

Understanding work behaviors in remote work environments during the COVID-19 pandemic: Transaction cost theory perspective

Xi Chen^{1,*}

Wei-Hsi Hung²

*Corresponding author

¹ Doctoral Student, Department of Management Information Systems, National Chengchi University, Republic of China (Taiwan), xiic0403@gmail.com

² Professor, Department of Management Information Systems, National Chengchi University, Republic of China (Taiwan), fhung@nccu.edu.tw

ABSTRACT

Previous studies on remote work have not fully understood which roles are suitable for remote work. In our study, we performed the literature review method and developed a conceptual model inspired by transaction cost theory. Additionally, we believe remote work is an optional option in the context of hybrid work during COVID-19. Our conceptual model leads us to believe that remote workers incur some additional perceived costs in the remote work process. We analyze the following four different roles to understand their perceived costs of working remotely: CEO, product manager, database engineer, and administrative employee. We are expected to provide theoretical explanations for what factors influence remote workers' perceived transaction costs.

Keywords: Transaction cost theory, remote work.

INTRODUCTION

Since spring 2020, the COVID-19 pandemic has been forcing people to rethink life. The workers must use remote computer access at home to prevent the spread of the virus explosions, which is called remote work. Remote work refers to a type of work pattern that integrates ICT into work processes to move location away from the physical office (Baruch, 2001, p. 113). Remote work has recently evolved into a hybrid workplace that allows workers the flexibility to choose work location between the physical office and home, referred to as hybrid work. According to a recent SurveyMonkey and Zoom survey (2021), nearly 65% of respondents out of 1500 remote workers in the US say hybrid work is their preferred work style. Particularly, a burning issue is that not every worker is suited to hybrid work, as techwireasia reports. This practical question thus offers an interesting basis for scientific discussion.

Because of the dual nature of hybrid work, we can discern the worker's place of work: the physical environment and the remote environment. In our study, we focus on the analysis of remote work. Two major areas in previous studies on remote work have been organizational control (Brice et al., 2011; Errichiello & Pianese, 2016; Groen et al., 2018) and technology acceptance (Daniels et al., 2001; Ndubisi & Kahraman, 2005; Mayo et al., 2009; Neirotti et al., 2013; Ansong & Boateng, 2018). However, little is known about the hidden costs (such as search costs, enforcement costs, bargaining costs, and examination costs) that workers suffer while working remotely. Hence, we completed the literature reviews to identify the research gap and propose a conceptual model based on transaction cost theory and show available evidences for the proposed propositions. We selected four different roles (CEO, product manager, database engineer and administrative employee) in the organization that have their key responsibilities. We develop some propositions to answer these following questions: (1) What factors are associated with the perceived transaction costs of doing business remotely? and (2) How does each factor affect perceived transaction costs? The results of this study will help determine the applicability of remote workers.

Given the lack of scholarly research on this urgent but intriguing topic, we believe there is an urgent need to apply the new model to support the differential impact of employee role attributes on remote workers' costs. This study would not only help to understand hybrid work (i.e. remote work and physical office work), but also offer entrepreneurs practical human resources management. The rest of this paper is organized as follows. First, we introduce remote work and the concept of transaction cost theory. We will then review some arguments and present some research proposition for the model. Next, we will present the expected contribution, including theoretical and practical implications of our results. Finally, we acknowledge the limitations of the study.

LITERATURE REVIEW

The Nature of Remote Work

Remote work is often associated with organizational behavior (Ndubisi & Kahraman, 2005; Carillo et al., 2020) (Table 1). Remote work involves relative uncertainty in communication and performance (Brice et al., 2011). These issues are technical and environmental in nature, affecting the intention of corporate stakeholders to adopt remote information systems (Ansong & Boateng, 2018). A perfect consideration of the arrangement of remote work should first understand the antecedents of the

adoption of remote work and establish the relationship between organizational control and outcomes (Errichiello & Pianese, 2016). Meanwhile, the onset of remote work adoption (e.g., the early adopters and the late adopters) would shape the structure of the organization (Daniels et al., 2001).

A common observation related to remote work is that there is considerable debate among academics about the behavior of remote workers. Remote workers increase in-person work efficiency as some associated transportation costs (e.g., fuel oil costs and travel expenses) are reduced (Ansong & Boateng, 2018). Likewise, remote workers receive less monitoring and improve their job performance (Groen et al., 2018). On the other hand, some researchers have argued that remote workers experience long hours and surveillance at work (Xiao et al., 2021; DeFilippis et al., 2020; Bolisani et al., 2020). However, the efficiency and performance of remote workers is highly dependent on their IT skills (Staples et al., 1998; Silva-C et al., 2019). Furthermore, the descriptive characteristics of remote workers (e.g., work experiences and task types) are often also used to assess individual remote work outcomes (e.g., satisfaction, ability, and performance) (Turetken et al., 2010; Nakrošienė et al., 2019). Job characteristics can also cause a difference in remote worker acceptance (Mayo et al., 2009).

Table 1: The overview of remote work behavior

Sources	Aspects hierarchy	Adoption theories	Focuses
Staples et al. (1998)	Individual	Self-Efficacy theory	Performance
Daniels et al. (2001)	Organization	Neo-institutional theory	Adoption
Ndubisi & Kahraman (2005)	Organization	Resource based view/ Agency theory/ Institutional theory/ Societal marketing concept	Remote work adoption
Mayo et al. (2009)	Organization	Contingency theory	Remote work adoption
Turetken et al. (2010)	Individual	Distributed work arrangements (Collins, 1998)	Remote work success
Brice et al. (2011)	Organization	Transaction cost theory/Agency theory	Output and behavioral controls.
Neirotti et al. (2013)	Individual	Technology-organization-environment framework (TOE)	Remote work adoption
Errichiello & Pianese (2016)	Individual, groups, and Organization	Structuration theory	Organizational control
Groen et al. (2018)	Individual	Control theory	Output controls
Ansong & Boateng (2018)	Organization	Technology-organization-environment framework (TOE)	Remote work Adoption
Nakrošienė et al. (2019)	Individual	Job demands-resources theory (JD-R)	Remote work outcomes (e.g., productivity)
Silva-C et al. (2019)	Individual	Technology acceptance model	Remote work attitude
Carillo et al. (2020)	Individual	The theory of work adjustment (TWA)	Remote work adjustment
<u>Our Study</u>	<u>Individual</u>	<u>Transaction cost theory</u>	<u>The willingness of doing remote work</u>

Source: This study.

The Applicability of Transaction Cost Theory to Remote Work

The transaction cost theory was first articulated by Coase (1937), who points out that transaction costs stem from the additional costs in addition to the price mechanism in the market economy. These cost elements can be categorized into ex-ante (e.g., search costs) and ex-post costs (e.g., monitoring costs). Later, Williamson (1985) expanded the original concept to add the dynamic effect. To put it another way, environmental uncertainty, complexity, low transaction frequency, information asymmetry, and poor transaction atmosphere all contribute to failure.

The transaction cost theory has been successfully applied in many aspects. Established examples include applications of transaction cost theory in the areas of corporate governance (Kochhar, 1996; Teece, 1986; Saravia & Saravia-Matus, 2014; McClelland & O'Brien, 2014), online shopping (Wu et al., 2014; Teo, 2006; Si, 2021; Che et al., 2015; Liang & Huang, 1998), and supply chains (Grover & Malhotra, 2003; Ketokivi & Mahoney, 2020; Ma et al., 2022; de Goeij et al., 2021). Transaction cost theory is often used to evaluate decisions affecting a range of channel or product integration options. Klein (1989) examined companies' channel integration decisions in foreign marketplaces. Liang et al (2021) discussed the valuation of products sold online. Since remote work is an alternative compared to the physical office, it is reasonable to assume that workers would prefer the style of work with lower perceived transaction costs. While workers are drawn to the convenience of remote work, they also perceive various uncertainties through the remote work process that increase their transaction costs. For example, they might be concerned about IT disruptions or message misunderstandings. Using this example, this makes the

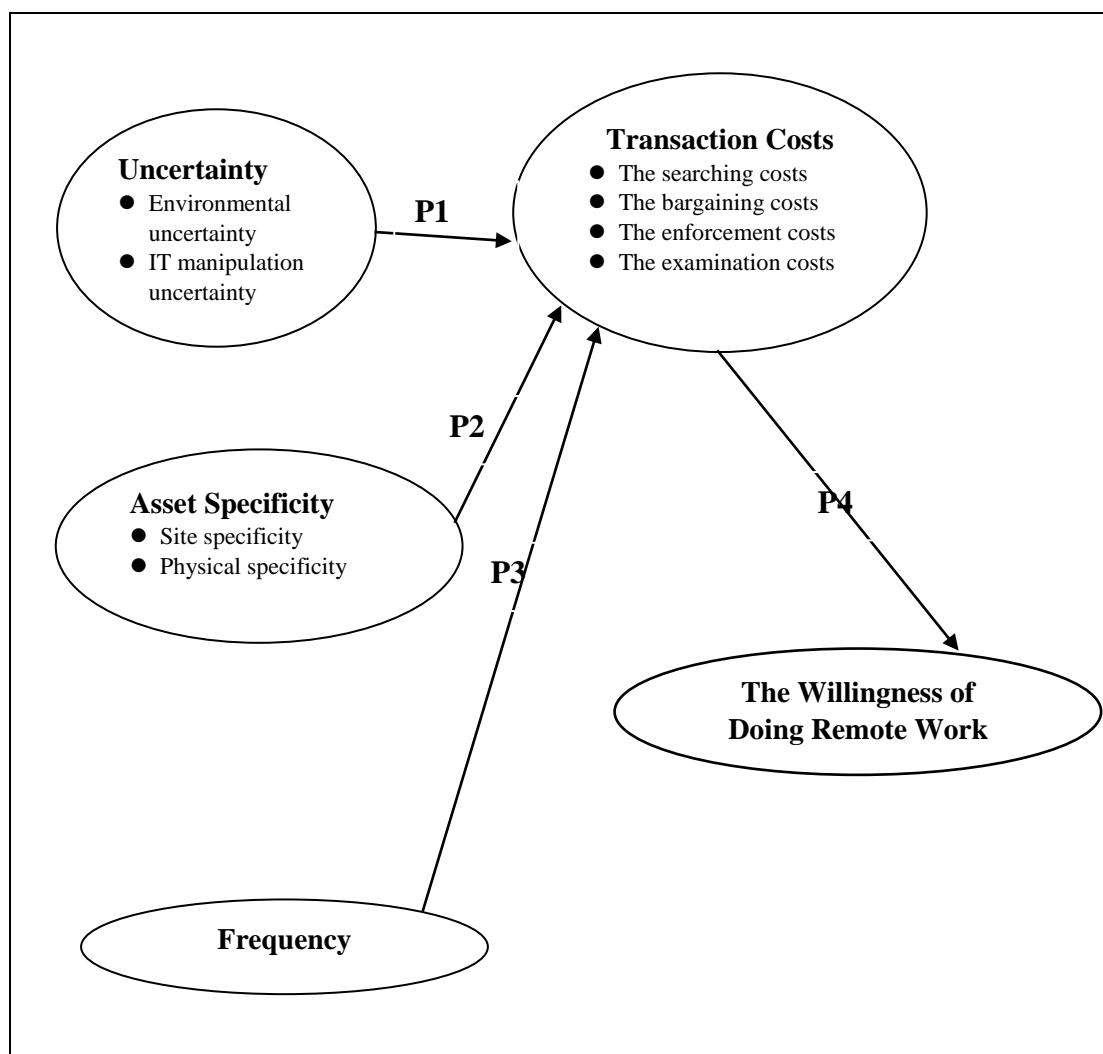
transaction cost theory being reasonable interpretation of remote work behavior. As a result, we highlight whether the worker would choose to work remotely, which is determined by workers' perceived transaction costs.

RESEARCH METHOD

We reviewed the literature on the theoretical perspective of remote work to attempt a solution to the practical issue of which role is a good case for conducting remote work. Nevertheless, most studies emphasize how the relationship between the remote system and the remote workers affects organizational development. Therefore, we determine the appropriate use of the transaction cost theory in the context of this research question. Finally, we propose a research model with the structural equation modeling.

THE PROPOSED MODEL

We performed a novel model using transaction cost theory after analyzing the theory's feasibility from the literature reviews (Figure 1). In our study we analyze four roles, for example the CEO, product manager, database engineer, and administrative employee. The next step is to provide some evidence to support the proposed propositions.



Source: This study.

Figure 1: Research model

Proposition I: More uncertainty leads to a higher transaction cost (P1).

Uncertainty arises from unpredictable and unverifiable events (Geyskens et al., 2006; Gulati & Singh, 1998) related to the costs associated with the asymmetric information (Liang et al., 2021; Cuypers et al., 2021). From the remote worker perspective, we argue if CEO, product manager, database engineer and administrative employee choose the way of working remotely and then they would create the challenge of environmental uncertainty and IT manipulation uncertainty. Environmental uncertainty basically refers to the unforeseen changes in the circumstances of the exchange (Noordewier et al., 1990). These workers transfer information via ICT to achieve the work goals, which can be considered as an environment for information exchange. Compared to the physical office, the collaborative interaction between the remote workers remains more static and isolated (Yang et al., 2022). Such uncertainty causes a craving for flexibility (Klein, 1989). Consequently, the remote workers receive the less dynamic message changes in the remote environment. Another suggested uncertainty is the

manipulation of uncertainty by IT. The uncertainty of IT manipulation relates to the frequency of updates and the unpredictability of the ICT software that causes the perceived uncertainty for the remote workers. In most cases, one such uncertainty in IT manipulation is the fuzzy relationship between technical requirements and precise expectations (Walker & Weber, 1984; Anderson et al., 2016). If the remote system's software is updated rapidly, the computer system may lead to bugs. In this situation, the remote workers would spend so much time adopting the new change of the software. Then it is inevitable to encounter the consequences of workers' performance degradation and users' preference, which is certainly associated with willingness. In addition, the uncertainty is associated with the contextual environment (Williamson, 1975). We believe the remote workers would have the dual perceived behaviors that would create a sense of insecurity.

Proposition II: More asset specificity leads to a higher transaction cost (P2).

Asset specificity refers to the enduring investments made to support specific transactions (Williamson, 1985, p. 55). Asset specificity is at the core of transaction cost theory (Williamson, 1981; Whyte, 1994; Lamminmaki, 2005), which is used when jointly considered product complexity and uncertainty (Shelanski & Klein, 1995). In our study we draw inspiration from Williamson (1983) and distinguish two types of asset specificity: (1) site specificity and (2) physical specificity.

Site specificity refers to superior site implying resource acquisition but associated relocation costs (Williamson, 1983). Turyahikayo et al. (2018) implies that asset specificity increases demand coordination. Therefore, we argue that some jobs that require human interaction and cross-team collaboration have higher site specificity.

Physical specificity refers to the use of specialized tooling required for component manufacture (Williamson, 1983). Under this definition, this can be construed as the necessities during the production process. Therefore, we believe that some maintenance jobs would have higher physical specificity due to the centralized computer system in the physical office. In theory, as asset specificity increases, the trader strives to control opportunistic behavior, which incurs more transaction costs (Williamson, 1985).

Proposition III: More frequency leads to a lower transaction cost (P3).

Frequency represents the number of repeat purchases in the transaction (Loebbecke & Huyskens, 2006; Aubert et al., 1996). Therefore, we define frequency as the times when technology tools are used to perform remote work. For hybrid work, frequency also impacts workers' perceived transaction costs and their willingness to work remotely. For dealing with technological tools and virtual workshop platforms, the reaction to the level of uncertainty in the transaction process is differentiated for those familiar and unfamiliar with using technological tools and virtual workshop platforms. The more frequent the transaction process occurs, the more transaction costs are mitigated (Miranda et al., 2006). The appropriate frequency brings the benefits of efficient use of the resources involved (Walker & Weber, 1984), which can reduce search costs for remote workers.

Proposition IV: More transaction cost leads to a lower worker's willingness of doing remote work (P4).

In remote work, the different workers at the different positions can access a wide variety of services and start their work business via a virtual environment. Further, the different attributes of job responsibility reflect transaction costs in various ways. The remote workers face more discontinuities due to the complexity of the environment (Watson-Manheim et al., 2002), which may lead these individuals to search for enough information to avoid the scatter problem (such as information asymmetry). The perceived discontinuities result from the differences between job expectations and reality (Watson-Manheim et al., 2012). We believe that work administration would exacerbate the discontinuities for their employees in the virtual environment and that remote workers need to meet their needs by seeking appropriate aids. In addition, the level of bargain is based on the level of the social norm (Misyak et al., 2014). The higher social norm gives clear normative trends and then the remote workers set the threshold to consultant with the coworker. The nature of the bargain cost can be viewed as the quality of communication efficiency (Langer, 2017; Berry, 2011). When the remote workers thus need to conclude suggestions from members and present the list to the superiors, then increase the bargain cost. The virtual work experiences are a facilitation to acclimatize remote workers to the new working conditions (Gajendran & Harrison, 2007; Raghuram et al., 2001), which affects the enforcement period. Such adaptation arises from the gap between the remote work environment and reality. We believe that if the employee's role typically relies on computer systems for their work, the role of employees would receive fewer enforcement costs. Even though remote work is often viewed as a resource for adapting to the new workplace, it can lack accuracy in gathering information (Al-Habaibeh et al., 2021). We think that the job of remote employees involves human resources and human interaction, which increases the examination cost in a virtual environment for themselves. In our study, four types of transaction costs are involved in the worker's willingness of doing remote work. These transaction costs include:

- 1) The searching costs: The worker spends time and effort searching for information among various search engines or social media making the task easier.
 - 2) The bargaining costs: The worker spends time and effort online coming to a consensus regarding the details of the work task.
 - 3) The enforcement costs: The worker spends time and effort online ensuring the goal of the completed work task because of unpredictable occurrences.
 - 4) The examination costs: The worker spends time and effort online performing the acceptance test on all tasks.
- Based on these observations, the worker would choose transaction forms that cut down the perceived transaction costs.

CONCLUSION

The aim of this study is to propose an innovative conceptual model by resorting to transaction cost theory. In this study, we try to show the applicability of transaction cost theory to hybrid work through literature reviews. Overall, we examine the emerging role of hybrid work in the context of COVID-19. In our research model, we analyze the four different types of positions (CEO, product manager, database engineer, and administrative employee). We expect the empirical results to be as follows: CEOs and database engineers would be more likely to work remotely than product managers and administrative employees. This is mainly due to the variance of the individually perceived transaction costs. This expected result was in part similar to Brynjolfsson et al. (2020), in which a large number of employees in managerial and professional roles are moving to the home office. Both roles can avoid spending unnecessary time on conversations. The list and number of personal task arrangements vary across space (i.e., physical and virtual space) (Felstead et al., 2003), which can impact cost generation. Compared to working in the physical office, remote workers (CEOs and database engineers) increase search costs and negotiation costs, but instead decreases audit costs and enforcement costs. The CEO specializes in shaping the organization's decision-making process and the database engineer specializes in keeping the data secure. The characteristic of their work is not limited to space and time, which suggests that CEO and database engineer can focus on solving problems through remote work. Nowadays almost all CEOs take mobile phones to do all business. We believe the CEO makes better decisions without going to the office to make decisions. The use of computers is also a database engineer's forte. We believe that database engineers retain their professional skills in virtual workplaces, which increases a rich focus on computer system maintenance. However, for the database engineer working in the company that equips the core computer system in the physical office, the physical asset specificity could increase to get the specific resources in a reality office. In contrast, professional responsibility requires the process of a series of negotiations (the product manager), and countless different office tasks (the administrative employee) are less suitable for remote work since these jobs rely on human interaction to increase work efficiency. The physical office has the absolute advantage that team members can easily interact with each other face to face. In Addition, face-to-face engagement is particularly important in establishing early levels of trust and familiarity with remote work (Bailey & Kurland, 1999). We believe product managers easily link the sense of trust when working in the physical work environment. Additionally, administrative employee can reduce search costs by working in the physical office. Hill et al. (2003) found that remote workers often face the problem of a lack of face-to-face meetings with their managers, leading to stagnation. We believe that administrative employee in remote environments experiences the challenge of a more comfortable relationship with their manager and can ask back and forth for more confirming the needs at work, which is related to the examination cost. Meanwhile, the ease of ICT influences the assessment for remote workers (Wheelan et al., 2016), which administrative employee should pay attention to the usability of technology in virtual environments. Thus, we conclude that the higher an individual's perceived transaction costs, the less likely they are to work remotely.

As with any academic research, we provide the limitations of this study and suggestions for future research. First, the proposed propositions can only provide the preliminary statements to confirm the practical observations, and empirical examination is required to establish theoretical structures. Second, the underlying costs of remote workers need to be further evaluated in future study. In our study, hybrid work is an alternative between physical office work and remote work. Future research needs to examine the actual transaction cost factors that may come close to the dynamic change in remote workers. Third, we do not know enough about the cost events in these remote workers and how they happened, the scholars may need further interviews to gain meaningful insights. Fourth, given the differences in corporate cultures around the world, the results may not meaningfully extrapolate to other remote workers. Fifth, because of the differences between the characteristics of remote workers, further empirical investigation is needed regarding the generalizability of the cost of personality to individual remote worker's willingness.

REFERENCES

- Ansong, E., & Boateng, R. (2018). Organisational adoption of telecommuting: Evidence from a developing country. *The Electronic Journal of Information Systems in Developing Countries*, 84(1), e12008. <https://doi.org/10.1002/isd2.12008>
- Aubert, B. A., Rivard, S., & Patry, M. (1996). A transaction cost approach to outsourcing behavior: Some empirical evidence. *Information & management*, 30(2), 51-64. [https://doi.org/10.1016/0378-7206\(95\)00045-3](https://doi.org/10.1016/0378-7206(95)00045-3)
- Al-Habaibeh, A., Watkins, M., Waried, K., & Javareshk, M. B. (2021). Challenges and opportunities of remotely working from home during Covid-19 pandemic. *Global Transitions*, 3, 99-108. <https://doi.org/10.1016/j.glt.2021.11.001>
- Anderson, K. G., Deschênes, S. S., & Dugas, M. J. (2016). Experimental manipulation of avoidable feelings of uncertainty: Effects on anger and anxiety. *Journal of Anxiety Disorders*, 41, 50-58. <https://doi.org/10.1016/j.janxdis.2016.03.007>
- Baruch, Y. (2001). The status of research on teleworking and an agenda for future research. *International journal of management reviews*, 3(2), 113-129. <https://doi.org/10.1111/1468-2370.00058>
- Brice Jr, J., Nelson, M., & Gunby Jr, N. W. (2011). The governance of telecommuters: An agency and transaction cost analysis. *Academy of Strategic Management Journal*, 10(1), 1-17. https://www.researchgate.net/profile/Jeff-Brice/publication/286156477_The_governance_of_telecommuters_An_agency_and_transaction_cost_analysis/links/55523e2808ae6943a86d7044/The-governance-of-telecommuters-An-agency-and-transaction-cost-analysis.pdf
- Bailey, N., & Kurland, N. B. (1999). The advantages and challenges of working here, there, anywhere, and anytime. *Organizational dynamics*, 28(2), 53-68. [https://doi.org/10.1016/S0090-2616\(00\)80016-9](https://doi.org/10.1016/S0090-2616(00)80016-9)
- Berry, G. R. (2011). Enhancing effectiveness on virtual teams: Understanding why traditional team skills are insufficient. *The Journal of Business Communication* (1973), 48(2), 186-206. <https://doi.org/10.1177/0021943610397270>

- Bolisani, E., Scarso, E., Ipsen, C., Kirchner, K., & Hansen, J. P. (2020). Working from home during COVID-19 pandemic: Lessons learned and issues. *Management & Marketing. Challenges for the Knowledge Society*, 15(1), 458-476. <https://doi.org/10.2478/mmcks-2020-0027>
- Brynjolfsson, E., Horton, J. J., Ozimek, A., Rock, D., Sharma, G., & TuYe, H.-Y. (2020). COVID-19 and remote work: An early look at US data. 10.3386/w27344
- Che, T., Peng, Z., Lim, K. H., & Hua, Z. (2015). Antecedents of consumers' intention to revisit an online group-buying website: A transaction cost perspective. *Information & Management*, 52(5), 588-598. <https://doi.org/10.1016/j.im.2015.04.004>
- Carillo, K., Cachat-Rosset, G., Marsan, J., Saba, T., & Klarsfeld, A. (2021). Adjusting to epidemic-induced telework: Empirical insights from remote workers in France. *European Journal of Information Systems*, 30(1), 69-88. <https://doi.org/10.1080/0960085X.2020.1829512>
- Cuypers, I. R., Hennart, J.-F., Silverman, B. S., & Ertug, G. (2021). Transaction cost theory: Past progress, current challenges, and suggestions for the future. *Academy of Management Annals*, 15(1), 111-150. 10.5465/annals.2019.0051
- Coase, R. H. (1937). The nature of the firm. *economica*, 4(16), 386-405. <https://doi.org/10.1111/j.1468-0335.1937.tb00002.x>
- Daniels, K., Lamond, D., & Standen, P. (2001). Teleworking: frameworks for organizational research. *Journal of management studies*, 38(8), 1151-1185. <https://doi.org/10.1111/1467-6486.00276>
- de Goeij, C., Gelsomino, L. M., Caniato, F., Moretto, A. M., & Steeman, M. (2021). Understanding SME suppliers' response to supply chain finance: a transaction cost economics perspective. *International Journal of Physical Distribution & Logistics Management*. 10.1108/IJPDLM-04-2020-0125
- DeFilippis, E., Impink, S. M., Singell, M., Polzer, J. T., & Sadun, R. (2020). Collaborating during coronavirus: The impact of COVID-19 on the nature of work. <http://dx.doi.org/10.2139/ssrn.3654470>
- Errichiello, L., & Pianese, T. (2016). Organizational control in the context of remote work arrangements: a conceptual framework *Performance measurement and management control: Contemporary issues*: Emerald Group Publishing Limited. <https://doi.org/10.1108/S1479-351220160000031009>
- Felstead, A., Jewson, N., & Walters, S. (2003). Managerial control of employees working at home. *British journal of industrial relations*, 41(2), 241-264. <https://doi.org/10.1111/1467-8543.00271>
- Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: meta-analysis of psychological mediators and individual consequences. *Journal of applied psychology*, 92(6), 1524. <https://doi.org/10.1037/0021-9010.92.6.1524>
- Gulati, R., & Singh, H. (1998). The architecture of cooperation: Managing coordination costs and appropriation concerns in strategic alliances. *Administrative science quarterly*, 781-814. <https://doi.org/10.2307/2393616>
- Geyskens, I., Steenkamp, J.-B. E., & Kumar, N. (2006). Make, buy, or ally: A transaction cost theory meta-analysis. *Academy of management journal*, 49(3), 519-543. <https://doi.org/10.5465/amj.2006.21794670>
- Groen, B. A., Van Triest, S. P., Coers, M., & Wtenwerde, N. (2018). Managing flexible work arrangements: Teleworking and output controls. *European Management Journal*, 36(6), 727-735. <https://doi.org/10.1016/j.emj.2018.01.007>
- Grover, V., & Malhotra, M. K. (2003). Transaction cost framework in operations and supply chain management research: theory and measurement. *Journal of Operations management*, 21(4), 457-473. [https://doi.org/10.1016/S0272-6963\(03\)00040-8](https://doi.org/10.1016/S0272-6963(03)00040-8)
- Hill, E. J., Ferris, M., & Mårtinson, V. (2003). Does it matter where you work? A comparison of how three work venues (traditional office, virtual office, and home office) influence aspects of work and personal/family life. *Journal of vocational behavior*, 63(2), 220-241. [https://doi.org/10.1016/S0001-8791\(03\)00042-3](https://doi.org/10.1016/S0001-8791(03)00042-3)
- Ketokivi, M., & Mahoney, J. T. (2020). Transaction cost economics as a theory of supply chain efficiency. *Production and Operations Management*, 29(4), 1011-1031. <https://doi.org/10.1111/poms.13148>
- Kochhar, R. (1996). Explaining firm capital structure: The role of agency theory vs. transaction cost economics. *Strategic Management Journal*, 17(9), 713-728. [https://doi.org/10.1002/\(SICI\)1097-0266\(199611\)17:9<713::AID-SMJ844>3.0.CO;2-9](https://doi.org/10.1002/(SICI)1097-0266(199611)17:9<713::AID-SMJ844>3.0.CO;2-9)
- Klein, S. (1989). A transaction cost explanation of vertical control in international markets. *Journal of the Academy of Marketing Science*, 17(3), 253-260. <https://doi.org/10.1007/BF02729817>
- Lamminmaki, D. (2005). Why do hotels outsource? An investigation using asset specificity. *International journal of contemporary hospitality management*. 10.1108/09596110510612158
- Langer, A. M. (2017). *Information technology and organizational learning: Managing behavioral change in the digital age*. CRC Press. <https://doi.org/10.1201/9781315143804>
- Liang, T.-P., Lin, Y.-L., & Hou, H.-C. (2021). What drives consumers to adopt a sharing platform: An integrated model of value-based and transaction cost theories. *Information & Management*, 58(4), 1-13. <https://doi.org/10.1016/j.im.2021.103471>
- Liang, T.-P., & Huang, J.-S. (1998). An empirical study on consumer acceptance of products in electronic markets: a transaction cost model. *Decision support systems*, 24(1), 29-43. 10.1016/S0167-9236(98)00061-X
- Loebbecke, C., & Huyskens, C. (2006). What drives netsourcing decisions? An empirical analysis. *European Journal of Information Systems*, 15(4), 415-423. <https://doi.org/10.1057/palgrave.ejis.3000621>
- Mayo, M., Pastor, J. C., Gomez-Mejia, L., & Cruz, C. (2009). Why some firms adopt telecommuting while others do not: A contingency perspective. *Human Resource Management*, 48(6), 917-939. <https://doi.org/10.1002/hrm.20322>
- Miranda, S. M., & Kim, Y.-M. (2006). Professional versus political contexts: institutional mitigation and the transaction cost heuristic in information systems outsourcing. *Mis Quarterly*, 725-753. <https://doi.org/10.2307/25148747>

- Montgomery, J. (2021). "New Survey: What People Really Think about Hybrid Work." Retrieved April 25, 2022, from <https://blog.zoom.us/new-survey-what-people-really-think-about-hybrid-work/>
- Ma, D., Chen, Y., Fu, Y., & Meng, C. (2022). Influencing factors of outsourcing in construction projects: a holistic perspective. *International Journal of Managing Projects in Business*, 10.1108/ijmpb-04-2021-0107
- McClelland, P. L., & O'Brien, J. P. (2011). Transaction cost economics and corporate governance: The case of CEO age and financial stake. *Managerial and Decision Economics*, 32(3), 141-158. <https://www.jstor.org/stable/23012434>
- Misyak, J. B., Melkonyan, T., Zeitoun, H., & Chater, N. (2014). Unwritten rules: virtual bargaining underpins social interaction, culture, and society. *Trends in cognitive sciences*, 18(10), 512-519. <https://doi.org/10.1016/j.tics.2014.05.010>
- Nakrošienė, A., Bučiūnienė, I., & Goštautaitė, B. (2019). Working from home: characteristics and outcomes of telework. *International Journal of Manpower*. <https://doi.org/10.1108/IJM-07-2017-0172>
- Ndubisi, N. O., & Kahraman, C. (2005). Teleworking adoption decision-making processes: Multinational and Malaysian firms comparison. *Journal of Enterprise Information Management*. <https://doi.org/10.1108/17410390510579891>
- Noordewier, T. G., John, G., & Nevin, J. R. (1990). Performance outcomes of purchasing arrangements in industrial buyer-vendor relationships. *Journal of marketing*, 54(4), 80-93. <https://doi.org/10.2307/1251761>
- Neirotti, P., Paolucci, E., & Raguseo, E. (2013). Mapping the antecedents of telework diffusion: firm-level evidence from Italy. *New Technology, Work and Employment*, 28(1), 16-36. <https://doi.org/10.1111/ntwe.12001>
- Raj, A. (2022). "Can a hybrid work model solve the skills shortage problem?" Retrieved April 25, 2022, from <https://techwireasia.com/2022/04/organizations-southeast-asia-hybrid-work-model/>
- Raghuram, S., Garud, R., Wiesenfeld, B., & Gupta, V. (2001). Factors contributing to virtual work adjustment. *Journal of management*, 27(3), 383-405. 10.1016/S0149-2063(01)00097-6
- Saravia, J., & Saravia-Matus, S. (2014). Corporate governance and transaction cost economics: A study of the equity governance structure. Center for Research in Economics and Finance (CIEF), Working Papers(14-11). <http://dx.doi.org/10.2139/ssrn.2444302>
- Shelanski, H. A., & Klein, P. G. (1995). Empirical research in transaction cost economics: a review and assessment. *Journal of Law, Economics, & Organization*, 335-361. <https://www.jstor.org/stable/765001>
- Si, Y. (2021). Research on the balanced relationship between online consumer behavior and E-commerce service quality based on 5G network. *Mobile Information Systems*, 2021. <https://doi.org/10.1155/2021/5562996>
- Silva-C, A., Montoya R. I. A., & Valencia, A. J. A. (2019). The attitude of managers toward telework, why is it so difficult to adopt it in organizations? *Technology in Society*, 59, 101133. <https://doi.org/10.1016/j.techsoc.2019.04.009>
- Staples, D. S., Hulland, J. S., & Higgins, C. A. (1998). A self-efficacy theory explanation for the management of remote workers in virtual organizations. *Journal of computer-mediated communication*, 3(4), JCMC342. <https://www.emerald.com/insight/content/doi/10.1108/IJM-07-2017-0172/full/html>
- Teece, D. J. (1986). Transactions cost economics and the multinational enterprise An Assessment. *Journal of Economic Behavior & Organization*, 7(1), 21-45. [https://doi.org/10.1016/0167-2681\(86\)90020-X](https://doi.org/10.1016/0167-2681(86)90020-X)
- Teo, T. S. (2006). To buy or not to buy online: adopters and non-adopters of online shopping in Singapore. *Behaviour & Information Technology*, 25(6), 497-509. <https://doi.org/10.1080/01449290500256155>
- Turetken, O., Jain, A., Quesenberry, B., & Ngwenyama, O. (2010). An empirical investigation of the impact of individual and work characteristics on telecommuting success. *IEEE Transactions on Professional Communication*, 54(1), 56-67. <https://doi.org/10.1109/TPC.2010.2041387>
- Turyahikayo, W., Matsiko, F., Okiror, J., Obaa, B., & Hanf, J. (2018). The perceived role of innovation platforms in addressing the agricultural value chain collective problems: an empirical application of transaction cost theory. *International Journal of Agricultural Research, Innovation and Technology (IJARIT)*, 8(2355-2020-1649), 1-12. 10.3329/ijarit.v8i2.40550
- Williamson, O. E. (1975). Markets and hierarchies: analysis and antitrust implications: a study in the economics of internal organization. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.
- Williamson, O. E. (1981). The economics of organization: The transaction cost approach. *American journal of sociology*, 87(3), 548-577. <https://www.journals.uchicago.edu/doi/10.1086/227496>
- Williamson, O. E. (1983). Credible commitments: Using hostages to support exchange. *The American economic review*, 73(4), 519-540. https://econpapers.repec.org/article/aeaecrev/v_3a73_3ay_3a1983_3ai_3a4_3ap_3a519-40.htm
- Williamson, O. E. (1985). *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.
- Wu, L.-Y., Chen, K.-Y., Chen, P.-Y., & Cheng, S.-L. (2014). Perceived value, transaction cost, and repurchase-intention in online shopping: A relational exchange perspective. *Journal of business research*, 67(1), 2768-2776. <https://www.sciencedirect.com/science/article/pii/S0148296312002433>
- Walker, G., & Weber, D. (1984). A transaction cost approach to make-or-buy decisions. *Administrative science quarterly*, 373-391. <https://doi.org/10.2307/2393030>
- Watson-Manheim, M. B., Chudoba, K. M., & Crowston, K. (2002). Discontinuities and continuities: A new way to understand virtual work. *Information technology & people*. <https://doi.org/10.1108/09593840210444746>
- Watson-Manheim, M. B., Chudoba, K. M., & Crowston, K. (2012). Perceived discontinuities and constructed continuities in virtual work. *Information systems journal*, 22(1), 29-52. <https://doi.org/10.1111/j.1365-2575.2011.00371.x>

- Wheelan, S., Poole, M., & Zhang, H. (2016). Making knowledge work in virtual teams. *The Handbook of Group Research and Practice*; SAGE Publications: Thousand Oaks, CA, USA, 50, 363-384.
- Whyte, G. (1994). The role of asset specificity in the vertical integration decision. *Journal of economic behavior & organization*, 23(3), 287-302. [https://doi.org/10.1016/0167-2681\(94\)90003-5](https://doi.org/10.1016/0167-2681(94)90003-5)
- Xiao, Y., Becerik-Gerber, B., Lucas, G., & Roll, S. C. (2021). Impacts of working from home during COVID-19 pandemic on physical and mental well-being of office workstation users. *Journal of Occupational and Environmental Medicine*, 63(3), 181. [10.1097/JOM.0000000000002097](https://doi.org/10.1097/JOM.0000000000002097)
- Yang, L., Holtz, D., Jaffe, S., Suri, S., Sinha, S., Weston, J., et al. (2022). The effects of remote work on collaboration among information workers. *Nature human behaviour*, 6(1), 43-54. <https://doi.org/10.1038/s41562-021-01228-z>