Determinants and Consequences of Return to Office Policies*

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Abstract

We study the return to office (RTO) policies of publicly-traded firms by hand-collecting a dataset of policy announcements for the Russell 1000 firms. The amount of in-person work firms require varies significantly across industries and cities, and most firms allow some remote work. We then examine RTO policy choice in a model where firms trade off in-person productivity benefits with an in-person wage premium. Consistent with the model's predictions, we find that the feasibility of remote work and office rents determine RTO policy. We find no significant stock market reaction to announcements, which may indicate a lack of consensus on optimal RTO policies.

Key words: Remote work. Work-from-home. WFH. Return to office (RTO).
JEL codes: G14, M12, M54, R33.

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1 Introduction

The widespread adoption of Work-From-Home (WFH) technology during the COVID-19 pandemic has major consequences for the future of work. Many firms are struggling with how frequently to require their employees to come into the office, if at all, amid some employees demanding to be 100% remote and evidence that most employees prefer to do at least some remote work. Mas and Pallais (2017), He, Neumark, and Weng (2021), and Moens, Verhofstadt, Ootegem, and Baert (2022) all find evidence that employees require more compensation to work 100% in the office than they do to work at least part of the time from home, suggesting that firms can economize on their wage bill by offering employees the option of some WFH.

At the same time, at least some in-person work is likely positive for firm-wide productivity and the productivity of an individual employee. What firms are uncertain of is how to balance employee preferences for WFH against the productivity effects. While firms may be eager to see employees back in the office, they are also aware that an excessively stringent return-to-office (RTO) policy will harm employee retention or require paying higher wages. An RTO policy that requires too much in-person time may result in a productivity gain that is outweighed by the higher wage bill it requires. Conversely, if the productivity loss from a very accommodating RTO policy exceeds the reduction in wages, firms can increase their profits by mandating more days in the office.

In this paper, we study the RTO policies of Russell 1000 firms using a novel, hand-collected dataset on policies announced publicly from March 1, 2020, through June 1, 2023. We document several findings related to the distribution of RTO policies. First, roughly two-thirds of the Russell 1000 firms had announced an official RTO policy by June 1, 2023. Announcing firms tend to be larger than firms that do not announce official RTO policies, and announcers are concentrated in industries such as Information, Professional Services, and Retail Trade. In contrast, we find fewer announcements for firms in the Mining/Oil&Gas industry and Accommodation and Food Services industry.

Focusing on the firms that announce policies in our sample period, we then document a wide range of working arrangements that entail a mix of working in-person and remotely. A key contribution of our paper is the development of a classification system that assigns each firm to one of five possible RTO categories. These categories

vary in the degree to which the firm requires employees to work from the office or remotely. We manually assign firms to one of the five possible categories and find that most firms opt for a mix of in-person and remote work. This is consistent with the announcing firms rarely requiring employees to work from the office five days per week and fully-remote work being relatively rare. Fully in-person and fully remote policies each constitute less than 15% of announced policies. We show that there is significant variation in RTO policy choice across industries, consistent with certain industries having a higher share of occupations that can feasibly be done remotely. Additionally, there is variation across cities, consistent with urban form and real estate prices determining the relative cost of coming into the office.

After describing the distribution of RTO policies across the Russell 1000, we develop a model that captures the tradeoffs firms face in choosing their optimal policy. Following the theoretical literature on remote work, our model captures three key determinants of the firm's policy: the firm-specific productivity of remote work, the average commute time employees face, and the costs of both office space and residential housing. Our model predicts that firms will choose a greater share of in-person work when: (1) the productivity gain from in-person work relative to remote work is larger, (2) the average commute time is shorter, (3) office space is less costly to rent, or (4) residential housing costs more.

Next, we explore the determinants of policy type in a multivariate setting. Motivated by our model, we study a number of economic and firm-specific determinants, including industry characteristics, real estate prices, firm size and age, and CEO characteristics. We show that firms in industries in which remote work is ex-ante more feasible tend to choose policies that allow for more remote work. Additionally, the price of commercial office space is positively correlated with the level of remote work firms allow, and smaller firms tend to allow more remote work.

Finally, we analyze the stock market reaction to RTO policy announcements and do not find significant announcement returns. This may indicate that investors currently do not have a consensus on the optimal RTO policy.

Our paper contributes to three strands of the literature. The first is a growing body of work that examines the impact of remote work on productivity. A key finding that emerges in this literature is that the adverse impacts of too much remote work on productivity often occur in the future rather than immediately. For example, Bloom, Liang, Roberts, and Ying (2014) leverage call-processing employee data and

report that primarily remote workers were more productive after controlling for adverse selection into primarily remote work.[1] However, primarily remote workers were promoted at lower rates suggesting lower rates of human capital accumulation.[2] Consistent with a large amount of remote work reducing future productivity, Emanuel, Harrington, and Pallais (2023) find that software engineers receive more feedback on their code from colleagues who are physically proximate compared to those sitting further away, consistent with less human capital accumulation among workers doing a lot of remote work. Kruger, Maturana, and Nickerson (2023) find that finance researchers posted more working papers during the pandemic, presumably completing already conceived ideas, even as Barber, Jiang, Morse, Puri, Tookes, and Werner (2021) find a marked drop in the self-reported research productivity of academics during the COVID-19 pandemic. Our analysis of stock market prices, which incorporate expectations of future productivity, complements these studies by capturing the dynamic effects of RTO policies on productivity.

Importantly, existing literature suggests that the productivity loss associated with primarily remote work may be mitigated by hybrid work, because some tasks can more productively be done remotely, whereas other tasks are easier to do in person. Atkin, Chen, and Popov (2022) and Brucks and Levav (2022) study the effects of remote work on knowledge flows and idea generation respectively, and find an overall positive return to in-person interactions for both metrics of innovation. Bloom, Han, and Liang (2023) study engineers, finance, and marketing professionals and find no statistically significant difference in the productivity of hybrid work relative to fully in-person work. Davis, Ghent, and Gregory (forthcoming) find that off-site work is not a perfect substitute with on-site work indicating that primarily remote work is much less productive than hybrid work. Our concern in this paper is with workers wanting more remote work than the optimal level of productivity consistent with the model in Behrens, Kichko, and Thisse (2021) wherein too much remote work decreases output.

The contrasting findings in the existing literature underscore the possibility that the productivity of WFH might be highly industry and/or role-dependent. Our paper employs a novel hand-collected dataset that spans the entirety of corporate employees within the Russell 1000 companies. This comprehensive approach allows us to study

[1]We use the term "primarily" to allow for the possibility of arrangements wherein a worker would have to commute perhaps once a month or quarter. However, the reader can consider these workers 100% or "fully" remote for practical purposes.

[2]Emanuel and Harrington (2023) also find evidence of adverse selection into primarily remote work among call-processing employees but find that, after controlling for selection, primarily remote workers handle fewer calls than on-site workers indicating lower productivity.

WFH across a wide spectrum of industries and job types. By doing so, we provide a more generalized understanding of WFH productivity.

Our paper also relates to the labor economics literature studying the value employees place on non-monetary amenities, specifically, flexible working arrangements. Building on the insights provided by Mas and Pallais (2017), He, Neumark, and Weng (2021), Moens, Verhofstadt, Ootegem, and Baert (2022), and Colonnelli, McQuade, Ramos, Rauter, and Xiong (2023), who provide experimental evidence showing that employees demand higher compensation for in-person work, our paper broadens the scope of this analysis. We acknowledge the importance of this compensation tradeoff as a factor in developing RTO policies. However, our model moves beyond just the in-person work premium, and incorporates several factors that can influence the level of workplace flexibility offered by employers. These include commute times, the industry-specific feasibility of remote work, and the costs associated with residential and commercial real estate. Additionally, our model allows for a range of work arrangements that permit some remote work, rather than constraining the firm to a binary choice between fully in-person and fully remote.

Finally, our paper explores the intersection of firm behavior and urban economics. Our simple tradeoff model extends the discussion initiated by Gaspar and Glaeser (1998) on the digital transformation of urban spaces, and complements the theoretical frameworks provided by Delventhal and Parkhomenko (2023), Delventhal et al. (2022), and Davis et al. (forthcoming). Our findings demonstrate how factors such as the cost of commercial and residential real estate influence corporate policy regarding remote work and contributes to understanding how cities might evolve in response to widespread shifts toward more flexible work arrangements.[3]

In the next section we describe our hand-collected data on RTO policies and summarize the distribution of RTO policy types across industries, cities, and firm characteristics. Section 3 provides a conceptual framework underlining the factors that determine firms' choice of RTO policies. Based on this simple tradeoff model, we generate four testable predictions about how firms select the optimal policy. This is followed by Section 4, where we empirically test these predictions and summarize the role of different determinants in the RTO policy choice. Section 5 presents the

[3]A large literature studies the impact of teleworking on residential and commercial real estate prices and spatial sorting patterns. See, for example Gupta, Mittal, Peeters, and Van Nieuwerburgh (2022), Haslag and Weagley (forthcoming), Howard, Liebersohn, and Ozimek (2023), Li and Su (2023), and Van Nieuwerburgh (2023).

reaction of the stock market to RTO policy announcements, and Section 6 concludes.

2 RTO Policy Data

In this section, we describe how we gather our data on RTO policies and construct our main dataset. We also summarize the the distribution of RTO policy types across industries, cities, and firm characteristics.

2.1 Policy Data Collection

The firms in our sample consist of Russell 1000 constituents as of December 31, 2019, obtained via Bloomberg. Of the initial 1000 firms, 933 remain after dropping some due to lack of data on stock returns and accounting for dual class shares and mergers and acquisitions that occurred between 2019 and the beginning of our announcement collection period. We order these firms using a randomly generated serial number to avoid alphabetical bias in the data gathering process. We then collect announcement date information and details about the RTO policies using Factiva news sources. Factiva collects news and information on millions of firms using "newspapers, magazines, journals, websites, blogs, market research and multimedia formats from credible, reliable sources."[4] Therefore, the RTO announcements come from a variety of sources, including traditional print media, earnings call transcripts, regulatory filings (10-Ks, 10-Qs, etc.), and interviews with firm executives. We do not limit the type of announcement source in order to have the widest and most granular information possible on firms' RTO policies.

We restrict our Factiva search to articles published between March 1, 2020, and June 1, 2023. We then search for all articles containing one or more of the following keywords and phrases that might be indicative of their RTO policy choice: "hybrid work", "remote work", "working remotely", "remotely working", "return to work", "return to office", "return-to-office", "return to the office", "back to work", "back-to-work", "reopen", "work from home", "back to the office", "back to office", "flexible work", "working flexibly", "flexible working", "hybrid model", "return to workplace", "in person", "in-person". To maintain sequential continuity in the data gathering process

[4] See `https://www.dowjones.com/professional/glossary/factiva/` for more information.

and to track how firms' optimal response may have evolved over time, we sort the articles from oldest to newest. After sorting the articles from oldest to newest for each firm, we filter out any article that does not announce an explicit RTO policy. We do this because, in some cases, the discussion of the firm's RTO policy is too vague or ambiguous for us to determine the exact nature of where employees will be working (in office, at home, or a mix). In other cases, the article simply mentions that the firm plans to delay its RTO policy decision.[5]

This process identifies explicit RTO policy announcements for 362 of the firms in the initial search. There are many announcers for which we flag multiple articles containing one or more of our search phrases during the sample period, because announcers may make multiple distinct announcements. For example, a firm may make an initial RTO policy announcement early in the sample period, and then amend or change its RTO policy in an announcement later in the sample period. For announcers that make multiple announcements, we focus on the first announcement in order to avoid any feedback effects from the firm's initial announcement to subsequent announcements. While the first announcement should be determined only by economic variables and firm- and industry-specific characteristics, as well as *expected* stock market reaction, subsequent announcements will likely be based in part on the market reaction to the previous announcements.[6]

After obtaining a unique initial announcement for each of the 362 announcers that we find in Factiva, we use the Flex Index by Scoop to obtain RTO policies for as many of the remaining firms as possible. The Flex Index data records firm RTO policies using "a combination of online surveys and manual entry of publicly available information." According to their methodology, in cases where information is provided directly via online surveys, the submitting employee must have a work email address to "verify their employment." Additionally, once a company's RTO policy is posted, the Flex Index directly contacts executives at the company and gives them an opportunity to add to or edit the information provided by their employee.[7] We gather RTO policies for an additional 260 firms using the Flex Index.[8] Our Factiva and Flex Index searches yield a set of 622 firms, which we call "announcers." The remaining 311 firms are "non-announcers."

[5]For an example of an article that contains a discussion of RTO that is too vague to be considered an announcement, see Appendix A.2.2.

[6]For an example of a firm that makes multiple announcements, see Appendix A.2.3.

[7]See `https://www.flex.scoopforwork.com/about` for more information on the methodology.

[8]We note that the Flex Index does not track the *announcement date*, therefore we are unable to determine when the RTO policy was announced in these cases.

Before describing how we construct our policy classification system, we note two important assumptions. First, we assume that if a firm announces an RTO policy, then at least some of the employees can feasibly do some of their work remotely. If 100% of the jobs in a particular firm must be done in-person all the time, then it is reasonable to assume that the firm does not need to implement a policy to bring workers back into the office. Related to this, a second assumption we make is that, for firms that do announce (and therefore have some jobs that can be done remotely), the announcement pertains only to those employees who can feasibly work remotely. The vast majority of announcements do not explicitly mention whether the policy applies to corporate/headquarter employees or to all employees. However, it is reasonable to assume that, for a firm in the manufacturing industry, for example, the announced RTO policy only applies to corporate employees who can feasibly work remotely and not to other employees who must complete their job tasks in person.

2.2 Classifying RTO Policy Announcements

For the announcing firms in our sample, we use the Factiva announcement text to construct a classification system that captures how stringent the firm's RTO policy is. A more stringent policy is one that requires more in-person work, or that restricts the ability of employees to choose where they work, or both. A less stringent policy is one that allows more remote work, or that gives employees more ability to choose where they work, or both. We define four categories that lie along the continuum from most stringent to least stringent. The most stringent policy is In-person. An In-person policy requires 80% or more of a firm's employees to work in the office five days per week. On the other end of the spectrum is Remote, which is the least stringent policy. A Remote policy allows 80% or more employees to work remotely five days per week. In cases where an announcement does not explicitly specify 80%, we use one of two approaches. First, we use the presence of words and phrases such as "large majority" or "most employees" to determine whether the policy is likely to apply to 80% or more. For example, if the announcement specifies that "most employees" are expected in the office five days per week, we classify it as In-person. Alternatively, we use the announcement text to determine whether the announcing firm is referring to a company-wide policy which is likely to apply to the vast majority of employees. For example, if an announcement states that "the firm" is adopting a virtual-first approach where employees are given the freedom to determine how often they wish

to come in (if at all), we classify it as a Remote policy.

After defining the policies at either end of the stringency spectrum, we define two additional policies that lie on the interior. The first is Hybrid. A Hybrid policy is one in which 80% or more of a firm's employees are expected in the office at least one day per week, but allowed to work remotely at least one day per week. We do not distinguish between Hybrid policies with different proportions of in-person and remote work. Once again, in instances where firms do not specify the exact percentage of employees its hybrid policy applies to, we rely on the presence of words or phrases that suggest firm-wide applicability of the chosen policy. Our second interior policy is Flexible. The key distinguishing feature of a Flexible policy is that it allows for the RTO decision to be made by lower-level managers on an employee-by-employee or team-by-team basis. Unlike firms with Hybrid, In-person, or Remote policies, firms with Flexible policies do not have a blanket, firm-level policy that applies to all employees. Rather, Flexible policies give workers and their managers individual-level discretion over how the return to office is achieved. A Flexible policy may result in certain employees working 100% Remote, whereas other employees work In-person or Hybrid. However, with a Flexible policy, the specific RTO policy for each employee is not a firm-wide decision, but one that happens at the individual or team level.

In addition to these four policies, we define a fifth policy type called Mixed. Firms that use Mixed policies specify different RTO policies for different types of employees. In order for the policy to be defined as Mixed, the announcement must indicate that at least two of the other four policies are used. For example, if the firm announces that 50% of employees will be In-person and 50% will work under a Hybrid setup, this is considered Mixed. The key distinguishing factor between Mixed and Flexible is that Mixed policies do not give lower-level managers or employees discretion over how they will return to office, even though employees follow different RTO policies depending on their role. A Mixed policy can entail various levels of stringency. For example, a policy that utilizes a 50/50 mix of fully remote and hybrid work is less stringent than a policy that entails a 50/50 mix of hybrid and fully in-person work. Because of this, we lump this category in with Hybrid and Flexible in the baseline multivariate analysis. Appendix A.2.1 provides examples of all five policy announcement types.

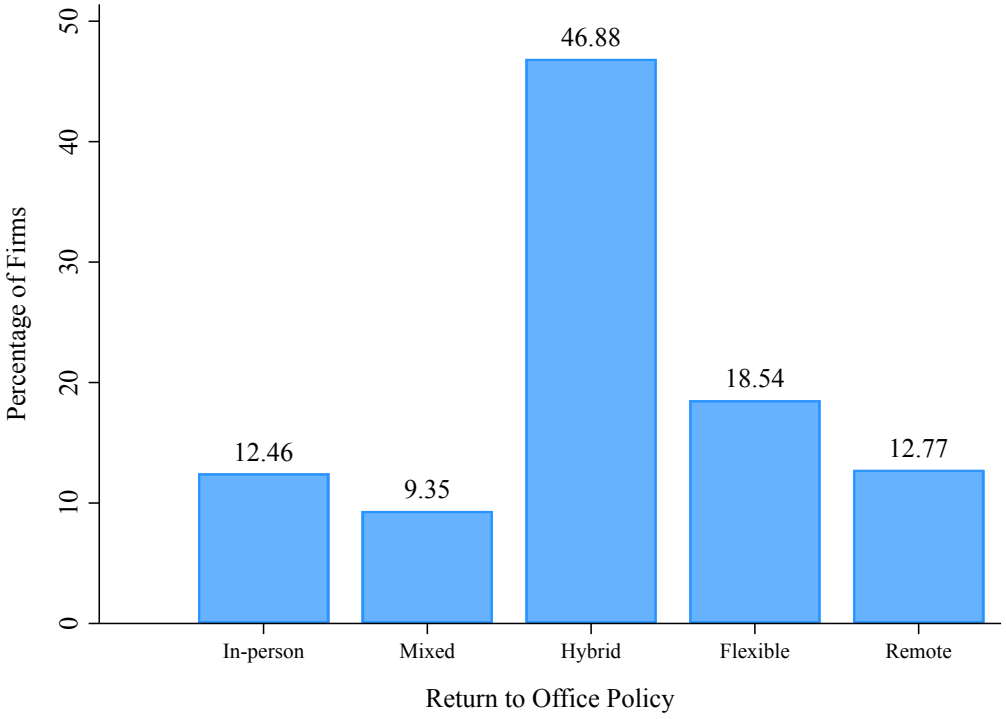
We construct our classification system solely based on the text of the Factiva announcements. In cases where a firm's announcement comes from the Flex Index, we map the Flex Index classification to ours and assign each firm from the Flex Index a category from our classification system. The Flex Index classifies RTO policies

into 8 categories: Fully Remote, Employee's choice, Minimum days a week, Specific days a week, Minimum & specific days a week, Minimum percentage of time, Full time in office, and Flexible. We map these categories into our own as follows. Our Remote classification is equivalent to Flex Index Fully remote and Flex Index Employee's choice. Our In-person classification is equivalent to Flex Index Full time in office. Our Flexible classification is equivalent to Flex Index Flexible. Our Hybrid classification is equivalent to Flex Index Minimum days a week, Flex Index Specific days a week, Flex Index Minimum & specific days a week, and Flex Index Minimum percentage of time. Our Mixed classification does not map to any of the Flex Index categories.

2.3 Distribution of Policy Announcements

Figure 1 summarizes the frequency distribution of RTO policies. The majority of announcing firms adopted a Hybrid or Flexible policy that entails a mix of in-person and remote work. Notably, most firms do not opt for a policy at one of the extremes: fully In-person and fully remote each comprise less than one-fifth of the announced policies.

Figure 1: RTO Policies for Russell 1000 Constituents



Notes: 1) This figure plots the percentage of Russell 1000 firms that announce by type of RTO policy from March 1, 2020, to June 1, 2023. 2) Authors' classification using Factiva and the Flex Index.

The firms announcing an RTO policy during our sample period are larger than those that did not make any policy announcements, as shown in Table 1, and this difference is significant at the 1% level.

Table 1: Firm Size for Announcers vs. Non Announcers

	N	Mean	Median	SD	Min	Max
Non Announcer	311	14.28	7.29	20.17	0.37	148.19
Announcer	622	59.81	14.01	203.65	0.44	2687.38

Notes: 1) This table presents summary statistics of firm size, as measured by total assets reported in billions of dollars (from Compustat) for announcers and non-announcers. Announcers are firms that made RTO policy announcements between March 1, 2020 and June 1, 2023, obtained either via Factiva or from the Flex Index database. Non-announcers are firms for which we do not find any RTO policy announcements within our sample period either through Factiva or the Flex Index. 2) Data is from Factiva and Compustat. 3) Announcers without announcement dates are firms whose RTO policies are obtained from the Flex Index.

Figure 1 does not differentiate between firms which announce RTO policies early and firms which make announcements later. Announcement timing may be important because public health concerns were likely a greater determinant of firm policies in the early part of our sample period. In contrast, in the latter part of the sample period, vaccines had been widely rolled out and mitigated the impact of health concerns on firm policy.

To investigate whether the RTO policy announcement depends on when the announcement is made, we split the sample into Early Announcers and Late Announcers. Early Announcers are firms which announced their first round RTO policies between March 1, 2020, and June 30, 2021. Late Announcers are firms that made their first round RTO policy announcements between July 1, 2021, and June 1, 2023.[9] We define Early and Late in this way in order to capture the fact that, by 2021Q3, COVID-19 vaccines were widely rolled out.[10] Therefore, announcements made during or after 2021Q3 are less likely to be driven primarily by health concerns and more by firms' long-run expectations about the post-COVID-19 environment. Figure 2 compares Early vs Late Announcers in terms of the frequency of the RTO policy types.

[9]Because we cannot observe announcement dates in the Flex Index data, we do not include those firms for which we only have RTO policy type from the Flex Index in this analysis.

[10]By July 2, 2021, roughly 67% of the U.S. adult population had received one vaccine dose and 47% had received two doses (https://www.cbsnews.com/news/biden-covid-19-vaccine-goal-missed/).

Figure 2: RTO Policies for Early vs. Late Announcers



Notes: 1) This figure plots the percentage of Russell 1000 firms that announce early v.s. late, from March 1, 2020, to June 1, 2023. Early Announcers made their first round RTO policy announcements between March 1, 2020, and June 30, 2021, and Late Announcers made their first round RTO policy announcements between July 1, 2021, and June 1, 2023. 2) Data is from Factiva.

A key difference between groups is that Early Announcers opted for more of the extremes relative to Late Announcers. Early Announcers announce more In-person policies and Remote policies, whereas Late Announcers announced more Hybrid and Flexible. An additional difference is in firm size. Table 2 shows that Early Announcers tend to be larger than Late Announcers. This suggests that Early Announcers may be industry leaders that other firms within the industry use as a gauge of how the market will react to their decisions. Therefore, in addition to Late Announcers' policies being less sensitive to public health concerns, their policies may also be a function of the observed reaction to Early Announcer policies.

Table 2: Firm Size for Early vs. Late Announcers

	N	Mean	Median	SD	Min	Max
Early Announcer	102	160.42	28.01	428.77	0.95	2687.38
Late Announcer	260	50.39	14.40	137.32	0.45	1927.56
Flex Index Announcer	260	29.76	11.62	62.51	0.44	551.67

Notes: 1) This table presents summary statistics of firm size, as measured by total assets reported in billions of dollars (from Compustat) for different announcement groups as of December 2019. Early Announcers made their first round RTO policy announcements between March 1, 2020, and June 30, 2021, and Late Announcers made their first round RTO policy announcements between July 1, 2021, and June 1, 2023. Flex Index Announcers are firms whose RTO policies were retrieved from the Flex Index. 2) Data is from Factiva and Compustat. 3) Announcers without announcement dates are firms whose RTO policies are obtained from the Flex Index.

2.4 Variation Across Industries, Cities, and Firms

Consistent with certain industries having a greater share of occupations that can be done remotely, the number of firms that publicly announce a policy varies substantially across industries. For example, while over 75% of firms in the Professional Services, Information, and Retail Trade industries had announced a policy by June 1, 2023, less than 50% of firms in the Mining/Oil&Gas and Real Estate industries had announced a policy by the end of our sample period. For the firms that did announce, Figure 3 examines variation in RTO policies across 2-digit NAICS sectors. The figure reports the top 12 2-digit NAICS sectors by number of firms. Mining/Oil&Gas and Transportation firms announce relatively more in-person work than remote work, whereas firms belonging to the Professional Services, Administrative Services, Finance, and Information sectors announce relatively more remote work.

To provide an alternative view of how RTO policies vary across industries, we next examine how the pre-pandemic feasibility of remote work in an industry is related to the type of RTO policy that we see used most often in that industry. We use the share of jobs that can be done at home by 2-digit NAICS code from Dingel and Neiman (2020) (see Table 3 of their paper) to measure remote work feasibility. We then plot the distribution of this remote work share weighted by earnings which we call *DN2020 WFH Share (Earnings Weighted)*, for each of the five RTO policies we observe. Figure 4 reports the results. Comparing the Remote and In-person panels shows that Remote announcers tend to be in industries with higher remote work feasibility shares compared to In-person announcers. This is consistent with more in-person work poli-

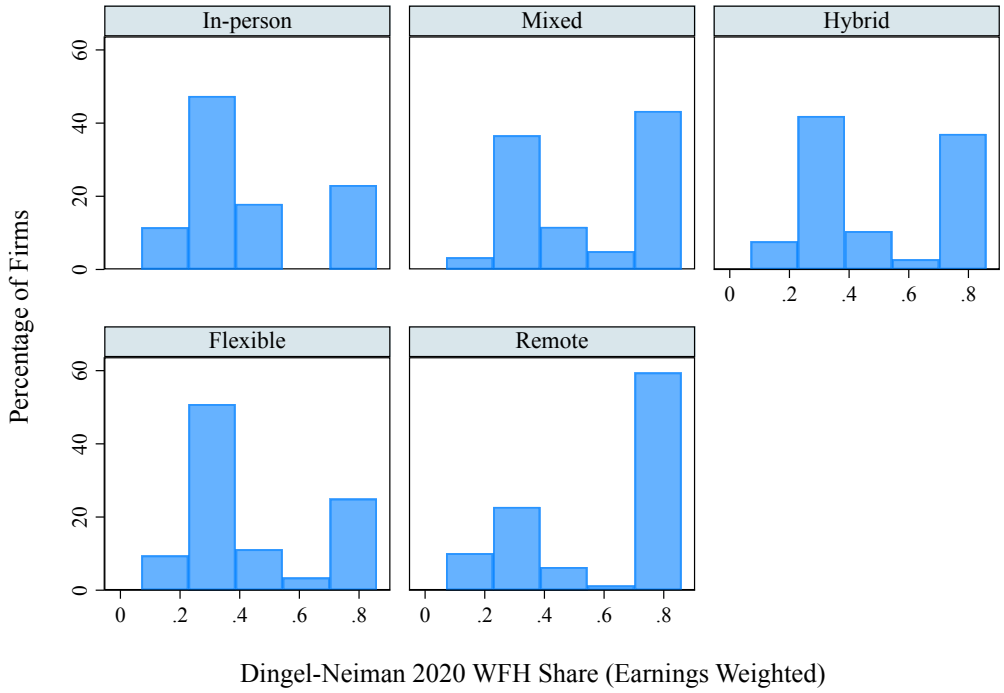
Figure 3: RTO Policies by Industry



Notes: 1) This figure plots the percentage of Russell 1000 firms that announce by type of RTO policy, across the top 12 2-digit NAICS sectors by number of firms, from March 1, 2020, to June 1, 2023. 2) Data is from Factiva and the Flex Index.

cies being announced in industries with a lower pre-pandemic share of jobs that can be done remotely.

Figure 4: RTO Policies and Dingel-Neiman Remote Work Feasibility



Notes: 1) This figure plots the density of the Dingel and Neiman (2020) work-from-home feasibility measure (at the 2-digit NAICS level) by RTO policy, for all Russell 1000 firms that announce from March 1, 2020, to June 1, 2023. 2) Data is from Factiva, the Flex Index, and Dingel and Neiman (2020).

We next examine variation in RTO policies by the location of firms' headquarters (HQ). As models of WFH such as Davis, Ghent, and Gregory (forthcoming) illustrate, the benefits of more remote work depend on the length of workers' commutes, the steepness of the rent gradient, and the differences in amenities between suburban and central locations. Furthermore, firms in different cities likely have a different mix of occupations making remote work more feasible for a larger fraction of firms in some cities than in others. All of these factors vary by city such that firms' policies may differ by the city of their HQ.

We identify firms' HQ locations based on Metropolitan Statistical Area (MSA). We then examine the variation in initial RTO policies across the top 12 most common

MSAs for the firms in our sample. As Figure 5 illustrates, firms headquartered in Houston and Los Angeles announce relatively more in-person work, whereas firms headquartered in Philadelphia, New York/New Jersey, Denver, Boston, Atlanta, and Washington, DC, announce relatively more work that is on the remote end of the spectrum. San Francisco and San Jose are notable for having especially high shares of entirely Remote policies, likely in part due to the concentration of their workforce in information technology.

Figure 5: RTO Policies by HQ location



Notes: 1) This figure plots the percentage of Russell 1000 firms that announce by type of RTO policy, across the top 12 MSAs, from March 1, 2020, to June 1, 2023. 2) Data is from Factiva, Flex Index, Compustat, and the Department of Labor.

Firm-specific characteristics may also influence RTO policy choice. Figures 6 and 7 show the distribution of RTO policy for firms that lie above and below the mean by size and age. Larger and older firms tend to choose fewer Remote policies.

Figure 6: RTO Policies by Firm Size



Notes: 1) This figure plots distribution of RTO policies for Russell 1000 firms by firm size, measured by total assets from Compustat. The mean size of firms that announce an RTO policy between March 1, 2020, and June 1, 2023, is about $81 billion. 2) Data is from Factiva, the Flex Index, and Compustat.

Figure 7: RTO Policies by Firm Age



Notes: 1) This figure plots distribution of RTO policies Russell 1000 firms by firm age, measured as the number of years between the firm's IPO date and 2019. The mean age for firms that announce a policy is about 32 years. 2) Data is from Factiva, the Flex Index, and Compustat.

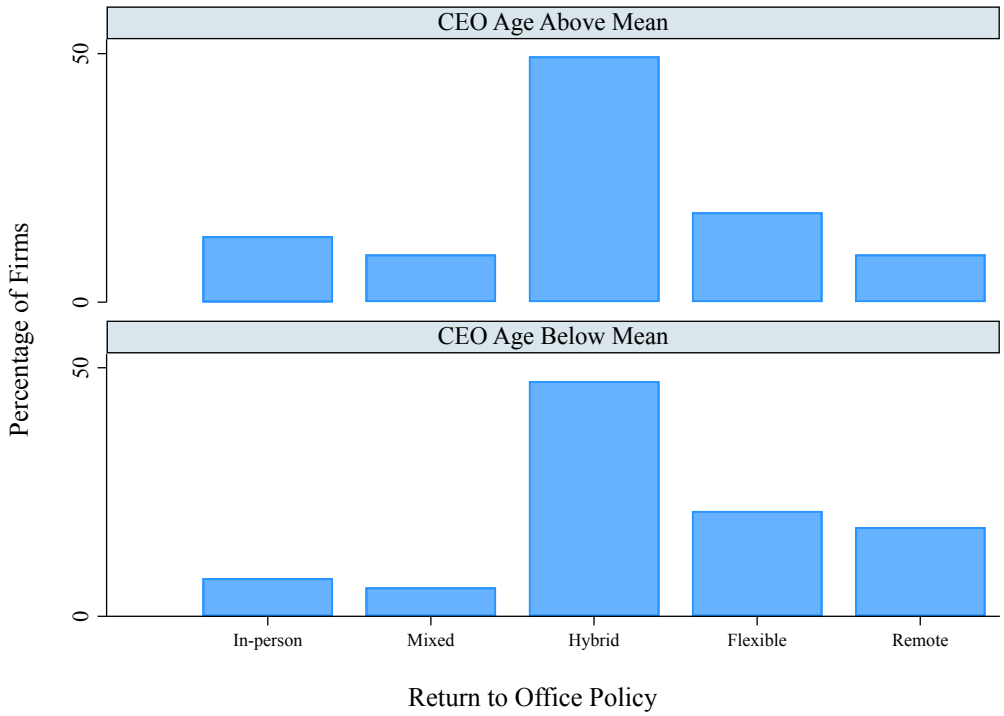
Finally, we examine variation across RTO policies based on CEO characteristics. We focus on the RTO policy type across two CEO attributes: age and gender. All CEO data comes from BoardEx. Figures 8 and 9 show the results by CEO gender and for CEOs below and above the median CEO age. While both male and female CEOs most frequently choose a Hybrid RTO, a higher proportion of female CEOs choose fully Remote working arrangements. CEOs below the mean age favor more Remote and fewer In-person policies compared to CEOs above the mean age.

Figure 8: RTO Policies by CEO's Gender



Notes: 1) This figure plots distribution of RTO policies by the gender of the CEO of firms in our sample. 3) Data is from Factiva, the Flex Index, and BoardEx.

Figure 9: RTO Policies by CEO's Age



Notes: 1) This figure plots distribution of RTO policies by CEO age. The mean CEO in our sample is about 60 years old. 2) Data is from Factiva, the Flex Index, and BoardEx.

3 Conceptual Framework

Motivated by the differences in RTO policies across industries and cities that we document in the previous section, in this section we provide a simple conceptual framework that formalizes the determinants of the choice of RTO policy. We consider a simple production economy similar to Jermann (1998) with a firm operating in industry j in city c. The model is partial equilibrium and is intended to capture the main tensions employers face when choosing on a RTO policy denoted by $P_{j,c,t} \in [0, 1]$. The firm's choice of $P_{j,c,t}$ influences its total factor productivity (TFP), how much rent they pay for office space, and their wage bill. To focus on the implications of RTO policies, we treat the discount factor as fixed, investors as risk-neutral, and abstract from frictions to capital adjustment. We also simplify the model by assuming that reductions in productivity from greater remote work occur contemporaneously rather than in the

future.

Firms are 100% equity financed and the stock price $S_{j,c,t}$ is the expected present value of profits to owners, i.e.,

$$S_{j,c,t} = E_t \sum_{k=0}^{\infty} \beta^k \Pi_{j,c,t+k}.$$

Profits in period t are given by

$$\Pi_{j,c,t} = A(P_{j,c,t})F(K_{j,c,t}, N_{j,c,t}) - \alpha_1 r^o_{c,t} N_{j,c,t} g(P_{j,c,t}) - \hat{w}_j(P_{j,c,t}) N_{j,c,t} \tag{1}$$

where $A_{j,c,t}(P_{j,c,t})$ is total factor productivity, which depends on the firm's RTO policy, $P_{j,c,t}$, $K_{j,c,t}$ is the non-real estate capital the firm owns, $\alpha_1 r^o_{c,t} g(P_{j,c,t})$ is the total amount the firm pays to rent office space (which it rents in proportion to the amount of labor it hires), and $N_{j,c,t}$ is labor hired at rate $\hat{w}(P_{j,c,t})$. A higher value of P corresponds to a firm policy requiring that a larger fraction of work be done in-person at a centralized location, or what we refer to as a more stringent RTO policy. We normalize a 100% remote RTO policy as $P = 0$ and a five days a week in-person RTO policy to $P = 1$. We anticipate that $A'(.) > 0$ such that a more stringent RTO policy increases TFP. More in person work requires more office space such that $g'(.) > 0$.

The firm rents only the office space that employees use when they are working at the office. Although employees may also use space at home, we assume that firms indirectly compensate employees for home office space via wages. Office space does not directly enter the production function; any difference between the productivity of space used in the office and at home is subsumed into $A_{j,c,t}(.)$. Office rents differ only across cities, whereas wages differ across both industries and cities to capture that employees in different markets may face different residential rents and commute times.

The nominal wage $\hat{w}(P_{j,c,t})$ compensates employees for the disutility of working, which depends directly on (1) the firm's RTO policy (because employees prefer more work from home to less), (2) the length of their commute, τ_c, and (3) the cost of space they rent at home, $r^h_{c,t}$. We specify

$$\hat{w}_j(P_{j,c,t}) = w_j + (\alpha_2 + \alpha_3 \tau_c - \alpha_4 r^h_{c,t}) g(P_{j,c,t}). \tag{2}$$

In equation 2, w_j represents the fixed wage paid in industry j for a worker that is

100% remote. α_2 captures the change in the wage required for a policy requiring more time in person. The experimental evidence in Mas and Pallais (2017), He et al. (2021), and Moens et al. (2022) indicates that $\alpha_2 > 0$. $\alpha_3\tau_c$ captures the change in wage required for more in-person work if labor supply depends on commuting costs. As the evidence in Ready, Roussanov, and Zurowska (2019) indicates, labor supply decreases with commuting costs, which suggests $\alpha_3 > 0$. Finally, because employees that work more at home require more residential space (see Stanton and Tiwari, 2021), we anticipate $\alpha_4 > 0$ to reflect firms indirectly paying employees to rent their own space and business equipment at home.

The firm chooses $P_{j,c,t}$ to maximize equation (1) taking the wage function in equation (2) as given. This leads to the following optimization condition:

$$A'(P_{j,c,t})F(K_{j,c,t}, N_{j,c,t}) - (\alpha_1 r^o_{c,t} + \alpha_2 + \alpha_3\tau_c - \alpha_4 r^h_{c,t})g'(P_{j,c,t})N_{j,c,t} = 0. \tag{3}$$

Equation 3 indicates that firms will increase the amount of in-person work they require until the productivity benefit is equal to the cost associated with office space and the in-person wage premium. It provides the following predictions about how firms choose their RTO policies:

1. Firms in industries with more productivity loss from remote work, as captured by the derivative of TFP with respect to RTO policy, will choose higher P,
2. Firms renting space in locations with higher office rents will choose lower P,
3. Firms with workers in cities with longer commutes will choose lower P, and
4. Firms with workers in cities with more expensive residential space will choose higher P.

4 Determinants of RTO Policies

In this section, we examine factors that impact a firm's choice of RTO policy in a multivariate setting.

Our model and other existing spatial models of remote work (Davis et al., forthcoming; Delventhal and Parkhomenko, 2023; Behrens et al., 2021) identify three key

factors that should affect firms' choice of an RTO policy. First, the benefits to remote work are greater when it is relatively more productive. In the simple model of Section 3, $A(P_t)$ captures the productivity of remote work and the function depends on the occupational composition of the workers in the firm. We proxy for the relative productivity of remote work using the Dingel and Neiman (2020) measure of the feasibility of remote work, which is based on pre-pandemic data. This industry-level measure is computed using (1) the share of occupations in each industry (where occupations are defined using the BLS Standard Occupation Classification system) and (2) occupation-level survey responses that indicate the extent to which different occupations can be performed at home (survey data comes from the Department of Labor's O*NET program). A higher fraction of work from home feasibility indicates that an industry contains a larger share of occupations that can be done partially, or fully, from home. We therefore define industries with higher work from home feasibility as industries in which the ex-ante relative productivity of remote work is higher.[11]

The second key factor that determines remote work policy is employee commute time. Because longer commutes impose higher costs on employees (both directly and due to loss of leisure), the benefits of remote work for the employee increase with commute time. Therefore, employees will accept lower wages to work remotely when the disutility of commuting is high. To measure commute time at the MSA level, we use survey responses on average commute times from the 2019 Census Bureau American Community Survey (ACS).

Finally, the benefit of more remote work increases with the price of commercial office space, but decreases with the price of residential real estate. In particular, in cities where office space is expensive to rent, we expect firms to choose more remote work. Conversely, when housing is expensive, we expect firms to choose more in-person work, given they must compensate employees for home office space through higher wages. We measure office rent at the MSA level using Compstak. Specifically, we estimate the quarterly median net effective rent per square foot for all office leases signed during 2019 in each MSA. Then, we calculate the mean of this variable across all quarters by MSA. We measure home prices by first calculating the median monthly listing price per square foot for each MSA in 2019 reported by Realtor.com. We then calculate the mean of this variable across all months in 2019 by MSA.

In addition the economic determinants of RTO policies, we examine several firm-

[11] We use shares at the 2-digit NAICS level taken directly from Table 3 of Dingel and Neiman (2020).

specific, non-economic determinants, including firm size, age, and CEO characteristics. We gather firm size, age, and headquarter location data from Compustat. We use BoardEx to obtain data on CEO gender and age.

4.1 Main Results

Table 3 summarizes the data used in our multivariate analysis. We measure all variables at the end of 2019. The average firm is in an industry where roughly half of workers are in a telecommutable occupation as defined by Dingel and Neiman (2020). The average one-way commute time in the headquarters location is approximately 28 minutes, the average median rent per square foot for office property is approximately $30, and the average median price per square foot for residential property is roughly $243. The average CEO is approximately 60 years old and 7% of CEOs are female.

Table 3: Summary Statistics

	N	Mean	p50	SD	Min	Max
Total Assets ($bn)	622	59.8	14.0	203.6	0.4	2687.4
Firm Age (as of 2019)	622	31.8	26.0	22.4	0.0	73.0
WFH Feasibility Share	619	0.53	0.41	0.24	0.07	0.86
Average Commute Time (minutes)	567	27.8	27.6	4.0	18.3	35.0
Office Rent/sf	583	29.8	24.5	13.2	11.6	56.2
Home Price/sf	569	243.0	163.3	156.6	87.8	682.3
CEO Age (as of 2019)	532	59.6	60.0	7.1	36.0	89.0
Female CEO	532	0.07	0.00	0.276	0.00	1.00

Notes: 1) Summary statistics at the firm level for Russell 1000 firms from March 1, 2020, to June 1, 2023. 2) Data is from Factiva, Compustat, Dingel and Neiman (2020), Census ACS of 2019, Compstak, Realtor.com, BoardEx, and the Flex Index. All variables are measured as of the end of 2019. 3) All variables defined in Table A.1.

We study the relation between the type of RTO policy for announcers and the determinants described in the previous section. In our baseline specification, we estimate an ordered probit regression in which the dependent variable is equal to 3 if the firm announces an In-person policy, 2 if the firm chooses a Hybrid or Flexible or Mixed policy, and 1 if the firm opts for a fully Remote policy. We combine Hybrid, Flexible, and Mixed because all three constitute interior solutions relative to the extremes of

fully in-person or fully remote.[12] Our estimating equation is:

$$(4)\ P_{i,c,j,t} = \beta_1 WFHFeasibilityShare_j + \beta_2 \tau_c + \beta_3 OfficeRent_c + \beta_4 HomePrice_c + \beta_x X_{i,t} + \epsilon_{i,t}$$

where $P_{i,c,j,t}$ is the RTO policy announced at time t by firm i, where i is headquartered in city c and industry j. We include the Dingel and Neiman (2020) shares ($DNShare$), one-way commute time (τ_c), median office rent, and median residential price in the regression as indicators equal to 1 when the respective value is above the sample mean, and 0 otherwise. $X_{i,t}$ includes indicators for firm size and age above their respective means, as well as for CEO age above mean and CEO gender.

Table 4 presents pairwise correlation coefficients for the four economic variables we include in equation 5.

Table 4: Correlations between Economic Variables

	WFH Share	Office rent	Residential price	Commute time
WFH Feasibility Share	1.00			
Office Rent	0.23	1.00		
Home Price	0.13	0.79	1.00	
Commute Time	0.20	0.74	0.37	1.00

Notes: 1) Pairwise correlation coefficients for economic variables for Russell 1000 firms with announcements from March 1, 2020 and June 1, 2023. 2) Data is from Dingel and Neiman (2020), Census ACS of 2019, Compstak, and Realtor.com. All variables are measured as of the end of 2019. 3) All variables defined in Table A.1.

Table 5 reports the results of estimating equation (5). Columns 1-3 include the industry-specific WFH feasibility share, city-specific real estate prices, and city-specific commute times separately. In column 4, we include all three city-specific measures, and in column 5 we include all four economic determinants. Finally, column 6 includes firm characteristics, and column 7 includes CEO characteristics. The results suggest that firms in industries with high ex-ante WFH feasibility tend to choose policies that allow for more remote work: in columns 1 and 5-7, a WFH feasibility share above the mean is strongly negatively related to the stringency of RTO policy. The coefficient on the WFH feasibility share in column 6 is associated with a marginal

[12] In robustness analysis in Section 4.2, we estimate equations in which Flexible and Hybrid are included separately alongside In-person and Remote.

effect of -0.06 with respect to an In-person policy. This indicates that as the industry WFH feasibility share goes from below the mean to above the mean, the probability of announcing a fully in-person policy decreases by roughly 6%, assuming all other independent variables are held at their mean values. In contrast, the marginal effect with respect to a Remote policy is 0.06, indicating that the probability of announcing a fully remote policy increases by roughly 6%, holding other covariates at their means. In addition to industry playing a role in the type of RTO policy, columns 5-7 indicate that the price of office space is an important determinant. Focusing on column 6 again, the negative coefficient on the indicator for above mean office rent indicates that firms in cities with more expensive office space tend to choose less in-person work. The marginal effect with respect to an In-person policy is -0.08, which indicates that the probability of announcing fully in-person work is 8% lower for firms in cities with below-average office rent compared to firms in cities with above-average office rent.

Finally, columns 6 and 7 indicate that firm and CEO characteristics play a role in the choice of RTO policy. In particular, large firms tend to choose more in-person work compared to smaller firms. In column 6, the marginal effect on the coefficient for firm size with respect to an In-person policy is 0.08, indicating that firms with above-average size are 8% more likely to choose fully in-person policies compared to other firms. Column 7 shows that firms with female CEOs tend to announce less stringent RTO policies. The marginal effect on the female CEO indicator in column 7 is -0.06 for In-person, compared to 0.10 for Remote.

Table 5: RTO Policy Choice: Baseline Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
WFH Feasibility Share Above Mean	-0.38***				-0.30***	-0.33***	-0.31**
	(0.10)				(0.11)	(0.11)	(0.12)
Office Rent Above Mean		-0.32		-0.39*	-0.37	-0.40*	-0.41
		(0.21)		(0.23)	(0.24)	(0.24)	(0.28)
Home Price Above Mean		-0.07		-0.01	0.02	0.08	0.02
		(0.21)		(0.21)	(0.22)	(0.23)	(0.26)
Commute Time Above Mean			-0.06	0.11	0.14	0.14	0.15
			(0.10)	(0.13)	(0.13)	(0.13)	(0.14)
Above Mean Firm Size						0.35**	0.41***
						(0.14)	(0.15)
Above Mean Firm Age						0.13	0.10
						(0.11)	(0.12)
CEO Age Above Mean							0.14
							(0.12)
Female CEO							-0.46***
							(0.16)
Observations	619	566	567	533	531	531	471
Pseudo-R^2	0.02	0.02	0.00	0.01	0.02	0.04	0.05

Notes: 1) Results of estimating ordered probit regressions of announcement likelihood on controls. The dependent variable takes a value of 3 for In-person, a value of 2 for Hybrid or Flexible or Mixed, and a value of 1 for Remote. Sample consists of Russell 1000 firms that announce a RTO policy from March 1, 2020, to June 1, 2023. 2) Data is from Factiva, Compustat, Dingel and Neiman (2020), Census ACS of 2019, Compstak, Realtor.com, BoardEx, and the Flex Index. All variables are measured as of the end of 2019. 3) All variables defined in Table A.1. 4) t-statistics are calculated based on robust standard errors and are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Overall, the results in Table 5 indicate that industry characteristics and office rent play important roles in determining the amount of in-person work firms require. However, it may be the case that firms' choice of RTO policies conditional on these economic characteristics changes over the sample period. This could occur for two reasons. First, firms that announce early in the sample period, prior to the widespread roll-out of vaccines, may have based their decisions in part on uncertainty about health risks, whereas later announcers did not. Second, later announcers may have conditioned their RTO choice in part on the choices of early announcers. To investigate the extent to which announcement timing matters, we conduct two analyses. First, we reproduce columns 5 and 6 of Table 5 with only the announcements made during or after 2021Q3. We call this the "late announcement" period as it constitutes the part of our sample period in which vaccines had been widely rolled out. Second, we reproduce columns 5 and 6 of Table 5 with the full sample and the inclusion of an indicator equal to 1 for announcements made during or after 2021Q3, and 0

for announcements made prior, which we call 'LateAnnouncement.' Because the Flex Index does not contain the announcement date, all firms for which we gather data from the Flex Index are excluded from the estimation sample.

Table 6 reports the results. The results for industry WFH feasibility share and commercial rent remain qualitatively unchanged regardless of whether we restrict the sample to the post-vaccination roll-out period (columns 1, 2 and 5), or whether we include a control for the post-vaccination roll-out period (columns 3, 4 and 6).

Table 6: RTO Policy Choice: Role of Announcement Timing

	(1)	(2)	(3)	(4)	(5)	(6)
WFH Feasibility Share Above Mean	-0.34*	-0.33*	-0.26*	-0.24*	-0.30	-0.24
	(0.18)	(0.17)	(0.14)	(0.14)	(0.18)	(0.15)
Office Rent Above Mean	-0.60***	-0.61***	-0.80***	-0.81***	-0.66***	-0.84***
	(0.18)	(0.18)	(0.24)	(0.25)	(0.19)	(0.28)
Home Price Above Mean	-0.15	-0.11	0.18	0.27	-0.23*	0.24
	(0.13)	(0.13)	(0.22)	(0.23)	(0.13)	(0.25)
Commute Time Above Mean	0.57***	0.57***	0.32*	0.32*	0.63***	0.30
	(0.20)	(0.20)	(0.17)	(0.17)	(0.23)	(0.19)
Above Mean Firm Size		0.15		0.18	0.17	0.27
		(0.24)		(0.19)	(0.28)	(0.21)
Above Mean Firm Age		0.10		0.22	0.11	0.21
		(0.21)		(0.16)	(0.23)	(0.18)
CEO Age Above Mean					-0.061	0.17
					(0.21)	(0.16)
Female CEO					-0.71**	-0.56***
				(0.29)	(0.21)	
LateAnnouncement			-0.04	0.00		-0.02
			(0.17)	(0.17)		(0.19)
Sample	Post-2021Q2	Post-2021Q2	Full	Full	Post-2021Q2	Full
Observations	222	222	313	313	195	275
Pseudo-R^2	0.06	0.07	0.04	0.05	0.09	0.08

Notes: 1) Results of estimating ordered probit regressions of announcement likelihood on controls. The dependent variable takes a value of 3 for In-person, a value of 2 for Hybrid or Flexible or Mixed, and a value of 1 for Remote. Sample consists of Russell 1000 firms that announce a RTO policy from March 1, 2020, to June 1, 2023. 2) Data is from Factiva, Compustat, Dingel and Neiman (2020), Census ACS of 2019, Compstak, Realtor.com, BoardEx, and the Flex Index. All variables are measured as of the end of 2019. 3) All variables defined in Table A.1 4) t-statistics are calculated based on robust standard errors and are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Given the role of the industry WFH feasibility share as a predictor for the type of RTO policy a firm chooses, we further investigate the importance of industry (defined by 2-digit NAICS codes) by reestimating equation 5 using industry indicators in place of the WFH feasibility share variable. The advantage of this approach is that

it allows us to understand exactly which industries are more likely to announce RTO policies of varying levels of stringency. In this analysis, we drop any industry with fewer than ten announcers in order to allow us sufficient within-industry variation to estimate the indicator coefficients. Table 7 reports the results. The excluded industry is Mining/Oil & Gas.[13] The results indicate that, consistent with Figure 3, industries such as Professional Services and Information are likely to allow significantly more remote work.

4.2 Alternative Specifications

In this section, we report the results of two alternative specifications for the baseline results in Table 5. First, we reproduce Table 5 using continuous independent variables instead of indicators. The advantage of this approach is that we are able to capture average effects, but the downside is that the interpretation of coefficients in terms of marginal effects is less straightforward compared to using indicators on the right-hand side. Table 8 reports the results. Broadly, the industry WFH feasibility share and firm size remain significant, but office rents are insignificant when included as a continuous variable.

[13]Note that Accommodation and Food Service drops out due to lack of sufficient announcements within the industry once we require CEO characteristics as controls in columns 3, 4, and 5.

Table 7: RTO Policy Choice: Industry Heterogeneity

	(1)	(2)	(3)	(4)	(5)
Utilities	-0.88*	-0.95**	-0.82*	-0.52	-0.55
	(0.47)	(0.48)	(0.50)	(0.60)	(0.56)
Manufacturing	-1.09***	-1.08***	-0.99***	-1.27**	-1.21**
	(0.36)	(0.38)	(0.38)	(0.50)	(0.49)
Wholesale Trade	-1.42***	-1.36***	-1.30***	-1.37***	-1.33***
	(0.38)	(0.40)	(0.42)	(0.47)	(0.47)
Retail Trade	-0.78*	-0.75*	-0.72	-0.89	-0.70
	(0.41)	(0.43)	(0.45)	(0.61)	(0.56)
Transport/Warehousing	-0.70*	-0.71	-0.78*	-0.68	-0.91
	(0.42)	(0.44)	(0.45)	(0.68)	(0.61)
Information	-1.59***	-1.54***	-1.43***	-1.63***	-1.73***
	(0.39)	(0.41)	(0.42)	(0.57)	(0.54)
Finance/Insurance	-1.18***	-1.31***	-1.23***	-1.29**	-1.09**
	(0.38)	(0.40)	(0.41)	(0.53)	(0.50)
Real Estate	-0.73*	-0.62	-0.49	-0.92*	-0.48
	(0.41)	(0.44)	(0.44)	(0.54)	(0.52)
Prof, Scientific & Tech Services	-1.73***	-1.66***	-1.60***	-1.90***	-1.77***
	(0.43)	(0.45)	(0.47)	(0.66)	(0.57)
Accommodation & Food Services	-1.21**	-1.11*			
	(0.62)	(0.64)			
Office Rent Above Mean	-0.20	-0.26	-0.36	-0.34	-0.59**
	(0.27)	(0.27)	(0.31)	(0.27)	(0.29)
Home Price Above Mean	-0.09	-0.02	0.02	-0.34	0.22
	(0.25)	(0.25)	(0.29)	(0.22)	(0.25)
Commute Time Above Mean	0.10	0.10	0.07	0.49**	0.20
	(0.13)	(0.13)	(0.14)	(0.24)	(0.19)
Above Mean Firm Size		0.37**	0.43**	0.10	0.20
		(0.16)	(0.17)	(0.32)	(0.24)
Above Mean Firm Age		0.13	0.10	0.04	0.24
		(0.12)	(0.13)	(0.23)	(0.19)
CEO Age Above Mean			0.10	-0.16	0.10
			(0.13)	(0.23)	(0.17)
Female CEO			-0.42**	-0.44**	-0.43**
			(0.17)	(0.22)	(0.20)
LateAnnouncement					-0.08
					(0.20)
Sample	Full	Full	Full	Post-2021Q2	Full
Observations	502	502	441	188	266
Pseudo-R^2	0.06	0.07	0.08	0.14	0.13

Notes: 1) Results of estimating ordered probit regressions of announcement likelihood on controls. The dependent variable takes a value of 3 for In-person, a value of 2 for Hybrid or Flexible or Mixed, and a value of 1 for Remote. Sample consists of Russell 1000 firms that announce a RTO policy from March 1, 2020, to June 1, 2023. 2) Data is from Factiva, Compustat, Dingel and Neiman (2020), Census ACS of 2019, Compstak, Realtor.com, BoardEx, and the Flex Index. All variables are measured as of the end of 2019. 3) All variables defined in Table A.1. 4) t-statistics are calculated based on robust standard errors and are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table 8: Alternative Specification 1: Continuous Independent Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
WFH Feasibility Share	-0.86***				-0.68***	-0.68***	-0.63**
	(0.21)				(0.24)	(0.25)	(0.28)
Office Rent		-0.0073		-0.012	-0.0092	-0.011	-0.016
		(0.0061)		(0.010)	(0.011)	(0.011)	(0.011)
Home Price		-0.00080		-0.00046	-0.00053	-0.00027	-0.00013
		(0.00057)		(0.00067)	(0.00068)	(0.00069)	(0.00078)
Commute Time			-0.015	0.013	0.017	0.014	0.015
			(0.012)	(0.023)	(0.023)	(0.023)	(0.024)
Firm Size						5.4e-07**	6.6e-07**
						(2.3e-07)	(3.0e-07)
Firm Age						0.0048*	0.0050*
						(0.0026)	(0.0027)
CEO Age							0.0093
							(0.0091)
Female CEO							-0.43***
							(0.17)
Observations	619	566	567	533	531	531	471
Pseudo-R^2	0.020	0.020	0.0018	0.016	0.028	0.040	0.059

Notes: 1) Results of estimating ordered probit regressions of announcement likelihood on controls. The dependent variable takes a value of 3 for In-person, a value of 2 for Hybrid or Flexible or Mixed, and a value of 1 for Remote. Sample consists of Russell 1000 firms that announce a RTO policy from March 1, 2020, to June 1, 2023. 2) Data is from Factiva, Compustat, Dingel and Neiman (2020), Census ACS of 2019, Compstak, Realtor.com, BoardEx, and the Flex Index. All variables are measured as of the end of 2019. 3) All variables defined in Table A.1. 4) t-statistics are calculated based on robust standard errors and are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

In our second alternative specification, we redefine the dependent variable into four categories ordered from most to least stringent: In-person, Hybrid, Flexible, and Remote. (We exclude Mixed given that it is unclear where on the stringency spectrum Mixed policies should lie relative to Hybrid and Flexible). We then reestimate equation 5 using this new definition of the dependent variable and report the results in Table 9. The coefficients on the industry WFH feasibility share are less significant, albeit the same sign, compared to Table 5, and firm size remains positive and significant.

Table 9: Alternative Specification 2: Four Category Dependent Variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
WFH Feasibility Share Above Mean	-0.22**				-0.15	-0.18*	-0.16
	(0.09)				(0.10)	(0.10)	(0.11)
Office Rent Above Mean		-0.17		-0.25	-0.22	-0.25	-0.21
		(0.20)		(0.22)	(0.23)	(0.24)	(0.27)
Home Price Above Mean		-0.03		0.02	0.02	0.07	-0.00
		(0.21)		(0.21)	(0.22)	(0.23)	(0.26)
Commute Time Above Mean			0.02	0.11	0.12	0.12	0.13
			(0.10)	(0.12)	(0.12)	(0.12)	(0.13)
Above Mean Firm Size						0.36***	0.44***
						(0.13)	(0.14)
Above Mean Firm Age						0.09	0.09
						(0.11)	(0.11)
CEO Age Above Mean							0.12
							(0.11)
Female CEO							-0.40**
							(0.16)
Observations	559	511	514	482	480	480	429
Pseudo-R^2	0.0040	0.0034	0.000033	0.0031	0.0049	0.013	0.023

Notes: 1) Results of estimating ordered probit regressions of announcement likelihood on controls. The dependent variable takes a value of 4 for In-person, a value of 3 for Hybrid, a value of 2 for Flexible, and a value of 1 for Remote. Mixed is excluded. Sample consists of Russell 1000 firms that announce a RTO policy from March 1, 2020, to June 1, 2023. 2) Data is from Factiva, Compustat, Dingel and Neiman (2020), Census ACS of 2019, Compstak, Realtor.com, BoardEx, and the Flex Index. All variables are measured as of the end of 2019. 3) All variables defined in Table A.1. 4) t-statistics are calculated based on robust standard errors and are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

5 Stock Market Reactions

In this section we study stock market reaction to RTO policy announcements. For the purpose of the stock return analysis, we restrict our focus to firms that announced their policies during or after the third quarter of 2021, and we exclude Mixed policies, such that our stringency scores mirror those in Table 9.

To obtain a proxy for whether the market would be surprised by a particular announcement (analogous to earnings announcement surprises), we sort firms within 2-digit NAICS industries on announcement date and then compute the rolling average policy stringency score within industry. We then compute, for each firm i, the difference between i's stringency score and the average industry stringency score for i's industry up to the time when i announces. This difference, which we call i's deviation score, is positive (negative) when i's policy is more (less) stringent than its

industry peers who have already announced. For example, consider a firm i, which is the fifth firm in its NAICS industry group j to announce an RTO policy and selects a fully In-person arrangement. Suppose that among the four other firms in industry j, two announced a Hybrid policy and two announced a fully Remote RTO. Then, we calculate the degree of deviation for firm i as:

$$deviationscore_i = 4 - \frac{3+3+1+1}{4} = 2. \tag{5}$$

To study the market's reaction to the relative stringency of the RTO policies chosen by firms, we use two separate benchmarks for returns, and estimate the following regression:

$$Y_{i,[-t,t]} = \beta_1 \times deviation_i + \epsilon_{i,t} \tag{6}$$

where $Y_{i,[-t,t]}$ is either $LogRet_Rm$ or $LogRet_CAPM$ depending on the specification. $LogRet_Rm$ is the log of the excess daily return of stock i over the market rate of return, Rm, cumulated over a 0, 1 or 2-day window surrounding RTO policy announcements. $LogRet_CAPM$ is the CAPM-adjusted logged cumulative abnormal returns of stock i over a 0, 1, or 2-day window surrounding the RTO policy announcements. The 0-day event window measures the abnormal return on the day of the announcement, i.e., from market open the day of the announcement to market close the day of the announcement. The 1-day event window measures abnormal returns cumulated over a three-day period starting from market open on the day before the RTO announcement to market close the day immediately following the announcement. Similarly, the 2-day event window measures abnormal returns cumulated over a five-day period starting from market open two days before the RTO announcement to market close the second day immediately following the announcement.

Our key independent variable of interest, $deviation_i$, is an indicator that can take one of four forms. 1) *Positive Deviation*, which is an indicator variable equal to one when $deviationscore$ is positive, and 0 otherwise; 2) *Large Positive Deviation*, which is an indicator variable equal to one when $deviationscore$ is greater than 1, and 0 otherwise; 3) *Negative Deviation*, which is an indicator variable equal to one when $deviationscore$ is negative, and 0 otherwise; and 4) *Large Negative Deviation*, which is an indicator variable equal to one when $deviationscore$ less than -1, and 0 otherwise.

Tables 10 and 11 report the results. We control for firm size using log of total as-

sets in all specifications. We find no consistent evidence of significant announcement returns for more v.s. less stringent policies. This may indicate that the market does not have a well-formed consensus about the optimal RTO policy.

Table 10: Market Reaction to RTO policy announcements: $LogRet_Rm$

Panel A: Announcement day only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Positive Deviation	0.0022				0.0021			
	(0.0037)				(0.0037)			
Large Positive Deviation		0.0065				0.0068		
		(0.0050)				(0.0053)		
Negative Deviation			-0.0022				-0.0021	
			(0.0037)				(0.0037)	
Large Negative Deviation				0.0023				0.0029
				(0.0054)				(0.0055)
Log assets					0.014	0.014	0.014	0.014
					(0.011)	(0.011)	(0.011)	(0.011)
Observations	158	158	158	158	158	158	158	158
R^2	0.002	0.006	0.002	0.001	0.011	0.016	0.011	0.011
SEs	Robust	Robust	Robust	Robust	Robust	Robust	Robust	Robust

Panel B: [-1,+1] day window

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Positive Deviation	0.0034				0.0030			
	(0.0061)				(0.0061)			
Large Positive Deviation		-0.0028				-0.0021		
		(0.011)				(0.011)		
Negative Deviation			-0.0034				-0.0030	
			(0.0061)				(0.0061)	
Large Negative Deviation				0.0078				0.0091
				(0.0080)				(0.0083)
Log assets					0.030*	0.030*	0.030*	0.031*
					(0.017)	(0.017)	(0.017)	(0.018)
Observations	158	158	158	158	158	158	158	158
R^2	0.002	0.000	0.002	0.005	0.019	0.018	0.019	0.024
SEs	Robust	Robust	Robust	Robust	Robust	Robust	Robust	Robust

Panel C: [-2,+2] day window

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Positive Deviation	0.0028				0.0023			
	(0.0080)				(0.0081)			
Large Positive Deviation		-0.0066				-0.0056		
		(0.015)				(0.014)		
Negative Deviation			-0.0028				-0.0023	
			(0.0080)				(0.0081)	
done Large Negative Deviation				0.013				0.015
				(0.011)				(0.012)
Log assets					0.046**	0.046**	0.046**	0.049**
					(0.023)	(0.022)	(0.023)	(0.023)
Observations	158	158	158	158	158	158	158	158
R^2	0.001	0.002	0.001	0.009	0.026	0.027	0.026	0.037
SEs	Robust	Robust	Robust	Robust	Robust	Robust	Robust	Robust

Notes: 1) This table reports results of linear regressions of market model-adjusted stock returns ($LogRet_Rm$) on announcement deviation measures. 2) Data is from Factiva, CRSP, Kenneth French's data library, and Compustat. 3) All variables defined in Table A.1. 4) t-statistics are calculated based on robust standard errors and are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Table 11: Market Reaction to policy announcements: $LogRet_CAPM$

Panel A: Announcement day only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Positive Deviation	0.0018				0.0017			
	(0.0036)				(0.0036)			
Large Positive Deviation		0.0051				0.0053		
		(0.0048)				(0.0050)		
Negative Deviation			-0.0018				-0.0017	
			(0.0036)				(0.0036)	
Large Negative Deviation				0.0025				0.0029
				(0.0050)				(0.0051)
Log assets					0.0083	0.0089	0.0083	0.0090
					(0.010)	(0.010)	(0.010)	(0.010)
Observations	158	158	158	158	158	158	158	158
R^2	0.001	0.004	0.001	0.001	0.005	0.008	0.005	0.006
SEs	Robust	Robust	Robust	Robust	Robust	Robust	Robust	Robust

Panel B: [-1,+1] day window

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Positive Deviation	0.0025				0.0022			
	(0.0057)				(0.0057)			
Large Positive Deviation		-0.0035				-0.0029		
		(0.011)				(0.011)		
Negative Deviation			-0.0025				-0.0022	
			(0.0057)				(0.0057)	
Large Negative Deviation				0.0090				0.010
				(0.0065)				(0.0066)
Log assets					0.027	0.027	0.027	0.029*
					(0.017)	(0.016)	(0.017)	(0.017)
Observations	158	158	158	158	158	158	158	158
R^2	0.001	0.001	0.001	0.007	0.016	0.016	0.016	0.025
SEs	Robust	Robust	Robust	Robust	Robust	Robust	Robust	Robust

Panel C: [-2,+2] day window

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Positive Deviation	-0.0012				-0.0017			
	(0.0080)				(0.0081)			
Large Positive Deviation		-0.0081				-0.0072		
		(0.015)				(0.015)		
Negative Deviation			0.0012				0.0017	
			(0.0080)				(0.0081)	
Large Negative Deviation				0.022*				0.023*
				(0.012)				(0.012)
Log assets					0.041*	0.040*	0.041*	0.045**
					(0.023)	(0.022)	(0.023)	(0.022)
Observations	158	158	158	158	158	158	158	158
R^2	0.000	0.002	0.000	0.022	0.020	0.022	0.020	0.046
SEs	Robust	Robust	Robust	Robust	Robust	Robust	Robust	Robust

Notes: 1) This table reports results of linear regressions of CAPM abnormal stock returns ($LogRet_CAPM$) on announcement deviation measures. 2) Data is from Factiva, CRSP, Kenneth French's data library, and Compustat. 3) All variables defined in Table A.1. 4) t-statistics are calculated based on robust standard errors and are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

6 Conclusion

We analyze the RTO policies of Russell 1000 firms by hand-collecting a dataset from their announcements. We categorize RTO strategies into five groups ranging from fully in-person to entirely remote. Most firms choose a hybrid model that blends remote and in-office work. There is significant industry and geographic variation, as well as variation across firm characteristics. Consistent with a simple tradeoff model, we show that industry-specific remote work feasibility, office rents, and firm size determine the level of in-person work that firms require. Finally, we find no evidence of significant announcement returns for more v.s. less stringent policies, which may suggest a lack of consensus among market participants about the optimal RTO policy.

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A Appendix

A.1 Data appendix

Table A.1: Variable definitions

Variable	**Definition**
Firm Size	Firm total assets in billions of dollars
Firm Age	Firm age in years as of the end of 2019
WFH Feasibility Share	Pre-pandemic estimate of telecommutable share at the 2-digit NAICS level from Dingel and Neiman (2020)
Commute Time (minutes)	Average one-way commute time in minutes in the headquarter location
Office Rent	Average of the 2019 median quarterly net effective rent per square foot in headquarter MSA in dollars
Home Price	Average of the 2019 median monthly list price per square foot in headquarter MSA in dollars
CEO Age	CEO age in years as of the end of 2019
Female CEO	Indicator equal to 1 if the CEO is female
Positive Deviation	Indicator equal to 1 for firms that announce RTO policies which are more stringent than the average policy adopted by industry peers, and 0 otherwise
Large Positive Deviation	Indicator equal to 1 for firms that announce RTO policies which are more stringent than the average policy adopted by industry peers by at least one category, and 0 otherwise
Negative Deviation	Indicator equal to 1 for firms that announce RTO policies that are less stringent than the average policy adopted by industry peers, and 0 otherwise
Large Negative Deviation	Indicator equal to 1 for firms that announce RTO policies that are less stringent than the average policy adopted by industry peers by at least one category, and 0 otherwise

Variable	**Definition**
LateAnnouncement	Indicator equal to 1 for firms that announced RTO policies during or after the third quarter of 2021, 0 for firms that made announcements before 2021Q3
LogRet_CAPM	Logged cumulative abnormal return (based on CAPM) of stock i over a 0 , 1 and 2-day window surrounding the return to office (RTO) policy announcement
LogRet_Rm	Log of the excess return of stock i over the market return, Rm, cumulated over a 0, 1 and 2-day window surrounding the return to office (RTO) policy announcement
Log assets	Natural log of total assets

A.2 Examples of classifications

A.2.1 Announcement categories

As an example of a firm that announces an In-person policy, take Ally Financial, which announced on September 3, 2022, the following:

> *Ally Financial encouraged employees to return to its offices in recent months.* Like many companies, it found that some employees stayed home anyway, said Kathie Patterson, the financial-services company's HR chief. Ally has hired close to 2,000 people during the pandemic, Ms. Patterson said, and new employees need to learn alongside company veterans. *The company sent a message to staff in recent weeks to remind employees that office attendance is expected, and leaders are telling staff to reiterate that point.* "There is a real strong push now, after Labor Day, for all employees to come back into the workplace," she said. "We want a more consistent schedule." For those workers who have spent little to no time in the office, managers are reaching out to have individual conversations, Ms. Patterson said, and may give staffers a deadline to make personal arrangements to return. Further action could take place in the year ahead. "We're prepared to have a very clear conversation that this position is in-office," she said. *"If they're not in the office, it could be seen as a form of insubordination*, but we have not gotten to that point yet."

As an example of a firm that announces a Hybrid policy, take Wells Fargo, which announced on July 16, 2021, the following:

> Wells Fargo has laid out a return-to-work strategy that includes a first wave of remote employees coming into the office after Labor Day and others heading back sometime in October...In the banking industry, where most non-branch employees shifted to remote work in March 2020, return-to-work strategies are creating a divide, as some companies demand that their employees come back on a full-time basis while others take a less strict approach. Now, Wells Fargo's back-to-office plans will be organized by job function and location, and flexibility will vary, the company said. But the details on such flexibility are still fuzzy. *Technology, corporate and*

> *back-office employees of the $1.9 trillion-asset bank will return in October, according to the memo. They will be offered at least some degree of flexibility in terms of how many days they spend in the office and how many days they work from home. For technology teams, Wells "will allow more flexibility to work remotely," while corporate and back-office staffers may have the option of splitting their weeks between office and home, spending at least three days a week in the office, the company said. What flexibility looks like for call center teams is not yet clear. Wells said management is trying to figure out "how to best offer flexibility for contact center and operations roles going forward" and that the ability to work remotely will depend on factors such as the type of job and individual employees' experience.*

As the article indicates, most workers will split time between in-person and remote work.

As an example of a firm that announces a Flexible policy, take Charles Schwab Corp, which announced on August 19, 2021, the following:

> The firm also announced additional steps it is taking to address pandemic concerns and provide workplace flexibility for its employees going forward. In light of current circumstances, the firm has delayed a full Return to Office until January 2022, at the earliest. In the meantime, employees can continue to work from home, or return to the office on a voluntary basis. Once back in the office, Schwab employees will enjoy additional workplace flexibility, based on a hybrid work schedule. *Employees will also have the ability to work with their manager to determine an approach that works for their individual situation, should they need additional flexibility.*

The key distinguishing factor between Charles Schwab and Wells Fargo is that Schwab will give employees the ability work with their manager to determine the appropriate RTO policy, which implies that the RTO arrangement is not a blanket, company-wide policy. In contrast, Wells Fargo's announcement implies that all employees across the company will work in-person part of the time and remote part of the time, which implies a firm-wide Hybrid policy. This example illustrates the key difference between a Flexible and Hybrid policy. A Hybrid policy applies at the firm-wide level and the choice of RTO policy is not at the discretion of lower-level managers or supervisors. In contrast, under a Flexible policy, the choice of policy *is*

at the discretion of team or group managers.

As an example of a firm that announces a Remote policy, take Brighthouse Financial, which announced on January 10, 2022, the following:

Throughout the COVID-19 pandemic, the health and safety of our employees and their families has been a top priority. At the end of 2021, all Brighthouse Financial offices remained closed as we closely monitored the current environment. *This spring, we plan to begin transitioning to a flexible, hybrid work model that allows our employees to choose whether they want to work fully remotely or use our offices.* While we hope that the worst of the pandemic is behind all of us, other headwinds, including geopolitical and macroeconomic ones, have emerged more recently. In this challenging environment, Brighthouse Financial remains dedicated to our mission to help people achieve financial security. Uncertain times further underscore the importance of protecting individuals' and families' financial futures, and we at Brighthouse Financial are proud to be one of the largest providers of annuities and life insurance in the U.S. 1 It is that sense of pride and purpose that drives us every day to deliver on our mission while living our company's core values of collaboration, adaptability and passion.

Although the text of the announcement mentions a "flexible, hybrid model," because employees are allowed to "choose whether they want to work fully remotely or use our offices," all employees can work fully remotely if they choose. Therefore, this qualifies as a Remote policy.

Finally, as an example of a firm that announces a Mixed policy, take KeyCorp, which announced on July 20, 2021, the following:

> At Key, the resurgence of the coronavirus hasn't impacted our back-to-the-office strategies, but it could if it continues. *By the end of September, we expect to have our whole team back in the office. We have 17,000 teammates nationwide. Half will work four to five days in the office. Another 30% will work three days in the office on a "reservations" basis, and 20% will work remotely from home.* In the Cleveland market, that means about 1,000 of our associates in our downtown Cleveland headquarters and other Northeast Ohio offices will continue to work remotely.

This example illustrates the key distinguishing factor between Mixed and Hybrid

or Flexible: that different policies apply to different groups of employees. Unlike Flexible, a Mixed policy is determined at the company level and the policy decision is not made by lower-level managers or team supervisors. However, a Mixed policy does not imply that all employees work part-time in office and part-time remotely. Rather, it implies that certain types of employee will be subject to certain RTO policies, whereas other types of employees are subject to different policies.

A.2.2 Non-announcer

As an example of a non-announcer, take the firm ResMed Inc, which manufactures medical devices. On August 12, 2022, the following article about ResMed was published:

> As the COVID-19 pandemic spread, we implemented and maintained significant changes that we determined were in the best interest of our employees. These included work from home flexibility, adjusted attendance policies and additional safety measures for our on-site workforce. We have since re-opened our offices, consistent with local public health guidance and protocols, and continue to support flexible working globally.

Although this article contains the phrases "flexible working" and "flexibility," it is not classified as Flexible because it does not specify that employees and managers have discretion to negotiate individual RTO policies. Additionally, it does not indicate any type of firm-wide or Mixed policy. Therefore, we classify it as a non-announcement.

A.2.3 Multiple announcements

As an example of a multiple announcer, take the firm Hewlett-Packard Company. The first announcement we observe is on August 26, 2021, in which they announce a Hybrid policy:

> Let me now turn to our transformation efforts and our cost savings initiatives. In the second year of our program, we continue to look at new cost savings opportunities and remain ahead of our $1.2 billion gross run rate structural cost reduction plan. Our hybrid work strategy is one example. It has enabled us to accelerate our location strategy while providing a

> more flexible workspace. Going forward, we are enabling HP's hybrid work strategy by monetizing our sites to be critical hubs for collaboration and innovation. This will also deliver savings in our real estate portfolio.

HP then made a subsequent announcement on December 9, 2021, which was consistent with the Hybrid policy announced initially.

> We are embracing hybrid ways of working across HP and introduced new flexible working guidelines in July 2021. Hybrid Work at HP balances more workplace flexibility with structured time together to collaborate and connect in person at our HP sites. Our goal is to provide the ability to work seamlessly across a diverse ecosystem of workplaces, enabled by enhanced tools and technology designed to optimize productivity and collaboration.