobs in the onshore location tend to receive higher wages (Hummels et al., 2014).

Unintended signaling effects of offshoring decisions to onshore labor markets

To understand the labor market effect of companies' offshoring decisions, we draw on signaling theory. The basic idea of signaling theory is that a signaler (e.g., person, product, or company) has some underlying qualities that the receiver interprets and offer feedback to the signaler (Connelly et al., 2011). Within the recruitment literature, signaling theory is used to explain how applicant attraction occurs, and can be divided into two streams of research. The first stream focuses on employee-to-employer signals used by employers as a proxy for the unobserved "productive capabilities" by looking at educational achievements or experience of individuals (Spence, 1973). The second stream (i.e., employer-to-employee signals) explores company-level signalers, by focusing on how job seekers perceive certain company characteristics as proxies for unobservable qualities (Ryan et al., 2000). Of particular interest to our study is the latter stream, and the extent to which negative and positive company signals induce companies to pay higher or lower wages (for an overview of the literature, see the online supplementary materials Appendix A). Prior research shows that there are positive signals (such as being a socially responsible company) that enable organizations to pay less and employees to give up pecuniary benefits in return for non-pecuinary ones (Burbano, 2016). Conversely, there are also negative signals that can make employers look less attractive. For example, research finds that less attractive employers pay higher penalties for unsafe working conditions (Cousineau et al., 1992; Dale-Olsen, 2006; Deleire & Levy, 2004).

We reason that offshoring decisions and the information that they reveal to labor markets can be regarded as unintentional signals that are not designed to communicate negative attributes of firms to a specific audience (Connelly et al., 2011). Unintentional signals are likely to occur because firms are often unaware about the information that their behaviour and actions reveals (Spence, 2002). Given the unintended nature of offshoring signals, the interpretation by the signal receivers is central for our logic.

Connelly et al. (2011) define receiver interpretation as “the process of translating signals into perceived meaning (p. 54)”. This process depends on the strength of the signal and on what the receiver infers from the signal (Branzei et al., 2004).

Signal strength matters for the interpretation of signals because receivers are selective in the degree to which they respond to some signals but not others. This selection occurs through cognitive filters where weak signals might not be captured by potential receivers, adequately processed or entering their decision making (Ilmola & Kuusi, 2006). While offshoring is an unintentional signal to domestic labor markets, it is strong in its potential to reach prospective employees because of its observability. Offshoring constitutes a major act of reorganization and offshoring decisions are often irreversible (Overby, 2003). While smaller organizational changes (e.g., on department structures) are likely to go unnoticed outside of the firm, offshoring can result in substantial job losses or plant closures (Maertz et al., 2010). Given the magnitude of these consequences, offshoring decisions are more likely enter the public discussion (e.g., through union protests, as political talking points, or in media coverage; see also Appendix B for an illustration of the job-related issues appearing in news articles about offshoring). Hence, information about offshoring is easily accessible to potential applicants on job markets and likely to cross their cognitive filters.

The signal intepretation process continues with receivers deciding on the meaning of the signal. Within our context, prospective employees create a perception of the work environment of a potential employer based on the information that is available to them (Ehrhart & Ziegert, 2005). This perception is necessarily different from the actual work environment which would only be observable for a current employee with comprehensive and objective information. Instead, individuals make inferences from behaviour that is observable to them (Srivastava, 2001). Rynes (1991) describes how applicants take cues from firm actions and make inferences, which extend to general firm behaviours affecting its perceived attractiveness as an employer (Turban & Greening, 1996). The perceived attractiveness can also be symbolic in the sense that prospective employees may not want to be associated with employers signaling undersirable qualities (Highhouse et al., 2007).

The interpretation of a signal is embedded in a set of collective beliefs about the signal (Connelly et al., 2011). These collective beliefs create an environment in which individuals assign meaning to signals (Park & Mezias, 2005). In this regard, it is important for our reasoning that offshoring is typically associated with job insecurity in media coverage or political disussions which can constitute collective beliefs. Accordingly, it is irrelevant for the inference effect of an offshoring signal on prospective employees whether the focal firm objectively considers to offshore more jobs in the future or not since this intent is not observable. Instead, the interpretation of the offshoring signal depends on the association with job losses by other firms which have frequently occurred (Hummels et al., 2014; Maertz et al., 2010) and are well covered by the media. Given that job security with an employer is an important quality characteristic for many prospective applicants on labor markets (Trevor & Nyberg, 2008), offshoring firms are at an attractiveness disadvantage relative to potential employers without an offshoring signal that might be interpreted as lower job security.

Taken together, we argue that offshoring decisions create unintended signals to prospective employees on labor markets. They create strong signals which are easily observable through media coverage and political discourse. Prospective employees are likely to interpret offshoring as a signal for job insecurity of a potential employer given how closely it is associated with job losses in the collective beliefs of society. In accepting employment with lower job security, prospective employees can expect comparatively higher salaries (Smith, 1979). Thus, the compensating differentials create a wage penalty for offshoring companies compared with otherwise comparable employers hiring similar employees for the same type of jobs. This argument leads us to our hypothesis:

> *Offshoring companies pay a wage penalty to newly hired employees compared to non-offshoring companies.*

METHODS

Sample and data

We test our hypothesis for companies and employees in Denmark. Denmark is an appropriate setting for studying the subject since it is one of the least restrictive countries in Europe in terms of labor market

policies with a flexible wage-setting (Bingley & Westergaard-Nielsen, 2003; Hummels et al., 2014; Sorensen & Sorenson, 2007). We benefit from the opportunity to merge two sources of data, which allows us to capture the influence of offshoring decisions on the wages of newly hired employees, by combining a survey on company level offshoring experience with matched employer-employee register data.

The survey was collected through an online questionnaire in October 2011 by the Global Operations Network (a research network of Scandinavian universities) with the purpose of understanding companies' offshoring activities. Offshoring is defined in the survey consistent with our theoretical definition: whether the company has relocated any activities from Denmark abroad. The entire population consisted of Danish companies with more than 50 employees across industries (2,856 Danish companies) identified in the publicly available database CD-Direct. The response rate for this online questionnaire is 24%, and non-response bias tests based on secondary data from the same database suggest that responding and non-responding companies seem to be rather similar in terms of a variety of characteristics[1]. The respondents (typically CEOs, COOs, production managers, or HR managers) report information on the strategy and their last offshoring implementation.

Through the survey data, we are able to overcome some of empirical challenges often found in prior offshoring studies. First, we can reliably identify companies that are engaged in offshoring instead of using proxies such as changes in imported goods (Horgos, 2009). Second, the survey contains information about offshoring characteristics, which is otherwise difficult to observe. Third, the sampling of the survey allows a direct merge through a unique company identification number with the extensive Danish register data (i.e., Statistics Denmark). The use of this data source for research published in leading management journals has increased (Grimpe et al., 2019; Kaiser et al., 2018) due to its completeness and the richness of the data (see Timmermans (2010) for a description of the Danish register data). The register data allows us to identify a rich set of variables describing the education and employment records of individuals, including their job functions and wages before and after taking up the new job.

[1] Turnover, total assets, annual results, industry, and location.

We link the survey information to employment data in the surveyed companies for the time period 2000-2014. This timeframe not only encapsulates the offshoring implementations captured by the survey, but also provides us with the opportunity to observe the employment records of companies and individuals[2]. Given that our hypothesis focuses on newly hired employees, each individual is observed only in their first year in a company, and we restrict our sample of hires post-offshoring to three years. This ensures that our empirical sample will include "treated" individuals that are hired in the immediate time period of the offshoring implementation, reasonably close in time, so the effects can be attributed to offshoring. Further, we choose to empirically test our hypothesis on the occupation levels 1, 2, and 3 as defined by the Danish version of the International Standard Classification of Occupations (DISCO). These individuals are classified as having a professional or managerial tasks and have been the primary focus of other studies focusing on hiring decisions and their outcomes (Distel et al., 2019; Sofka et al., 2021). We choose to do so because managers and professionals hired in occupations that require high degrees of knowledge have strategic value (Raffiee & Coff, 2016).

Variables

Our dependent variable is the natural logarithm of hourly wage for a newly hired employee. Ideally, we would like to track the wage that the employee was offered and the other job offers that he/she was considering. However, this information is not available. Instead, we assume that given suitable controls for job functions and regional boundaries, labor markets are efficient which implies that the wage of the employee in the new job is the maximum that he/she could bargain for and the maximum that the hiring company was willing to pay. Given our set of control variables, higher wages for newly hired employees indicate a wage penalty paid by the hiring company.

The main independent variable in our model is a dummy variable for whether the newly hired employee is joining a company that has offshored in the past 3 years or not. Accordingly, we have a matched group of newly hired employees by companies which have not offshored during this period.

[2] Companies will only be observed if they hire new employees.

We include individual, company and labor market control variables in our regressions (see Appendix C in online supplementary materials for an operationalization of all variables in our models). For individual characteristics, human capital theory identifies formal education and labor market experience as key predictors for pay levels (Mincer & Polachek, 1974). In addition to individuals' skills and competencies, job level characteristics and hierarchical levels also matter (Gerhart & Milkovich, 1990). Here we have the occupation codes (DISCO 2-digit), and construct a dummy variable based on the DISCO codes that takes the value 1 if the newly hired employee is hired for a top management position. We include a gender dummy, as previous studies show that females earn less than their male colleagues (Blau & Kahn, 2007; Frank, 1978).

Unobserved differences in employees' quality may lead to an overestimation of the wage penalties (Almeida, 2006), as the quality could be related to individuals' abilities. Cognitive abilities are known to affect wages for skilled workers (Lindqvist & Vestman, 2011), but unfortunately such information is rarely available in the register data. Instead, we address this issue of unobservable factors with the use of income decile variables in the individual's previous employment to account for any remaining differences in quality among individuals that may drive the wage penalties. This is an approach used also by other studies explaining wage differences among newly hired employees' wages (Grimpe et al., 2019). Relying on deciles has the advantage that absolute wage levels in previous jobs might capture industry or company specific labor market conditions instead of differences in the quality of individuals.

For company-level control variables, larger companies have been found to pay higher wages (Burton et al., 2018) and companies with higher wages self-select into export markets (Schank et al., 2008). In addition, heterogeneous firm theories suggest that there is a close link between trade and income (Redding, 2011) and that efficiency is learned over time (Jovanovic, 1982). Thus, as controls we include company age, workplace size, productivity (sales/employee), and whether the company has export experience. Further, we control for the presence of other signals being sent by the companies which could indicate that they might share rents with their employees. Therefore, we include three more dummy variables: cost-leadership orientation, profitability and ownership. Besides, fluctuations in the external

labor market may be associated with fluctuations in wages for newly hired employees (Galuscak et al., 2012), and certain geographical areas may offer more opportunities than others do (Combes et al., 2011). Hence, we include the region, sector and hiring year as controls in all our regressions.

Empirical strategy

We test our hypothesis by estimating Mincer-type wage regressions. However, given our empirical setting, we need to take into account potential biases from unobserved factors affecting both the decision to offshore and company hiring. We tackle these issues by using matching techniques, and we provide robustness analyses with an instrument variable approach.

We use observational data for which there is no random assignment to the offshoring treatment. We address this issue by deploying a Coarsened Exact Matching (CEM) technique, similarly to other recent studies predicting wage differences (Grimpe et al., 2019). This way we can mimic an experimental setting by adjusting the weights of observations to make sure we compare similar control and treated groups (for more details, see Iacus et al., 2012). The goal of the CEM approach is to obtain weights for each observation so that treated observations (i.e., those individuals hired by companies with offshoring history) are no longer significantly different from the control group based on a set of conditioning variables after weights are applied.

We generate weights through various matching specifications. As conditioning variables in our matching procedures, we include a detailed 2-digits occupation code for the new job to make sure that treated and control group are hired for the same job function. Besides, we add a broad set of individual, company, and regional level variables. At the individual level, we condition on a dummy variable for whether the employee has achieved college education and his/her income decile in the previous job. In addition, we match on the size of the hiring workplace, exporting experience, and we coarsen on company productivity. Finally, we also match exactly on the region of the country and year of the hiring event. As consistency check analyses, we employ different propensity score matching (PSM) techniques as well as instrument variable regressions—which are recommended empirical tools for dealing with endogeneity in international business research (Reeb et al., 2012).

FINDINGS

Summary statistics

Our estimation sample consists of 446 companies hiring at least one employee. These companies operate mostly (57.63%) in two industries: 'Trade and transport' and 'Manufacturing'. Out of the 446 companies, 32% are offshoring companies, approximately 70% of them report that their last offshoring implementation took place in 2009, 2010 or 2011, and 24.4% are part of a foreign group. At the employee level, the final sample contains 27,900 newly hired employees by offshoring companies within three years of the offshoring event and companies that have reported no offshoring activity.

Table 2 shows descriptive statistics for newly hired employees in offshoring and non-offshoring companies. Post-offshoring, the offshoring companies pay on average 330 DKK to newly hired employees, whereas companies without an offshoring history pay on average 274 DKK. With an average of 16 years of working experience, newly hired employees in offshoring companies do not differ compared to non-offshoring companies' new hires. However, employees hired in offshoring companies are more likely to have college education, to have had higher wage levels in their previous working experience, and join exporting companies to a larger extent. Overall, the descriptive statistics indicate that matching or instrument variable approaches are warranted to isolate the effects of offshoring from other company/individual-level differences. Table 3 shows the correlations between the main variables in our estimation models. We inspect the variance inflation factors (VIF) for the main variables and find no indication for multicollinearity with an average VIF of 1.19 and a maximum VIF of 1.56.

<<Insert Table 2 and Table 3 about here>>

Results using CEM models

We deploy a set of wage regressions with varying degrees of restrictiveness in the matching procedure to demonstrate the stability of results. Table 4 shows the results of the test of our hypothesis for different matching specifications. All of the models support the hypothesis as we find that wage penalties are paid by offshoring companies. Model 1 shows the results without any matching weights applied, resulting in the maximum sample of 27,900 newly hired individuals for which we predict wages. In Model 2, we use

CEM weights obtained through an exact matching technique that includes the following as conditioning variables: occupation codes, company size type (i.e., small, medium, large), export experience, region and year. In Model 3, we additionally exactly match on college education, whereas in Model 4 we also exactly match on employees' previous income deciles. With this approach, we can alleviate concerns about biases emerging from alternative explanation based on unobserved characteristics such as individuals' ability or quality of the employee in their previous job. Model 5 includes workplace size instead of company size type as conditioning variable, whereas Model 6 uses additionally productivity as conditioning variable. By including company productivity as a conditioning variable, we can also reduce potential concerns about biases emerging from efficiency concerns (Redding, 2011). Given the richness of the data, we can still obtain 7,971 comparable individuals after using the most restrictive matching approach. This highly restrictive matched sample represents new hires in 361 companies (37% of these are companies with a recent history of offshoring).

For assessing the quality of the matching procedure, we apply probit estimations predicting the likelihood of selection into treatment (i.e., being hired by a company with an offshoring history). We include all conditioning variables as explanatory variables in this probit estimation (see Appendix D), and show that our treatment and control samples are balanced with regard to the offshoring treatment.

<<Insert Table 4 about here>>

Taken together, all specifications presented in Table 4 support our hypothesis. We find that offshoring companies pay on average higher hourly wages to newly hired employees. The effect in the most restrictive matching approach is economically substantial since it implies a 7% (exp(0.068)-1=0.070) wage penalty for companies with offshoring experience. As predicted, the wage penalties that offshoring firms have to pay to attract new hires in the future are substantial in magnitude even when the heterogeneity among companies, employees, and labor markets is taken into account.

In order to further test our mechanism, we examine whether the effect of company offshoring on the wages of newly hired employees varies significantly across groups of employees for whom job insecurity should be more salient. Empirically, we look at newly hired employees' bank debt and test

whether offshoring companies need to pay even higher wage penalties to newly hired employees that have higher levels of bank debt as they are expected to value job and income security highly. This within-group heterogeneity is likely to affect an individual's sensitivity to job insecurity but unlikely to affect the wage setting of offshoring companies. Our expectation is confirmed, which implies that our research hypothesis is in line with the arguments about job insecurity (See online Appendix E, Model 2).

Robustness analyses

We conduct a series of consistency checks by replacing the CEM approach with propensity score matching (PSM) techniques using the same set of variables (Appendix F in online supplementary materials provides details). All PSM models support our hypothesis but the effect size with the most restrictive PSM technique is smaller, i.e. 2.3% (exp(0.023)-1= 0.023).

Further, we provide results for additional regression specifications (including the CEM weights) in Table 5. First, we test our hypothesis for the post 2008 period only (Model 7). Second, we check whether there is a dynamic structure of the wage penalty, given that we look at the wages post-offshoring. In Models 8a-8f in Table 5, we see that there is no significant difference between the wages of new hires in offshoring and non-offshoring companies prior to the offshoring event, but that the wage penalty is salient post-offshoring. This is consistent with our theoretical mechanism since the offshoring signal increases in signaling strength only when it becomes known to the public, and consequently prospective employees. Third, we find support for our findings also if we go beyond industry, time and/or regional dummies and control additionally for specific labor market conditions (see Model 9 of Table 5). More specifically, job security concerns might be particularly salient in industries and/or local labor markets in which many jobs are lost. Hence, we construct two additional control variables: number of employees losing their job in the 6-digit industry code of the focal company, and the share of unemployed people in the focal company's municipality (even more fine grained than regions). Even after controlling for these two additional factors, we still find the significant offshoring wage penalty.

<<Insert Table 5 about here>>

Lastly, we test the reliability of the matching results by employing an instrumental variable approach. Following trade literature, we identify transportation costs and distances to transportation points as suitable instruments when examining the effect of trade on income (Frankel & Romer, 1999). Empirically, we calculate the travel time (i.e., how many minutes it takes to drive the latter distance under normal traffic conditions (Weber & Péclat, 2017)) from a company's municipality to the five biggest Danish seaports: Copenhagen, Aarhus, Fredericia, Aalborg and Esbjerg. Denmark has multiple seaports used by companies to import and export goods internationally and companies in the proximity of seaports have higher ex-ante opportunities to benefit from offshoring. Then again, companies' geographical location with respect to seaports is unlikely to affect wages (i.e., the dependent variable of our hypothesized relationship). Model 1 in Online Appendix G shows the first stage regression having offshoring as the dependent variable, and Model 2 shows the second stage wage regression. All control variables are identical and in line with the matching based approaches. Focusing on the second stage, wage regression testing of our hypothesis, we find support for the wage penalty hypothesis. The effect of offshoring is significant and substantial in magnitude corresponding to a wage penalty of around 10% (p-value 0.026).

DISCUSSION AND CONCLUSION

Theoretical implications

With this study, we make important contributions to existing literature along two dimensions. First, we contribute to the literature on the unintended consequences of offshoring (Larsen et al., 2013; Stringfellow et al., 2008) by emphasizing how companies' offshoring decisions affect their future ability to hire domestically. This is an important extension of existing research, which has largely focused on the detrimental consequences for the implementation of the offshored activity. Our theorizing is not confined to a particular activity, and explores instead the consequences for the company' future hiring.

Indeed, prior research on offshoring stresses the importance of having highly qualified domestic employees to coordinate and control the work conducted at offshore locations (Srikanth & Puranam, 2011; Zimmermann & Ravishankar, 2016). The complex interdepedendencies between onshore and offshore

locations require qualified emloyees that can facilitate efficient coordination and knowledge transfer. Yet, less is known about the consequences for firms' ability to attract qualified employees after deciding to offshore. We present a model that incorporates the unintended signaling effects of offshoring with compensating wage differentials for prospective employees. We theorize that offshoring sends negative, salient and visible signals of job insecurity to prospective employees, and that this signal can explain wage differences between newly hired employees in offshoring firms versus non-offshoring firms.

Our findings show that offshoring companies pay 3-7% penalty when hiring. As such, we propose that domestic labor market reactions to firms' offshoring decisions constitute company-wide 'hidden costs' of offshoring (Larsen et al., 2013). Correspondingly, we contribute to extant research that emphasize inability of decision makers to account for relevant cost considerations when offshoring. This theoretical logic should therefore be valuable for future studies exploring other important strategic internationalization decisions, such as the relocation of corporate headquarters (Birkinshaw et al., 2006) or the entry into political fragile markets (Witte et al., 2017).

Second, we contribute by delineating how unintended signaling effects that convey negative information may cause damage to firms' attractiveness and ultimately performance (Raffiee & Coff, 2016). While being an understudied aspect of signal theory (Connelly et al., 2011), we tease out how the mechanisms (i.e., signal observablity and receiver inference) by which offshoring creates unintended, yet effective signals to labor markets, and result in wage penalties. By stressing how new information is interpreted after strategic decisions are being made and their consequences are experienced (Harrison & March, 1984), we suggest that the offshoring decision with its implications for hiring and wages in the onshore location offers a particularly salient signal. These insights are important for research that seeks to understand the performance heterogeneity of firms' internationalization efforts. For example, there have been many attempts in international business research to explain the relationship between a firm's multinationality and firm performance (e.g., Berry & Kaul (2016); Lu & Beamish (2004), although with only mixed empirical success (Verbeke & Forootan, 2012). As traditional performance measures typically capture net effects of firms' internationalization (including offshoring) decisions, it becomes difficult to

disentangle positive effects from counterproductive ones. Instead, we offer a model that illustrates how domestic labor markets can produce unintended consequences that are only indirectly related to the directly observed outcomes of the strategic decisions. Similar to our approach, future research could therefore more systematically unravel the sources of performance heterogeneity based on visible internationalization decisions.

Practical implications

Our results indicate that offshoring is associated with higher costs of hiring and this has substantial implications for practice. Previous studies looking at company signals and wages find comparable wage penalties. For example, French & Dunlap (1998) finds that between 3 and 10% wage penalty can be attributed to degree of mental stress in a company. If we focus as a reference on the Danish occupational code DISCO 25 (i.e., work that requires knowledge on highest level in IT and communication), a company without offshoring history would typically pay to a new hire the average salary[3] of approx. 93,000 EUR per year, then our model predicts that a similar company with a recent history of offshoring will pay a penalty ranging between 3% (2,790 EUR) and 7% (6,510 EUR) to a similar employee. Another perspective for comparison is the annual salary increase for this group of employees, which according to the official statistics corresponds to around 2% per year. All in all, a wage penalty for having offshored is substantial and not negligible for companies. Hence, our study can make managers aware that they need to counter offshoring signals on onshore labor markets if they want to be perceived as secure employers for the future; e.g., by publicizing long-term career trajectories in the company.

Limitations and future research

The results of our research should be assessed in the light of its limitations. First, while exploiting the unique data of the Danish labor market, we acknowledge that a cross-country comparison study could be a fruitful research path. The Danish welfare state, the level of technological development and unions may be a particular context that allows prospective employees to have access to information and form perceptions

[3] Salary by occupation code statistics (Danmarks Statistik, https://www.statistikbanken.dk/)

based on observable signals. Future research could therefore replicate our model in different empirical contexts. For example, as companies' offshoring patterns differ across the world, our model could be improved by controlling for type of country and welfare conditions.

Second, individual risk preferences, the type of offshoring, the offshoring destination, or how companies decide to organize their activities globally may play a role when prospective employees apply for jobs. We do not theorize about these aspects because a different empirical setting would have been needed. Newly hired employee surveys or experiments may be fruitful empirical setting for advancing our understanding about who are the types of employees who favor job security over monetary benefits, when they join a company with offshoring history.

Lastly, our theoretical model introduces linkages between offshoring signals, negative publicity, company attractiveness, and wage differentials. Our empirical setting—albeit rich in information—does not allow us to identify companies' names and link the survey information to media reports or news coverage. Company name and reputation may also act as signals for employer quality (Fombrun & Shanley, 1990). Thus, qualitative studies can try to disentangle the effect of offshoring on how prospective employees perceive company attractiveness, by studying also the importance of such aspects. Future studies can also expand our model and theorize on the effects of compensating wage differentials on companies' decisions to increase or decrease the degree of internationalization. For example, future studies can analyze the impact of backshoring decisions on the wages of newly hired employees, to understand whether "bringing jobs back" initiatives (Financial Times, 2019; New York Times, 2019) receive positive media attention and have a positive or negative effect on wages.

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TABLES

Table 1. Intended and unintended offshoring consequences

		Intended consequences		Unintended consequesnces	
		Topic	*Indicative literature*	*Topic*	*Indicative literature*
Firm level	Financial	Cost cutting and economies of scale	Größler et al., 2013; Jensen Ørberg & Pedersen, 2011	Cost estimation errors	Larsen et al., 2013; Larsen, 2016
	Strategic	Performance and competitive advantage	Bertrand & Bertrand, 2011; Kotabe & Mudambi, 2009; Mol et al., 2005; Mudambi, 2008; Murray et al., 2005	Control, coordination and knowledge transfer issues	Dibbern et al., 2008; Kumar et al., 2009; Srikanth & Puranam, 2011; Stringfellow et al., 2008
Employee level	Existing	Skill composition, employment and wages	Hummels et al., 2014; Tambe & Hitt, 2012; Wright, 2014	Turnover, motivation and job insecurity	Betts et al., 2015; Demirbag et al., 2012; Geishecker, 2008; Zimmermann & Ravishankar, 2016
	New	Access to qualified workforce	Lewin et al., 2009	Employer reputation and hiring	-

Table 2. Descriptive statistics

	Newly hired employees		Employees hired in non-offshoring companies		Employees hired in offshoring companies	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Hourly wage (DKK)	289.915	(383.762)	273.491	(373.493)	329.728	(404.851)
Offshoring(d)	0.292	(0.455)	0.000	(0.000)	1.000	(0.000)
College educated(d)	0.488	(0.500)	0.438	(0.496)	0.609	(0.488)
Female (d)	0.386	(0.487)	0.358	(0.480)	0.454	(0.498)
TMT member (d)	0.102	(0.303)	0.121	(0.326)	0.057	(0.233)
Work experience (Years)	15.677	(8.928)	15.606	(8.821)	15.848	(9.179)
Prev. inc. 1st decile	0.107	(0.310)	0.108	(0.311)	0.106	(0.307)
Prev. inc. 2nd decile	0.058	(0.233)	0.060	(0.238)	0.051	(0.219)
Prev. inc. 3rd decile	0.094	(0.292)	0.095	(0.294)	0.091	(0.287)
Prev. inc. 4th decile	0.065	(0.247)	0.072	(0.259)	0.049	(0.217)
Prev. inc. 5th decile	0.046	(0.209)	0.054	(0.226)	0.027	(0.162)
Prev. inc. 6th decile	0.049	(0.216)	0.058	(0.234)	0.027	(0.162)
Prev. inc. 7th decile	0.068	(0.252)	0.076	(0.265)	0.049	(0.216)
Prev. inc. 8th decile	0.100	(0.299)	0.104	(0.305)	0.090	(0.286)
Prev. inc. 9th decile	0.158	(0.365)	0.148	(0.355)	0.182	(0.386)
Prev. inc. 10th decile	0.255	(0.436)	0.225	(0.417)	0.329	(0.470)
Firm age (years)	30.128	(24.633)	23.550	(19.885)	46.074	(27.569)
Exporter(d)	0.732	(0.443)	0.639	(0.480)	0.958	(0.201)
Prior firm avg. wages	254.839	(101.500)	248.110	(113.874)	271.151	(58.877)
No. employees workplace	567.974	(867.294)	297.219	(401.876)	1224.327	(1255.286)
Productivity	1991.727	(2336.152)	1792.036	(2356.035)	2475.811	(2213.834)
Profitable (d)	0.837	(0.369)	0.824	(0.381)	0.869	(0.337)
Cost leadership(d)	0.302	(0.459)	0.362	(0.481)	0.158	(0.365)
Domestic(d)	0.763	(0.425)	0.734	(0.442)	0.834	(0.372)
Agr., mining and quarrying	0.007	(0.084)	0.004	(0.065)	0.014	(0.117)
Manufacturing	0.244	(0.430)	0.101	(0.302)	0.591	(0.492)
Construction	0.101	(0.301)	0.142	(0.349)	0.001	(0.027)
Trade and transport	0.212	(0.409)	0.274	(0.446)	0.060	(0.238)
Information and communication	0.147	(0.354)	0.166	(0.372)	0.102	(0.302)
Financial and insurance	0.003	(0.056)	0.004	(0.065)	0.000	(0.016)
Real estate	0.017	(0.128)	0.022	(0.147)	0.004	(0.060)
Other business services	0.268	(0.443)	0.284	(0.451)	0.229	(0.420)
Public adm., educ., and health	0.001	(0.024)	0.001	(0.028)	0.000	(0.000)
Arts, entertainment and other services	0.001	(0.022)	0.001	(0.027)	0.000	(0.000)
Northern region	0.068	(0.252)	0.086	(0.281)	0.023	(0.149)
Central region	0.215	(0.411)	0.217	(0.412)	0.208	(0.406)
Southern region	0.121	(0.326)	0.117	(0.322)	0.129	(0.335)
Capital region	0.568	(0.495)	0.545	(0.498)	0.623	(0.485)
Zealand area	0.029	(0.169)	0.034	(0.182)	0.017	(0.129)
Observations	**27,900**		**19,752**		**8,148**	

Table 3. Correlations for main variables

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	Offshoring(d)	1.00												
(2)	College educated(d)	0.16	1.00											
(3)	Female (d)	0.09	-0.01	1.00										
(4)	TMT member (d)	-0.09	-0.01	-0.12	1.00									
(5)	Work experience (Years)	0.01	-0.14	-0.06	0.14	1.00								
(6)	Firm age (years)	0.42	0.05	0.12	-0.04	0.04	1.00							
(7)	Exporter(d)	0.33	0.11	-0.01	-0.05	0.01	0.22	1.00						
(8)	Prior firm avg. wages	0.10	0.14	-0.05	-0.05	-0.01	0.01	0.04	1.00					
(9)	No. empl. workplace	0.49	0.10	0.14	-0.08	-0.02	0.46	0.18	-0.02	1.00				
(10)	Sales/employee	0.13	0.02	-0.00	0.01	0.02	0.21	0.17	0.22	0.04	1.00			
(11)	Profitable (d)	0.06	0.03	0.06	-0.04	-0.03	0.08	0.05	-0.11	0.14	0.05	1.00		
(12)	Cost leadership(d)	-0.20	-0.04	-0.04	0.04	-0.03	-0.09	-0.16	-0.01	-0.21	-0.05	-0.16	1.00	
(13)	Domestic(d)	0.11	-0.02	0.04	-0.01	0.03	0.16	-0.03	-0.07	0.17	-0.11	-0.03	0.11	1.00
	Observations	**27,900**												

Table 4. Wage regression results obtained through different CEM matching specifications [a b c]

	Model 1	Model 2:	Model 3	Model 4	Model 5	Model 6
Matching approach	**No matching**	**Basic**	**Advanced**	**Elevated**	**Restrictive**	**Highly restrictive**
Offshoring(d)	0.023	0.032	0.041	0.047	0.067	0.068
	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)	(0.011)
	[0.005]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
College educated(d)	0.114	0.120	0.124	0.116	0.129	0.129
	(0.006)	(0.007)	(0.008)	(0.010)	(0.012)	(0.012)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Female (d)	-0.104	-0.093	-0.097	-0.111	-0.098	-0.100
	(0.006)	(0.007)	(0.008)	(0.010)	(0.011)	(0.012)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
TMT member (d)	0.215	0.852	0.811	0.925	0.829	0.842
	(0.086)	(0.050)	(0.056)	(0.076)	(0.067)	(0.068)
	[0.013]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Work experience (Years)	0.017	0.009	0.008	0.007	0.013	0.013
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]
Work experience^2	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.130]	[0.801]	[0.937]	[0.046]	[0.035]
Previous income deciles	Yes	Yes	Yes	Yes	Yes	Yes
Occupation codes	Yes	Yes	Yes	Yes	Yes	Yes
Prior firm avg. wages	0.000	0.001	0.001	0.001	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Workplace size	-0.000	-0.000	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.457]	[0.084]	[0.231]	[0.249]	[0.000]	[0.000]

	Model 1	Model 2:	Model 3	Model 4	Model 5	Model 6
Matching approach	**No matching**	**Basic**	**Advanced**	**Elevated**	**Restrictive**	**Highly restrictive**
Productivity	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.000]	[0.022]	[0.189]	[0.344]
Firm age (years)	-0.000	0.000	-0.000	-0.000	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.285]	[0.775]	[0.944]	[0.463]	[0.003]	[0.005]
Exporter(d)	0.029	0.052	0.065	0.096	0.061	0.067
	(0.007)	(0.020)	(0.021)	(0.030)	(0.027)	(0.028)
	[0.000]	[0.012]	[0.002]	[0.001]	[0.022]	[0.016]
Domestic(d)	0.016	0.002	-0.000	0.018	0.012	0.011
	(0.007)	(0.009)	(0.010)	(0.012)	(0.013)	(0.013)
	[0.018]	[0.817]	[0.973]	[0.146]	[0.323]	[0.373]
Cost leadership(d)	-0.016	-0.022	-0.021	-0.022	0.003	0.002
	(0.007)	(0.009)	(0.010)	(0.012)	(0.012)	(0.012)
	[0.019]	[0.019]	[0.030]	[0.076]	[0.820]	[0.885]
Profitable (d)	-0.038	-0.083	-0.087	-0.097	-0.102	-0.096
	(0.007)	(0.011)	(0.012)	(0.015)	(0.015)	(0.015)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Main sector	Yes	Yes	Yes	Yes	Yes	Yes
Hiring year	Yes	Yes	Yes	Yes	Yes	Yes
Region	Yes	Yes	Yes	Yes	Yes	Yes
Constant	4.617	4.498	4.519	4.747	4.726	4.646
	(0.048)	(0.169)	(0.173)	(0.268)	(0.309)	(0.320)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
N	27,900	14,867	13,863	7,971	8,114	7,971
R-squared	0.453	0.439	0.437	0.440	0.411	0.408

[a] The dependent variable is Ln(hourly wage); [b] For each variable it is shown on the 1st line the coefficient, 2nd line in paranthesis the SE, and on the 3rd line in brackets the p-value; [c]All models contain CEM weights except Model 1

Table 5. Consistency check analyses for the main effect [a b c]

	Model 7	**Model 8a**	**Model 8b**	**Model 8c**	**Model 8d**	**Model 8e**	**Model 8f**	**Model 9**
	Post-2008 sample	CEM matched t-3	CEM matched t-2	CEM matched t-1	CEM matched t+1	CEM matched t+2	CEM matched t+3	Additional lb. market controls
Offshoring(d)	0.057	-0.015	-0.004	0.014	0.053	0.069	0.086	0.068
	[0.000]	[0.316]	[0.784]	[0.428]	[0.006]	[0.000]	[0.000]	[0.000]
No. unemployed (industry & year)								0.000
								[0.742]
Share unemployed (by municipality & year)								-2.617
								[0.002]
With controls [d]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	4.892	4.719	4.798	4.903	4.989	4.437	4.720	4.708
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
N	6,921	3,810	3,482	2,899	2,809	3,157	3,663	7,971
R-squared	0.449	0.440	0.435	0.467	0.450	0.409	0.398	0.408

[a] The dependent variable is Ln(hourly wage); [b]All models include CEM weights with conditioning variables as in Model 6, Table 4; [c]For each variable it is shown on the 1st line the coefficient, and on the 2nd line in brackets the p-value; [d] Individual level control variables: College educated(d), Female (d), TMT member (d), Work experience (Years), Work experience^2, Prev. inc. decile dummies, 2-digits occupation codes, Hiring year dummies. Firm level control variables: Prior firm avg. wages, Workplace size, Productivity, Firm age (years), Exporter(d), Domestic(d), Cost leadership(d, Profitable (d), Region dummies, Sector dummies.