

# Digital transformation of work: Swiss MSEs working from home behaviour during COVID-19 – pioneers leading the pack

Digital  
transformation  
of work

249

Marc K. Peter

*School of Business, FHNW University of Applied Sciences and Arts Northwestern  
Switzerland, Olten, Switzerland and School of Business, Charles Sturt University,  
Bathurst, Australia, and*

Lucia Wuersch, Alfred Wong and Alain Neher

*School of Business, Charles Sturt University, Bathurst, Australia*

Received 11 January 2023  
Revised 30 April 2023  
26 July 2023  
Accepted 22 August 2023

## Abstract

**Purpose** – The purpose of this study is to better understand technology adoption and working from home (WFH) behaviour of micro and small enterprises (MSE) with 4 to 49 employees during the first (2020) and second (2021) COVID-19 lockdowns in Switzerland.

**Design/methodology/approach** – This study uses two data sets gathered using computer-assisted telephone interviewing surveys conducted with 503 managing directors of Swiss MSEs after the first and 506 MDs after the second COVID-19 lockdown period.

**Findings** – The study revealed that during the COVID-19 pandemic, WFH arrangements are related to the adoption of technology by Swiss industry groups. Furthermore, industry characteristics and technology adoption strategies are also associated with the long-term prospect of WFH. The overall result confirms the predominant role of technology pioneers.

**Research limitations/implications** – The study focuses on MSEs in Switzerland during a specific period. The data set includes mainly quantitative data. Future studies could investigate larger enterprises in international contexts, integrating employees' viewpoints founded on long-term gathered qualitative data. The implications of this study include predictions about future WFH behaviour in Swiss MSEs.

**Originality/value** – To the best of the authors' knowledge, this is the first study collecting data in Swiss MSEs after the two COVID-19 lockdowns in 2020 and 2021. As a result, this study offers a unique perspective on a specific business segment, which accounts for around 70% of global employment.

**Keywords** Micro and small enterprises, MSE, Digital transformation, Technology adoption, Working from home, WFH, Home office, Remote work, COVID-19

**Paper type** Research paper

© Marc K. Peter, Lucia Wuersch, Alfred Wong and Alain Neher. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licences/by/4.0/legalcode>

*Funding of study:* The authors acknowledge Die Mobiliar (mobiliar.ch), Digitalswitzerland (digitalswitzerland.com) and SATW (satw.ch) for providing financial support to conduct the field research.



## 1. Introduction

Working from home (WFH) and how people use technology in home office settings have attracted increasing attention during the COVID-19 pandemic (Battisti *et al.*, 2022; Nagel, 2020; Reuschl *et al.*, 2022). Previous studies suggest that WFH generally depends on the technology adoption of enterprises (Kaličanin, 2008) and the industry in which they operate (Etheridge *et al.*, 2020; Felstead and Reuschke, 2020). Recent research (Reuschl *et al.*, 2022) investigated the digital transformation (DT) of large organisations during the COVID-19 pandemic. Our research interest, however, focuses on micro (less than 10 employees) and small (10 to 49 employees) enterprises (MSEs) as they represent the greatest number of businesses in Switzerland and globally, hence, substantially contribute to the economy [Federal Statistical Office (FSO), 2020a; International Labour Organization (ILO), 2022]. Specifically, MSEs, including the self-employed, account for around 70% of global employment (International Labour Organization [International Labour Organization (ILO), 2022]. In Switzerland, the MSE sector comprises 98.2% of all companies [Federal Statistical Office (FSO), 2020a]. The COVID-19 outbreak has increased the number of people working in digital settings (Nagel, 2020), and “digitalisation calls for new ways of workplace communication and collaboration. . .” (Kraus *et al.*, 2022, p. 2). While cross-sectorial evidence on DT of work is available from periodically administered household surveys (Etheridge *et al.*, 2020; Felstead and Reuschke, 2020), how the pandemic impacted the DT of work in MSEs has received little scholarly recognition (Kimuli *et al.*, 2021). Instead, SMEs have gained some attention (Papadopoulos *et al.*, 2020). However, it is unclear how during and after COVID-19 lockdowns MSEs adopted digital technologies, were affected by WFH behaviour across industry groups, and how their managing directors (MDs) viewed WFH behaviours in the long term.

Based on this research gap, our study analyses MSEs’ WFH behaviours during the first (2020) and second (2021) COVID-19 lockdowns in Switzerland. The study focuses on the MSEs’ DT and aims to better understand how they reacted to the government-induced COVID-19 lockdowns and regulations in terms of WFH and the DT of work. In particular, our investigation seeks to improve the understanding of WFH behaviours linked to the technology adoption and distinct industry groups, including a long-term perspective. MDs’ long-time perspective may allow for developing approaches that help MSEs in their strategic decision-making regarding technology investment and technology adoption (Zhani *et al.*, 2021) to be more competitive in the digital age. While MSEs include firms with 1 to 49 employees, our study excluded firms with less than four employees. Micro-enterprises with minimal staff tend to have small budgets and limited resources and be preoccupied with daily business rather than paying attention to DT and developing innovation strategies (Bai *et al.*, 2021; Faherty and Stephens, 2016; Singh and Kumar, 2020).

Our paper contributes to the knowledge of remote work and the DT of Swiss MSEs using a high-quality and unique dataset of two surveys participated by 503 MDs after the first and 506 MDs after the second COVID-19 lockdown period. Our research also contributes to the strategic intent of MSEs’ MDs regarding technological investments and new work. This first single-country study can be extended to a larger geographical context. The results show that IT-intensive industry groups are more likely to offer WFH arrangements, which is frequently enhanced by the degree of technology adoption. In the long-term, MSE MDs see WFH as a suitable alternative to conventional work settings, provided operational circumstances allow for it. In practice, and as highlighted by Teece (2018), strategic decision-making in MSE technology investments

concerning WFH behaviours is crucial. Despite industry-specific differences, a consistent strategy for working remotely is recommended.

We first outline relevant literature leading to three hypotheses. Next, the research design specifies the sample, data collection and analysis method. We then comment on the results before discussing contributions, recommendations and how limitations may lead to further research.

## 2. Theoretical background and hypotheses

### 2.1 Working from home behaviour and digital transformation before and during COVID-19

How people work in WFH settings relates to the DT of their organisation, as digital technologies influence how people communicate and work together (Peter *et al.*, 2020). DT can be conceptualised as a multidimensional and technology-driven phenomenon and the sum of changes generated using digital technologies affecting economics, politics, and society (Schallmo and Williams, 2018). DT can also be described as combining information, computing, communication and connection technologies, generating significant changes (Vial, 2019; Wuersch *et al.*, 2022). Economically, DT is understood as using information and communication technologies (ICT) to achieve increased economic value (Reddy and Reinartz, 2017). As such, digital applications allow location-independent online collaborations and communication between employees and managers, enabling WFH (Omrani *et al.*, 2022; Panteli *et al.*, 2022). However, the DT of work exceeds the digital evolution of technologies in the workplace and constitutes a strategic initiative transforming organisations and how people work together (Schallmo and Williams, 2018). Strategically, adopting digital initiatives influences business models and processes, and people's interactions in everyday life to create wealth (Pilkington, 2017). Battisti *et al.* (2022) confirm this phenomenon as under-researched, especially the link between digital technology and remote working; and Dabić *et al.* (2023, p. 2) outline the “[. . .]inordinate challenges in managing the transition to the digitalisation of work [and] to assess how digital technologies affect the nature of work”.

For over half a century and influenced by technological and social developments, telework became what today is known as WFH (López-Igual and Rodríguez-Modroño, 2020). WFH can be defined as “all types of work-related activities away from the employer's premises that are supported by ICT” (Messenger, 2019, p. 4). Three generations of WFH include, first, the “home office” during the 1970s and 1980s as cheap, ecological and stationary workplaces located near the employees' homes and in remote areas. The second generation, the “mobile office”, was about smaller and lighter devices, such as laptops and mobile phones, which enabled separating place and work so that work could be completed “here, there, anywhere and anytime” (Kurkland and Bailey, 1999, p. 53). The last generation of “new ICT” was enabled by networks and the cloud to store information, leading to “virtual offices” allowing employees to work outside the employer's premises (Messenger, 2019). With DT, technological infrastructure (among others) is required to provide (virtual) offices and internet connectivity (Omrani *et al.*, 2022), enabling future work settings, including WFH.

Switzerland has a longstanding tradition of WFH. In the 18th century, families in the countryside produced flax yarn and linen cloth for master weavers in the cities (Tanner, 2015). Nowadays, ICT are a decisive factor that influences the development and performance of telework, such as working remotely from the main site of

operations. COVID-19 fast-tracked the DT of organisations and increased WFH (Nagel, 2020). The pandemic and subsequent lockdowns often led to work relocation from employers' premises to employees' home offices. During the two lockdowns in Switzerland, the government decreed WFH to reduce COVID-19 infections by encouraging telework, online trade and digital communication. This sudden change to WFH was made possible by existing digital working environments. COVID-19 accelerated the DT of work significantly, depending on the firms' technology adoption and industry groups.

### *2.2 Swiss micro and small enterprises' working from home behaviours related to technology adoption during COVID-19*

The degree of DT of work varies with an organisation's technology adoption. It uses a typology that classifies certain organisations as digital (or technological) "pioneers" if they are consistently "trying to make a competitive advantage through being first in a new field" (Kaličanin, 2008, p. 91). The pioneer position is generally considered a good strategic option in innovation studies (Lieberman and Montgomery, 1988, 1998; Pantano *et al.*, 2022). Being first can have the advantage of developing superior technological innovations, which are hard to copy by competitors; gaining a positive image and reputation as a technological pioneer; and retaining current customers or attracting new ones (Pantano *et al.*, 2022). The drawbacks, however, include high initial costs and uncertain technologies and markets (Lieberman and Montgomery, 1988, 1998).

Other organisations, which start adopting new technologies as soon as they know the experiences of others, can be categorised as "early followers". In contrast to pioneers, "early followers" save on innovation costs and capitalise on the pioneers' mistakes. However, they have to compete against the pioneers' first-mover advantage (FMA) (Pantano *et al.*, 2022). Finally, the last group of "late adopters" (or late followers) only implement new technologies when essential (Mancha and Shankaranarayanan, 2020) and thus have a "wait-and-see attitude until the best solution emerge[s] in the market" (Park, 2020, p. 1757). In the high-tech market, the three categories follow the logic of the entry order and are "product leader, fast follower and late follower" (p. 1757), using generally used definitions (Lieberman and Montgomery, 1988; Shamsie *et al.*, 2004). In the field of DT of organisations, the three categories apply to both "born digital" (e.g. Amazon, Uber, Airbnb) and "pre-digital" companies (Chanas *et al.*, 2019), and whether an organisation is a pioneer or a follower is a strategic decision (Kaličanin, 2008).

Being a pioneer or an early follower of ICT was an advantage when COVID-19 impacted society and businesses, and WFH suddenly became mandatory as business operations, processes, and organisational structures were already in place. This FMA allowed technologically advanced enterprises to achieve increased economic value (Kretschmer and Khashabi, 2020). Organisations ideally have a holistic digital internal communication strategy; hence, employees are digitally skilled and keen to collaborate with others using digital platforms and virtual spaces, and enterprises have embedded a digital culture (Wuersch *et al.*, 2020, 2022). Digital or technological pioneers are agile in adapting WFH or even work-from-everywhere (WFX) settings (Smite *et al.*, 2021, 2023).

The effects of COVID-19 on the DT of work within MSEs have attracted little scholarly attention (Battisti *et al.*, 2022; Dabić *et al.*, 2023; Kimuli *et al.*, 2021). In particular, it is unknown how MSEs in Switzerland have adopted digital technologies during and after the two COVID-19 lockdowns, especially as technology adoption is both linked to WFH (Battisti

*et al.*, 2022; Dabić *et al.*, 2023; Kimuli *et al.*, 2021; Kraus *et al.*, 2022; Kretschmer and Khashabi, 2020; Omrani *et al.*, 2022; Smite *et al.*, 2021, 2023) and DT (Kalićanin, 2008; Lieberman and Montgomery, 1988, 1998; Park, 2020; Peter *et al.*, 2020; Vial, 2019; Wuersch *et al.*, 2022; Zhani *et al.*, 2021). Therefore, *H1* tests the association between WFH behaviours and technology adoption during the first and second lockdowns:

*H1.* WFH arrangements are related to technology adoption that reflects the degree of DT embraced by Swiss MSEs.

### *2.3 Working from home behaviours of Swiss micro and small enterprises during COVID-19 according to industry groups*

The ability to WFH or WFX generally depends on a firm's industry affiliation. Similarly, before COVID-19, between 2001 and 2019, WFH behaviours varied in Switzerland depending on the industry. For example, in 2017, 52.7% (2018: 55.3%; 2019: 58.4%) of all employees in the ICT and marketing industry worked either part-time or full-time from home. On the other hand, the percentages of employees WFH were different per industry with generally little variation over the years; for example, in the Production and Manufacturing industry 17.6% (2018: 18.3%; 2019: 18.2%) or in Health and Social services 13.4% (2018: 14.3%; 2019: 14.5) [Federal Statistical Office (FSO), 2020b].

During the COVID-19 pandemic, the WFH percentages raised significantly per industry. Specifically, workers in industries and occupations characterised as suitable for WFH saw massive rises in the prevalence of WFH, showed a higher proportion of WFH, and higher productivity (Etheridge *et al.*, 2020; Felstead and Reuschke, 2020). For example, in their report on UK data, Etheridge *et al.* (2020) found the "Information and Communication" industry had the highest degree of WFH before and during the first lockdown. Similarly, Adams-Prassl *et al.*'s (2020) study across the UK and USA reported that the "Information and Communication" industry had the highest ability to WFH. The situation was similar in Switzerland, where in 2020, of all employees in the ICT and Marketing industry, 76.35% (2021: 86.4%) engaged in a WFH arrangement [Federal Statistical Office (FSO), 2020b].

While there are statistics illustrating the situation per industry of all employees in Switzerland [Federal Statistical Office (FSO), 2020b], no scholarly investigation into the WFH behaviours of Swiss MSEs during and after the pandemic could be found. Achieving a better understanding of the WFH behaviours of this resource-constrained economic segment is important as small enterprises can gain a competitive advantage, particularly when using a resource-based model towards innovation (Maiti *et al.*, 2020). Furthermore, MSEs have encountered particular challenges due to sudden changes to business operations caused by COVID-19 (Cotterell and Bowen, 2021). To conclude, the degree to which WFH is practised depends on industry group association [Adams-Prassl *et al.*, 2020; Etheridge *et al.*, 2020; Felstead and Reuschke, 2020; Federal Statistical Office (FSO), 2020b]; and at the same time, ICT are an important enabler of value creation and service delivery (Kalićanin, 2008; Omrani *et al.*, 2022; Pantano *et al.*, 2022; Peter *et al.*, 2020; Zhani *et al.*, 2021). Therefore, *H2* tests the association between the proportions of employees WFH in Swiss MSEs and industry groups:

*H2.* WFH arrangements are related to industry groups, which reflect the degree of reliance on ICT in their service delivery to Swiss consumers.



#### *2.4 Long-term predictions of working from home behaviours of Swiss micro and small enterprises after the two lockdowns*

DT of organisations involves “without doubt, institutional change” (Hinings *et al.*, 2018, p. 55) and impacts employee roles, leadership and organisational culture (Wuersch *et al.*, 2022). It can be argued that digital workplaces (DWP) may be maintained in the future because of their benefits, such as increased innovation and productivity and improved corporate operational efficiency and performance (Peter *et al.*, 2020). Indeed, during the last two decades, 2001–2019, there has been a general upward trend in the WFH behaviour of employees in Switzerland [Federal Statistical Office (FSO), 2020b]. This trend was boosted in 2020 and 2021 with a significant increase in WFH due to COVID-19 government restrictions. After the restrictions were lifted, some employees returned to their workplace at the employers’ premises while others fully or partly maintained their WFH arrangement.

The literature offers some predictions of how WFH behaviour may develop in the long term. Focusing on how technology adoption groups behave in the market, it is suggested that pioneers can benefit from FMA by using economies of scale, controlling scarce resources and developing market knowledge. Thus, pioneers have a competitive advantage over later market entrants and can persist for a long time (Suarez and Lanzolla, 2007). In addition, firms using ICT and related processes improved operational and financial performance (Barua *et al.*, 2004). Hence, pioneers with DWP are likely to maintain WFH and its associated advantages.

In contrast, the situation with industry groups may differ. While some industries, such as banks, may accelerate their DT processes and become increasingly digital, the number of employees WFH may remain the same for other industry groups, such as Commerce and Sales, where face-to-face client contact may remain important in the future (Diener and Špaček, 2021). It is unclear how Swiss MSEs’ WFH behaviours may develop in the long term. Such a long-term prospect would benefit other related industries, including public transport, energy and housing.

Besides the benefits of WFH, the drawbacks should also be considered moving forward. For example, social and professional isolation may lead to reduced interpersonal networking, less informal learning, and a lack of visibility, resulting in fear of limited opportunities for promotion, rewards and performance feedback (van der Lippe and Lippényi, 2020). Such drawbacks may vary across industries and MSEs’ organisational cultures. Therefore, the manager’s role is crucial in the firm’s long-term evolution (Ofori-Amanfo *et al.*, 2022) and requires a transformational leadership style (Ofori-Amanfo *et al.*, 2022; Kafetzopoulos and Gotzamani, 2022), especially as innovation is the variable that correlates technology orientation (adoption) with performance (Zhani *et al.*, 2021), and might vary depending on industry group association [e.g. Adams-Prassl *et al.*, 2020; Etheridge *et al.*, 2020; Felstead and Reuschke, 2020; Federal Statistical Office (FSO), 2020b]. Therefore, H3 tests MSE MDs’ long-term prospects of WFH related to technology adoption and industry groups:

*H3. Long-term WFH arrangements are related to technology adoption and industry groups of the Swiss MSEs.*

Surveying 1,009 MDs in various industries and technology adoption groups across Switzerland’s German, French and Italian language regions allowed for testing of our hypotheses.

### **3. Research design**

Two surveys conducted in 2020 and 2021 provided insights into the state of home office and technology use in MSEs, driven by COVID-19. In contrast to the work of Kraft *et al.*, 2022 that collected survey data in 2017, our paper focuses on the 2020 and 2021 sample periods to

provide a suitable context for our study on the WFH arrangements during the pandemic. Both surveys were conducted with MSE MDs using the computer-assisted telephone interviewing) method. CATI is a well-established survey approach suitable for large volumes of telephone/mobile phone interviews (Kim and Couper, 2020). Interviews use a predefined questionnaire supported by software applications. Accuracy-enhancing built-in logic skips questions that do not apply or looks for further details, if required. Appendix 1 illustrates a selection of questions used in the CATI survey; and Appendix 2 provides an overview of the questions as per Appendix A relating to the hypotheses.

The initial CATI survey was carried out between 19 August and 7 October 2020, during the first two pandemic waves, after the Swiss Federal Council’s first home office recommendation was lifted on 22 June 2020. The second CATI survey was conducted between 16 June and 27 July 2021, shortly before a new governmental home office recommendation came into force. Both surveys were designed similarly.

The sample of the first wave (2020) included 503 MSE MDs. The population comprised around 153,000 firms with 4 to 49 employees across Switzerland [Federal Statistical Office (FSO), 2019]. The confidence interval of the overall sample was  $\pm 4.5\%$  with a certainty of 95% (50/50 distribution). The random sample reflected a structurally identical picture of the population and was proportionate to company size categories (Table 1). Hence, the results can be extrapolated to the total population, considering the confidence interval. The distribution of the MSE size categories (number of employees) was ensured using quota control; the distribution by major region was achieved through pre-address stratification. The sample of the second wave (2021) included 506 MSE MDs and was carried out in the same way as the first study. The confidence interval of the total sample was  $\pm 4.4\%$  with a certainty of 95% (50/50 distribution). The response rate was 3.4% for the first and 3.6% for the second survey.

Table 1 shows the actual distribution of the examined firm size categories in Switzerland (second column) and the proportional distribution of the survey participants per survey (third and fourth columns).

A further breakdown of the data in Table 2 summarises the first and the second wave survey respondents by language region. The actual distribution of the main Swiss

Business size	Actual distribution (%) (FSO, 2019)	Proportional sample (%) 2020 (n = 503)	Proportional sample (%) 2021 (n = 506)
4–9 employees	66	330 (66)	326 (64)
10–19 employees	22	110 (22)	114 (23)
20–49 employees	12	63 (12)	66 (13)
Total	100	100	100

Source: Table by authors

**Table 1.** Distribution of survey participants and distribution of MSEs in Switzerland

Language region	Actual distribution (%) (FSO, 2023)	N	Column (%)
Swiss French	24.6	256	25.4
Swiss German	66.9	683	67.7
Swiss Italian	8.5	70	6.9
Total	100	1,009	100.0

Source: Table by authors

**Table 2.** Distribution of survey respondents by three main Swiss languages

languages [[Federal Statistical Office \(FSO\), 2023](#)] shown in the second column corresponds closely to the distribution of the aggregated surveys presented in column four.

The surveys considered standard ethical requirements such as confidentiality to the participants and the possibility of exiting the interview process at any point. Participation in the survey was voluntary, and participants were not given any incentives.

After completing the data collection process, the raw data sets of both surveys were combined, resulting in a total of 1,009 records. The participating businesses were categorised according to their size, language region and industry. Variables coded in German, French or Italian were translated into English and imported into IBM SPSS Statistics (version 27). Data cleaning was carried out to exclude missing values. To examine data distributions, we used boxplots; observations three times more than the interquartile range of the data set were considered outliers and excluded.

From the MSEs samples emerged 16 industry groups, determined according to their respective economic activities following the current General Classification of Economic Activities (NOGA) of the Federal Statistical Office of Switzerland [[Federal Statistical Office \(FSO\), 2008](#)]. Using similar logic, the 16 industry groups were further aggregated according to their similarity in the production process and delivery of goods and services. As a result, the 16 groups were reclassified into five key industry groups (see [Appendix 3](#) for constituents of the five groups) to obtain adequate subsample sizes for statistical analyses. Among these five industry groups, we highlight the “Construction and Manufacturing” group, which may appear somewhat peculiar in the context of WFH, especially the construction component. Indeed, the technical aspect of the construction industry presents a significant challenge for implementing the WFH arrangements over the pandemic period. However, this does not negate the possibility of some employees adopting the WFH arrangements, which may include digital off-site activities such as conducting online meetings, writing emails, using digital tools (e.g. 3D modelling) and applying other digital technologies ([Leontie et al., 2022](#)).

Finally, the application of statistical procedures resulted in the following tables.

## 4. Results

We initially compared means for the WFH ratios (WFHR) calculated as the number of employees who WFH during the lockdowns, divided by the total number of employees (full-time and part-time) reported for the MSEs. The WFHRs were categorised by technology adoption, industry groups and the MDs’ long-term prospects of WFH arrangements, using the two-tailed independent sample *t*-test and summarised by the survey year. Our preliminary analysis suggested a low degree of positive skewness in the data set. Accordingly, the bootstrap procedure was used to provide robust estimates of standard errors for the *t*-tests ([Rousselet et al., 2021](#)). We further conducted tests of associations on the proportions grouped by industries, technology groups and sample periods.

### 4.1 H1 results

First ([Table 3](#)), we examined the possible association between adopting WFH arrangements and the technology group, defined by three distinct subgroups: pioneers, early followers and late followers. We created a new grouping variable, which assigns a value of one for MSEs with four or more employees who opted for WFH arrangements (“WFH > 0”) and zero otherwise (“WFH = 0”). Using this grouping procedure, Panel A suggests that 72.1% (= 468/649) of employees in the whole sample worked from home over the two survey periods. As expected, the pioneers group has the largest proportion of employees who



**Table 3.** Employees' WFH behaviour by technology group

Technology group	n	WFH arrangements		
		WFH > 0 Col (%)	WFH = 0 Col (%)	
<i>Panel A: Technology group, whole sample (n = 649)</i>				
Pioneers	126	26.9*	25	13.8
Early followers	226	48.3	80	44.2
Late followers	116	24.8	76	42.0*
Total	468	100.0	181	100.0
Chi-Sq test stat. = 23.16*, df = 2				
<i>Panel B: Technology group, by year</i>				
<i>Yr. 2020 (n = 329)</i>				
Pioneers	55	23.8*	13	13.3
Early followers	122	52.8	41	41.8
Late followers	54	23.4	44	44.9*
Total	231	100.0	98	100.0
Chi-Sq test stat. = 16.07*, df = 2				
<i>Yr. 2021 (n = 320)</i>				
Pioneers	71	30.0*	12	14.5
Early followers	104	43.9	39	47.0
Late followers	62	26.1	32	38.5*
Total	237	100.0	83	100.0
Chi-Sq test stat. = 9.04*, df = 2				

**Notes:** “\*” on the far-left column denotes the Pearson Chi-Square Test statistics that can be rejected at the 5% level of statistical significance. “\*” in the column proportion (“Col (%)”) denotes the difference in proportions of the same technology group that is statistically significant at the 5% level

**Source:** Table by authors

worked from home (83.4% = 126/(126 + 25)), followed by early followers (73.9% = 226/(226 + 80)) and late followers (60.4% = 116/(116 + 76)).

The Pearson Chi-squared test statistic is used to determine if there is an association between the row (technology group) and column (WFH arrangements) variables. The results based on the whole sample in Panel A have a chi-squared statistic of 23.16 (df = 2, 2-tailed), and thus, the null hypothesis of independence can be rejected at the 5% level. This provides evidence of a strong association between WFH arrangements and the technology group. As shown in Panel B, a similar conclusion can be drawn for the 2020 and 2021 subsamples.

In Column 2 of Panel A, the column percentages indicate that out of 468 MSEs that report WFH > 0, 26.9% are categorised as pioneers, while 48.3% and 24.8% are early and late followers, respectively. A comparison of the WFH > 0 and WFH = 0 proportions was conducted using a z-test. Notably, for the pioneers, the proportion of employees who adopted WFH arrangements is significantly higher than those who did not WFH (p-value < 0.05). Conversely, late followers show a significantly higher proportion of employees who did not WFH (42%). For this group, the test statistic for a difference in the proportions (WFH > 0 and WFH = 0) is statistically significant at the 5% level (marked with “\*”). When the test was repeated by survey periods in Panel B, we found a similar pattern; thus, the findings in Panel A are robust across the survey periods. The overall result suggests a statistically significant relationship between the variables “WFH arrangements” and “technology group” in the data sets. Hence, the main result from Table 3 supports the first hypothesis that suggests WFH arrangements are related to technology adoption.

4.2 H2 results

Next (Table 4), we performed the same tests as before, but this time with the industry group, allowing investigation into the association between WFH arrangements and industry groups.

For the test of association, the Pearson Chi-squared test statistics range from 10.86 to 28.45 in both Panels, thus providing evidence that the null hypothesis of no association between WFH arrangements and the industry group can be rejected at the 5% level of statistical significance. The results for the whole sample in Panel A suggest the IT and Media industry comprises 17.1% of the sample, with one or more employees WFH. This result contrasts with the corresponding proportion of 3.9% of employees who did not WFH. The test for a difference in these proportions has a  $p < 0.05$ , suggesting evidence of a significant difference in these proportions. For industries represented by Commerce and Sales and Construction and Manufacturing, significantly larger proportions of employees who did not WFH are reported compared with the proportions of employees who worked from home. However, for Financials and Services and Health and Education, there is no evidence of a significant difference in proportions for  $WFH > 0$  and  $WFH = 0$  in the whole sample.

Analyses by sample periods in Panel B suggest the IT and Media industry results remain largely unchanged, showing evidence of significantly larger proportions of employees who

Industry group	n	WFH arrangements		
		WFH > 0 Col (%)	WFH = 0 Col (%)	
<i>Panel A: Industry group, whole sample (n = 642)</i>				
Commerce and Sales	75	16.2	47	26.3*
Construction and Manufacturing	140	30.2	70	39.1 *
Financials and Services	140	30.2	43	24.0
Health and Education	29	6.3	12	6.7
IT and Media	79	17.1*	7	3.9
Total	463	100.0	179	100.0
Chi-Sq test stat. = 28.45*, df = 4				
<i>Panel B: Industry group, by year</i>				
<i>Yr. 2020 (n = 331)</i>				
Commerce and Sales	38	16.3	30	30.6 *
Construction and Manufacturing	75	32.2	38	38.8
Financials and Services	72	30.9*	19	19.4
Health and Education	15	6.4	9	9.2
IT and Media	33	14.2*	2	2.0
Total	233	100.0	98	100.0
Chi-Sq test stat. = 21.38*, df = 4				
<i>Yr. 2021 (n = 311)</i>				
Commerce and Sales	37	16.1	17	21.0
Construction and Manufacturing	65	28.3	32	39.4
Financials and Services	68	29.6	24	29.7
Health and Education	14	6.0	3	3.7
IT and Media	46	20.0*	5	6.2
Total	230	100.0	81	100.0
Chi-Sq test stat. = 10.86*, df = 4				

**Table 4.**  
Employees WFH  
behaviour by  
industry group

**Notes:** "\*" on the far-left column denotes the Pearson Chi-Square Test statistics that can be rejected at the 5% level of statistical significance. "\*" in the column proportion ("Col (%)") denotes the difference in proportions of the same industry group that is statistically significant at the 5% level

**Source:** Table by authors

worked from home in both sample periods. Although the Financials and Services industry shows evidence of a significantly larger proportion of employees opting for WFH, such evidence only exists for the 2020 sample period. The results in Table 4 support the second hypothesis that WFH arrangements are related to industry groups over the pandemic period.

4.3 H3 results

Finally (Tables 5 and 6), we considered the “long-term WFH” variable examining the association between technology and industry groups and how they may differ in the proportions of employees adopting WFH arrangements. Tests of association and differences in proportions were conducted using the whole sample and by survey periods. Panels A and B (Table 5) are the results for the technology group, while Panels C and D (Table 6) summarise the results by industries.

The results presented in Panels A and B (Table 5) suggest an association between long-term WFH and technology group, evidenced by high Pearson Chi-squared test statistics, which are significant at the 5% level. There is also evidence of a significant association between long-term WFH and industry group for the 2020 survey (at the 5% level of statistical significance), as shown in Panel D (Table 6). However, such evidence is not found in the 2021 cohort.

For the MSE MDs who expect more employees to take up the long-term WFH approach, more than 60% of respondents are early followers. Specifically, the proportions reported in the far-right column of Table 5 are significantly larger than the corresponding proportions with “fewer” or the “same” number of employees taking up WFH arrangements. Additionally, late

Technology group	Fewer (1)		Long-term WFH Same (2)		More (3)	
	<i>n</i>	Col (%)	<i>n</i>	Col (%)	<i>n</i>	Col (%)
<i>Panel A: Technology group, whole sample (n = 648)</i>						
Pioneers	40	29.0	78	21.4	31	21.4
Early followers	53	38.4	162	44.4	93	64.1*(1),(2)
Late followers	45	32.6*(3)	125	34.2*(3)	21	14.5
Total	138	100.0	365	100.0	145	100.0
Chi-Sq test stat. = 28.67*, df = 4						
<i>Panel B: Technology group, by year</i>						
<i>Yr. 2020 (n = 328)</i>						
Pioneers	3	21.4	45	20.7	19	19.6
Early followers	4	28.6	97	44.7	64	66.0*(1),(2)
Late followers	7	50.0*(3)	75	34.6*(3)	14	14.4
Total	14	100.0	217	100.0	97	100.0
Chi-Sq test stat. = 18.89*, df = 4						
<i>Yr. 2021 (n = 320)</i>						
Pioneers	37	29.8	33	22.3	12	25.0
Early followers	49	39.5	65	43.9	29	60.4*(1)
Late followers	38	30.7	50	33.8*(3)	7	14.6
Total	124	100.0	148	100.0	48	100.0
Chi-Sq test stat. = 9.49*, df = 4						

**Notes:** “\*” on the far-left column denotes the Pearson Chi-Square Test statistics that can be rejected at the 5% level of statistical significance. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion. Significance level for numbered proportions (“1”, “2”, “3”) is 5%

**Source:** Table by authors

**Table 5.** Long-term WFH by technology group

Industry group	Fewer (1)		Long-term WFH Same (2)		More (3)	
	<i>n</i>	Col (%)	<i>n</i>	Col (%)	<i>n</i>	Col (%)
<i>Panel C: Industry group, whole sample (n = 641)</i>						
Commerce and Sales	26	19.1	76	20.9	19	13.5
Construction and Manufacturing	41	30.1	131	36.0	36	25.5
Financials and Services	41	30.2	91	25.0	51	36.2*(2)
Health and Education	7	5.2	24	6.6	10	7.1
IT and Media	21	15.4	42	11.5	25	17.7
Total	136	100.0	364	100.0	141	100.0
Chi-Sq test stat. = 14.93, df = 8						
<i>Panel D: Industry group, by year</i>						
<i>Yr. 2020 (n = 331)</i>						
Commerce and Sales	1	7.1	54	24.7*(3)	12	12.2
Construction and Manufacturing	7	50.0	80	36.5	26	26.5
Financials and Services	4	28.6	49	22.4	37	37.8*(2)
Health and Education	2	14.3	15	6.8	7	7.1
IT and Media	0	0.0	21	9.6	16	16.4
Total	14	100.0	219	100.0	98	100.0
Chi-Sq test stat. = 20.74*, df = 8						
<i>Yr. 2021 (n = 328)</i>						
Commerce and Sales	25	20.5	22	15.2	7	16.3
Construction and Manufacturing	34	27.9	51	35.2	10	23.3
Financials and Services	37	30.3	42	29.0	14	32.6
Health and Education	5	4.1	9	6.1	3	7.0
IT and Media	21	17.2	21	14.5	9	20.8
Total	122	100.0	145	100.0	43	100.0
Chi-Sq test stat. = 4.96, df = 8						
<b>Notes:</b> "*" on the far-left column denotes the Pearson Chi-Square Test statistics that can be rejected at the 5% level of statistical significance. For each significant pair, the key of the category with the smaller column proportion appears in the category with the larger column proportion. Significance level for numbered proportions ("1", "2", "3") is 5%						
<b>Source:</b> Table by authors						

**Table 6.**  
Long-term WFH by  
industry group

followers tend to exhibit significantly larger proportions of MSEs with the "same" or "fewer" numbers of employees WFH in the long term. For the pioneers, there is no evidence of a significant difference in proportions across the three response categories, with proportions ranging from 21.4% to 29%, as shown in Panel A. The test of no association between the column and row variables is rejected in the whole sample and across the sample period, suggesting clear evidence of an association between the long-term WFH arrangements and the adoption of technology by Swiss MSEs.

The Financials and Services industry in Panel D (Table 6) provides evidence of MSEs expecting more employees to take up WFH arrangements in the future. For the Commerce and Sales industry, a significantly larger proportion of MSE MDs expects the same number of employees WFH compared with respondents who expect more employees to take up WFH arrangements. However, in the 2021 subsample tabulated at the bottom of Panel D, there is no evidence of an association between the column and row variables. Consistently with the results presented in Table 4, this would suggest that WFH is viewed mainly as an alternative to the conventional work settings in the 2020 survey. In the subsequent 2021 survey, MDs revised their long-term expectations downwards regarding WFH. Overall,

---

there is sufficient evidence to support the third hypothesis that long-term WFH arrangements are related to technology adoption and industry groups.

## 5. Discussion

This study analysed the DT behaviours of MSEs in WFH settings during the first and second mandated COVID-19 lockdowns in Switzerland. It extends prior research by investigating the prevalence of WFH, the application of technological (digital) typologies, the differences across industries within the MSE sector, and the MDs' strategic long-term view of WFH. The following discussion highlights the contributions to the literature and practice, proposes practice recommendations, points out the limitations and offers avenues for further research.

### 5.1 Contributions to the literature

From a methodological perspective, this research contributes to the literature with a unique and robust dataset comprising two surveys, each with over 500 telephonic responses gathered from MSE MDs across the major language regions in Switzerland. In contrast to previous studies that investigated large organisations (Reuschl *et al.*, 2022), we focused on the MSE sector as it represents the greatest number of businesses in Switzerland and globally [Federal Statistical Office (FSO), 2020a; International Labour Organization (ILO), 2022].

The degree of progress of DT and, thus, the use of technology is a deciding factor in the MSEs' WFH ability. Our study suggests that MSEs leading the adoption of technology (pioneers) implemented WFH arrangements to a higher degree than the early and late followers, with the late followers lagging substantially. Consistent with Carayannis and Wang (2012), early followers demonstrated their adaptive nature as they competed with pioneers. Hence, the early followers adapted quite well to WFH requirements during the two COVID-19 lockdowns in Switzerland. However, it became apparent that late followers generally rely on physical human interactions in delivering their services, as demonstrated by the Health and Education industry.

This MSE-focused study supports evidence from previous observations on household surveys (Etheridge *et al.*, 2020; Felstead and Reuschke, 2020) that the degree of WFH strongly depends on the industry in which enterprises work in. Like earlier studies, we found that the IT and Media industry had the highest degree of WFH (Etheridge *et al.*, 2020), followed by Financials and Services (Adams-Prassl *et al.*, 2020). In the MSE sector specifically, it appears that IT-intensive industry groups offer a higher chance to work remotely, with technology acting as an enabler of new business models like WFH. As alluded to by Cziśla (2014) and Kraft *et al.* (2022), such models can be assumed to further increase DT.

In reviewing the literature, no research was found on the MSE WFH discussion with a long-term, strategic perspective. While overall historical data [e.g. Federal Statistical Office (FSO), 2020b] merely show an upward trend toward WFH, this research provides more nuanced findings. The MSE MDs' views suggest a relationship between long-term WFH arrangements and technology adoption. That is, MDs see WFH as an appropriate alternative to the conventional work settings wherever it is suitable – and required again in extraordinary situations. Somewhat surprisingly, this view was stronger in 2020 than in 2021, which may be related to relaxed pandemic restrictions and control measures. Therefore, it would be interesting to conduct a new survey asking the MSE MDs' perspectives again. However, the new uncertainty of the current and rising worldwide energy crisis may be an additional factor coming into play, potentially triggering WFH so enterprises can save energy and transportation costs.

Another important finding is that the MSE MDs within the Financial and Services industry predict more of their staff will be working remotely. This view may imply that this industry group can further increase the degree of DT. It is consistent with Diener and Špaček (2021), who found the need for banks to accelerate their DT process to become more

digitally developed. In contrast, the Commerce and Sales industry group's perspective is that the number of employees WFH will remain stable, suggesting that the WFH potential is limited as face-to-face contact with customers is still important.

Overall, our study confirms some existing research and extends the literature with a unique data set on MSEs, their MDs' strategic view and the CATI approach that was not found in previous studies.

### *5.2 Contributions and recommendations to practice*

Our study shows that MSE technology investments and WFH behaviours are linked to business practice and strategic decision-making. Regarding their strategic intent, MSE pioneers seem to have strategies for new work and a technology roadmap towards higher adoption of WFH arrangements. On the other hand, early followers have a less stringent strategic intent to adopt WFH (like the late followers). Therefore, we recommend that firm-wide debates on needs and options for WFH be linked with technology roadmap discussions, implying senior management has technology knowledge and planning skills for WFH strategies.

However, senior management often does not possess the required digital knowledge and skills (Scheurer, 2005; Omrani *et al.*, 2022) for effective (strategic) decision-making. Therefore, we further recommend digital capability development for senior executives. Digital capabilities are a fundamental element of understanding DT (Battisti *et al.*, 2022; Malchenko *et al.*, 2020) for DT readiness (Švarc *et al.*, 2021), and developing such digital capabilities is a strategic tool for a business entity (Ofori-Amanfo *et al.*, 2022; Pagoropoulos *et al.*, 2017).

Some industries have low WFH adoptions (e.g. Commerce and Sales and Construction and Manufacturing) due to the nature of the firms, including tasks, roles, process structures and customers, while others have high WFH adoptions (e.g. IT and Media and Financials and Services). While industry-specific differences exist, we recommend that management investigates the potential for further expanding the WFH arrangements. This may include evaluating how cloud systems, artificial intelligence or social media may contribute to the operations and opportunities of MSEs. This may result in an organisational change process, including cultural change. Hence, a clear and consistent strategic digital approach for remote work is vital across all industries. As such, consideration must be given, for example, to organisational and individual capabilities and their potential development, current (and future) organisational values (e.g. sustainability), customer needs, risk mitigation (e.g. pandemic) and policy implementation (Bai *et al.*, 2021; Neher *et al.*, 2022).

Organisational policies play an essential role in DT and digitisation across all industry sectors and technology groups as they focus on using digital technologies in their internal processes to shape the organisation, management, culture and values (Torfs *et al.*, 2022). Therefore, we recommend that MSEs integrate digital policies mainly to alleviate legal, ethical, reputational and security risks (Mazzei and Butera, 2016). At the same time, we recommend that policymakers offer a standardised toolset to MSEs as they may not have the resources and skillset to create comprehensive digital policies. It would also be helpful if policymakers could provide training programs to support MSEs in the digital age.

As IT-intensive industries are more likely to adopt WFH arrangements, employees will also have higher expectations about WFH, such as flexible WFX options, thus adding pressure on management to take proactive action. This management challenge is further driven by individual (and changing) employee preferences for WFH, resulting in many firms still experimenting to find the right balance between employee and manager expectations (Smite *et al.*, 2023). Our research results suggest that early followers have the highest intention to provide WFH opportunities in the future and, therefore, may become more



attractive employers. Consequently, we recommend that management creates conditions to meet employees' expectations for work flexibility.

Industries with low WFH adoption and a high share of late followers (e.g. Health and Education) may strategically focus on technology adoption to increase work efficiencies than on enabling WFH in the long term. Nevertheless, for industries with low WFH adoption and late follower firms, we propose a blended approach with WFH being an optional component but not a determining factor in their strategies. For example, in the education sector, a non-pioneer sector, COVID-19 has demonstrated the importance of face-to-face teaching for many students while at the same time acknowledging the benefits of (remote) online pedagogy (Ni Fhloinn and Fitzmaurice, 2021). Hence, student diversity needs to be considered for the mode of teaching. While remote education may not be appropriate for some students, digital tools in the classroom, however, are indispensable nowadays.

Overall, the discussion on technology groups illustrates the variation between the pioneers, the early followers and the late adopters. However, it does not imply a tendency that the pioneers are better than the laggards. Eventually, the industry and the customers will influence the work mode. However, each MSE chooses to exploit their digital potential and options for WFH within its environment. MDs' long-time perspective will guide MSEs' strategic decision-making regarding technological investments, ensuring digital competitiveness as part of their strategic initiatives.

### *5.3 Limitations and avenues for further research*

The generalisability of the results is subject to certain limitations. Firstly, we did not include the smallest micro-enterprises with one to three employees due to several constraints, as discussed earlier. Secondly, the sample is limited to Swiss MSEs. Hence, the study may benefit from extending the data set to, for example, SMEs or an international data set, allowing for regional and cultural comparisons. Despite its limitations, our study adds to understanding the relationship between WFH and technological/digital typologies, industry differences and MSEs' strategic long-term views of WFH settings.

We suggest repeating the study, that is, conducting a new survey to investigate whether similar patterns persist or whether the abolishment of COVID-19 restrictions in most countries changes the MDs' appreciation of WFH settings as part of their firms' strategies. Also, it would be interesting to capture the employees' viewpoints to compare and contrast the perspectives across the organisation.

## **6. Conclusions**

The purpose of this study was to better understand technology adoption and WFH behaviour in MSEs during the first two COVID-19 lockdowns. Based on data from over 1,000 MSE interviews, the study shows that the pandemic has accelerated the DT of work. Large differences in WFH adoption exist between those MSEs leveraging technology early (i.e. pioneers) and those who follow later (i.e. early followers and late followers) and in IT-intensive industries versus more human-interaction-centred service industries.

In testing the hypotheses, our study shows that during the COVID-19 pandemic period, the degree of technology adoption by Swiss MSEs is associated with the implementation of WFH arrangements; that MSEs in information-intensive industries exhibit greater proportions of employees WFH; and that long-term prospects of Swiss MSEs' WFH behaviours after COVID-19 are not just prevalent in pioneer MSEs, but predominantly in the early follower category.

For MSEs to take advantage of WFH arrangements and lead the pack, knowledge, planning and digital capabilities on remote work and technology roadmaps have become important factors in uncertain times.

## References

- Adams-Prassl, A., Boneva, T., Golin, M. and Rauh, C. (2020), "Work that can be done from home: evidence on variation within and across occupations and industries (IZA DP no. 13374)", available at: <https://docs.iza.org/dp13374.pdf>
- Bai, C., Quayson, M. and Sarkis, J. (2021), "COVID-19 pandemic digitization lessons for sustainable development of micro-and small- enterprises", *Sustainable Production and Consumption*, Vol. 27, pp. 1989-2001, doi: [10.1016/j.spc.2021.04.035](https://doi.org/10.1016/j.spc.2021.04.035).
- Barua, A., Konana, P., Whinston, A.B. and Yin, F. (2004), "An empirical investigation of net-enabled business value", *MIS Quarterly*, Vol. 28 No. 4, pp. 585-620.
- Battisti, E., Alfiero, S. and Leonidou, E. (2022), "Remote working and digital transformation during the COVID-19 pandemic: economic-financial impacts and psychological drivers for employees", *Journal of Business Research*, Vol. 150, pp. 38-50.
- Carayannis, E.G. and Wang, V.W.L. (2012), "Competitiveness model—a double diamond", *Journal of the Knowledge Economy*, Vol. 3 No. 3, pp. 280-293, doi: [10.1007/s13132-011-0038-7](https://doi.org/10.1007/s13132-011-0038-7).
- Chanias, S., Myers, M.D. and Hess, T. (2019), "Digital transformation strategy making in pre-digital organizations: the case of a financial services provider", *The Journal of Strategic Information Systems*, Vol. 28 No. 1, pp. 17-33, doi: [10.1016/j.jsis.2018.11.003](https://doi.org/10.1016/j.jsis.2018.11.003).
- Cotterell, D. and Bowen, R. (2021), "SME resilience during the covid-19 pandemic: exploring urban-rural differences", available at: <https://regions.regionalstudies.org/ezone/article/sme-resilience-covid-19?print=print>
- Cziesla, T. (2014), "A literature review on digital transformation in the financial service industry", available at: <https://aisel.aisnet.org/bled2014/18>
- Dabić, M., Maley, J.F., Švarc, J. and Poček, J. (2023), "Future of digital work: challenges for sustainable human resources management", *Journal of Innovation and Knowledge*, Vol. 8 No. 2, p. 100353.
- Diener, F. and Špaček, M. (2021), "Digital transformation in banking: a managerial perspective on barriers to change", *Sustainability*, Vol. 13 No. 4, pp. 1-26, doi: [10.3390/su13042032](https://doi.org/10.3390/su13042032).
- Etheridge, B., Wang, Y. and Tang, L. (2020), "Worker productivity during lockdown and working from home: evidence from self-reports", ISER Working Paper Series, No. 2020-12, University of Essex Institute for Social and Economic Research (ISER), available at: [www.econstor.eu/handle/10419/248579](http://www.econstor.eu/handle/10419/248579).
- Faherty, U. and Stephens, S. (2016), "Innovation in micro enterprises: reality or fiction?", *Journal of Small Business and Enterprise Development*, Vol. 23 No. 2, pp. 349-362, doi: [10.1108/JSBED-11-2013-0176](https://doi.org/10.1108/JSBED-11-2013-0176).
- Federal Statistical Office (FSO) (2008), "NOGA 2008 general classification of economic activities: Explanatory notes", available at: [www.bfs.admin.ch/bfs/en/home/statistics/industry-services/nomenclatures/noga.html](http://www.bfs.admin.ch/bfs/en/home/statistics/industry-services/nomenclatures/noga.html)
- Federal Statistical Office (FSO) (2019), "Structural business statistics STATENT 2017", available at: [www.bfs.admin.ch/news/de/2019-0454](http://www.bfs.admin.ch/news/de/2019-0454)
- Federal Statistical Office (FSO) (2020a), "Anteil der unternehmen nach grössenklassen und wirtschftssektor, 2018", available at: [www.bfs.admin.ch/bfs/de/home/aktuell/neue-veroeffentlichungen.assetdetail.14107139.html](http://www.bfs.admin.ch/bfs/de/home/aktuell/neue-veroeffentlichungen.assetdetail.14107139.html)
- Federal Statistical Office (FSO) (2020b), "Teleheimarbeit", available at: [www.bfs.admin.ch/bfs/de/home/statistiken/kultur-medien-informationsgesellschaft-sport/informationsgesellschaft/gesamtindikatoren/volkswirtschaft/teleheimarbeit.assetdetail.12667037.html](http://www.bfs.admin.ch/bfs/de/home/statistiken/kultur-medien-informationsgesellschaft-sport/informationsgesellschaft/gesamtindikatoren/volkswirtschaft/teleheimarbeit.assetdetail.12667037.html)

- Federal Statistical Office (FSO) (2023), "Hauptsprachen in der schweiz", available at: [www.bfs.admin.ch/bfs/en/home/statistics/population/languages-religions/languages.assetdetail.24205419.html](http://www.bfs.admin.ch/bfs/en/home/statistics/population/languages-religions/languages.assetdetail.24205419.html)
- Felstead, A. and Reuschke, D. (2020), "Homeworking in the UK: before and during the 2020 lockdown (WISERD report)", WISERD, Cardiff, available at: <https://wiserd.ac.uk/publications/homeworking-uk-and-during-2020-lockdown>
- Hinings, B., Gegenhuber, T. and Greenwood, R. (2018), "Digital innovation and transformation: an institutional perspective", *Information and Organization*, Vol. 28 No. 1, pp. 52-61, doi: [10.1016/j.infoandorg.2018.02.004](https://doi.org/10.1016/j.infoandorg.2018.02.004).
- International Labour Organization (ILO) (2022), "The power of small: Unlocking the potential of SMEs", available at: [www.ilo.org/infostories/en-GB/Stories/Employment/SMEs#intro](http://www.ilo.org/infostories/en-GB/Stories/Employment/SMEs#intro)
- Kafetzopoulos, D. and Gotzamani, K. (2022), "The effect of talent management and leadership styles on firms' sustainable performance", *European Business Review*, Vol. 34 No. 6, pp. 837-857.
- Kalićanin, D. (2008), "A question of strategy: to be a pioneer or a follower?", *Economic Annals*, Vol. 53 No. 177, pp. 89-102, doi: [10.2298/EKA0877089K](https://doi.org/10.2298/EKA0877089K).
- Kim, S. and Couper, M.P. (2020), "Feasibility and quality of a national RDD smartphone web survey: comparison with a cell phone CATI survey", *Social Science Computer Review*, Vol. 39 No. 6, pp. 1218-1236, doi: [10.1177/0894439320964135](https://doi.org/10.1177/0894439320964135).
- Kimuli, S.N.L., Sendawula, K. and Nagujja, S. (2021), "Digital technologies in micro and small enterprise: evidence from Uganda's informal sector during the COVID-19 pandemic", *World Journal of Science, Technology and Sustainable Development*, Vol. 18 No. 2, pp. 93-108, doi: [10.1108/WJSTSD-02-2021-0017](https://doi.org/10.1108/WJSTSD-02-2021-0017).
- Kraft, C., Lindeque, J.P. and Peter, M.K. (2022), "The digital transformation of Swiss small and medium-sized enterprises: insights from digital tool adoption", *Journal of Strategy and Management*, Vol. 15 No. 3, pp. 468-494, doi: [10.1108/JSMA-02-2021-0063](https://doi.org/10.1108/JSMA-02-2021-0063).
- Kraus, S., Durst, S., Ferreira, J.J., Veiga, P., Kailer, N. and Weinmann, A. (2022), "Digital transformation in business and management research: an overview of the current status quo", *International Journal of Information Management*, Vol. 63, p. 102466.
- Kretschmer, T. and Khashabi, P. (2020), "Digital transformation and organization design: an integrated approach", *California Management Review*, Vol. 62 No. 4, pp. 86-104, doi: [10.1177/0008125620940296](https://doi.org/10.1177/0008125620940296).
- Kurkland, N.B. and Bailey, D.E. (1999), "The advantages and challenges of working here, there, anywhere, and anytime", *Organizational Dynamics*, Vol. 28 No. 2, pp. 53-68, doi: [10.1016/S0090-2616\(00\)80016-9](https://doi.org/10.1016/S0090-2616(00)80016-9).
- Leontie, V., Maha, L.-G. and Stoian, I.C. (2022), "COVID-19 pandemic and its effects on the usage of information technologies in the construction industry: the case of Romania", *Buildings*, Vol. 12 No. 2, pp. 1-29, doi: [10.3390/buildings12020166](https://doi.org/10.3390/buildings12020166).
- Lieberman, M.B. and Montgomery, D.B. (1988), "First-mover advantages", *Strategic Management Journal*, Vol. 9 No. S1, pp. 41-58, doi: [10.1002/smj.4250090706](https://doi.org/10.1002/smj.4250090706).
- Lieberman, M.B. and Montgomery, D.B. (1998), "First-mover (dis)advantages: retrospective and link with the resource-based view", *Strategic Management Journal*, Vol. 19 No. 12, pp. 1111-1125, doi: [10.1002/\(SICI\)1097-0266\(199812\)19:12<1111::AID-SMJ21>3.0.CO;2-W](https://doi.org/10.1002/(SICI)1097-0266(199812)19:12<1111::AID-SMJ21>3.0.CO;2-W).
- López-Igual, P. and Rodríguez-Modroño, P. (2020), "Who is teleworking and where from? Exploring the main determinants of telework in Europe", *Sustainability*, Vol. 12 No. 21, pp. 1-15, doi: [10.3390/su12218797](https://doi.org/10.3390/su12218797).
- Maiti, M., Krakovich, V., Shams, S.R. and Vukovic, D.B. (2020), "Resource-based model for small innovative enterprises", *Management Decision*, Vol. 58 No. 8, pp. 1525-1541, doi: [10.1108/MD-06-2019-0725](https://doi.org/10.1108/MD-06-2019-0725).
- Malchenko, Y., Gogua, M., Golovacheva, K., Smirnova, M. and Alkanova, O. (2020), "A critical review of digital capability frameworks: a consumer perspective", *Digital Policy, Regulation and Governance*, Vol. 22 No. 4, pp. 269-288, doi: [10.1108/DPRG-02-2020-0028](https://doi.org/10.1108/DPRG-02-2020-0028).

- Mancha, R. and Shankaranarayanan, G. (2020), "Making a digital innovator: antecedents of innovativeness with digital technologies", *Information Technology and People*, Vol. 34 No. 1, pp. 318-335, doi: [10.1108/ITP-12-2018-0577](https://doi.org/10.1108/ITP-12-2018-0577).
- Mazzei, A. and Butera, A. (2016), "Brand consistent behavior of employees on social media: the role of social media governance and policies", *The Journal of the Italian Marketing Association*, Vol. 4, pp. 1-22, doi: [10.3280/MC2016-004006](https://doi.org/10.3280/MC2016-004006).
- Messenger, J.C. (2019), "Telework in the 21st century: an evolutionary perspective", in Messenger, J.C. (Ed.), *Telework in the 21st Century*, Edward Elgar Publishing, pp. 1-352, doi: [10.4337/9781789903751.00005](https://doi.org/10.4337/9781789903751.00005).
- Nagel, L. (2020), "The influence of the COVID-19 pandemic on the digital transformation of work", *International Journal of Sociology and Social Policy*, Vol. 40 Nos 9/10, pp. 861-875, doi: [10.1108/IJSSP-07-2020-0323](https://doi.org/10.1108/IJSSP-07-2020-0323).
- Neher, A., Wong, A. and Miles, M.P. (2022), "The relationship between the level of a corporation's public disclosure of its managerial values and its level of organizational authenticity", *European Business Review*, Vol. 34 No. 2, pp. 277-296.
- Ni Fhloinn, E. and Fitzmaurice, O. (2021), "Challenges and opportunities: experiences of mathematics lecturers engaged in emergency remote teaching during the COVID-19 pandemic", *Mathematics*, Vol. 9 No. 18, pp. 2-18, doi: [10.3390/math9182303](https://doi.org/10.3390/math9182303).
- Ofori-Amanfo, J., Akonsi, S.W. and Agyapong, G.K.Q. (2022), "The impact of organisational capabilities on the performance of small-and medium-sized enterprises (SMEs)", *European Business Review*, Vol. 34 No. 5, pp. 642-665.
- Omrani, N., Rejeb, N., Maalaoui, A., Dabić, M. and Kraus, S. (2022), "Drivers of digital transformation in SMEs", *IEEE Transactions on Engineering Management*, doi: [10.1109/TEM.2022.3215727](https://doi.org/10.1109/TEM.2022.3215727).
- Pagoropoulos, A., Maier, A. and McAloone, T.C. (2017), "Assessing transformational change from institutionalising digital capabilities on implementation and development of product-service systems: learnings from the Maritime industry", *Journal of Cleaner Production*, Vol. 166, pp. 369-380, doi: [10.1016/j.jclepro.2017.08.019](https://doi.org/10.1016/j.jclepro.2017.08.019).
- Pantano, E., Pedeliento, G. and Christodoulides, G. (2022), "A strategic framework for technological innovations in support of the customer experience: a focus on luxury retailers", *Journal of Retailing and Consumer Services*, Vol. 66, pp. 1-10, doi: [10.1016/j.jretconser.2022.102959](https://doi.org/10.1016/j.jretconser.2022.102959).
- Panteli, N., Nurse, J.R., Collins, E. and Williams, N. (2022), "Trust disruption and preservation in the Covid-19 work from home context", *Journal of Workplace Learning*, Vol. 35 No. 3, pp. 1-16, doi: [10.1108/JWL-02-2022-0017](https://doi.org/10.1108/JWL-02-2022-0017).
- Papadopoulos, T., Baltas, K.N. and Balta, M.E. (2020), "The use of digital technologies by small and medium enterprises during COVID-19: implications for theory and practice", *International Journal of Information Management*, Vol. 55, pp. 1-13, doi: [10.1016/j.ijinfomgt.2020.102192](https://doi.org/10.1016/j.ijinfomgt.2020.102192).
- Park, C. (2020), "Market entry strategies in a high-tech successive generations market: a case study of three semiconductor firms with different entry modes", *Journal of Business and Industrial Marketing*, Vol. 35 No. 11, pp. 1751-1766, doi: [10.1108/JBIM-08-2019-0354](https://doi.org/10.1108/JBIM-08-2019-0354).
- Peter, M.K., Kraft, C. and Lindeque, J. (2020), "Strategic action fields of digital transformation", *Journal of Strategy and Management*, Vol. 13 No. 1, pp. 160-180, doi: [10.1108/JSMA-05-2019-0070](https://doi.org/10.1108/JSMA-05-2019-0070).
- Pilkington, A. (2017), "The role of the internal communication Practitioner", Ruck, K. (Ed.), *Exploring Internal Communication: Towards Informed Employee Voice*, (3rd ed.) Taylor and Francis, Farnham, pp. 177-188, doi: [10.4324/9781315255620](https://doi.org/10.4324/9781315255620).
- Reddy, S.K. and Reinartz, W. (2017), "Digital transformation and value creation: sea change ahead", *NIM Marketing Intelligence Review*, Vol. 9 No. 1, pp. 10-17, doi: [10.1515/gfkmir-2017-0002](https://doi.org/10.1515/gfkmir-2017-0002).
- Reuschl, A.J., Deist, M.K. and Maalaoui, A. (2022), "Digital transformation during a pandemic: stretching the organizational elasticity", *Journal of Business Research*, Vol. 144, pp. 1320-1332, doi: [10.1016/j.jbusres.2022.01.088](https://doi.org/10.1016/j.jbusres.2022.01.088).

- Rousselet, G.A., Pernet, C.R. and Wilcox, R.R. (2021), "The percentile bootstrap: a primer with step-by-step instructions in R", *Advances in Methods and Practices in Psychological Science*, Vol. 4 No. 1, doi: [10.1177/2515245920911881](https://doi.org/10.1177/2515245920911881).
- Schallmo, D.R.A. and Williams, C.A. (2018), *Digital Transformation Now! Guiding the Successful Digitalization of Your Business Model*, Springer International Publishing, Cham.
- Scheurer, W.T. (2005), *A Model for Strategy and Tactical Steps That Create Enterprise Capability*, University of Minnesota, Minnesota, pp. 1-32.
- Shamsie, J., Phelps, C. and Kuperman, J. (2004), "Better late than never: a study of late entrants in household electrical equipment", *Strategic Management Journal*, Vol. 25 No. 1, pp. 69-84, doi: [10.1002/smj.364](https://doi.org/10.1002/smj.364).
- Singh, R.K. and Kumar, R. (2020), "Strategic issues in supply chain management of Indian SMEs due to globalization: an empirical study", *Benchmarking: An International Journal*, Vol. 27 No. 3, pp. 913-932, doi: [10.1108/BIJ-09-2019-0429](https://doi.org/10.1108/BIJ-09-2019-0429).
- Smite, D., Moe, N.B., Klotins, E. and Gonzalez-Huerta, N. (2021), "From forced working-from-home to working-from-anywhere: two revolutions in telework", pp. 1-8, [10.48550/arXiv.2101.08315](https://doi.org/10.48550/arXiv.2101.08315).
- Smite, D., Moe, N.B., Hildrum, J., Gonzalez-Huerta, J. and Mendez, D. (2023), "Work-from-home is here to stay: call for flexibility in post-pandemic work policies", *Journal of Systems and Software*, Vol. 195, p. 111552.
- Suarez, F.F. and Lanzolla, G. (2007), "The role of environmental dynamics in building a first mover advantage theory", *Academy of Management Review*, Vol. 32 No. 2, pp. 377-392, doi: [10.5465/amr.2007.24349587](https://doi.org/10.5465/amr.2007.24349587).
- Švarc, J., Lažnjak, J. and Dabić, M. (2021), "The role of national intellectual capital in the digital transformation of EU countries. Another digital divide?", *Journal of Intellectual Capital*, Vol. 22 No. 4, pp. 768-791.
- Tanner, A. (2015), "Heimarbeit", available at: <https://hls-dhs-dss.ch/de/articles/016213/2015-03-09/>
- Teece, D.J. (2018), "Profiting from innovation in the digital economy: enabling technologies, standards, and licensing models in the wireless world", *Research Policy*, Vol. 47 No. 8, pp. 1367-1387, doi: [10.1016/j.respol.2017.01.015](https://doi.org/10.1016/j.respol.2017.01.015).
- Torfs, I., Wayenberg, E. and Danneels, L. (2022), "Institutional shifts and punctuated patterns in digital policy", *Review of Policy Research*, Vol. 40 No. 3, pp. 1-26, doi: [10.1111/ropr.12507](https://doi.org/10.1111/ropr.12507).
- van der Lippe, T. and Lippényi, Z. (2020), "Co-workers working from home and individual and team performance", *New Technology, Work and Employment*, Vol. 35 No. 1, pp. 60-79, doi: [10.1111/ntwe.12153](https://doi.org/10.1111/ntwe.12153).
- Vial, G. (2019), "Understanding digital transformation: a review and a research agenda", *The Journal of Strategic Information Systems*, Vol. 28 No. 2, pp. 118-144, doi: [10.1016/j.jsis.2019.01.003](https://doi.org/10.1016/j.jsis.2019.01.003).
- Wuersch, L., Neher, A. and Peter, M.K. (2020), "Digital internal communication linking to organisational culture", paper presented at Australasian Business Ethics Network Conference, 7-9 December, online.
- Wuersch, L., Neher, A. and Peter, M.K. (2022), "Digital internal communication: an interplay of socio-technical elements", *International Journal of Management Reviews*, Vol. 25 No. 3, pp. 1-26, doi: [10.1111/ijmr.12323](https://doi.org/10.1111/ijmr.12323).
- Zhani, N., Mouri, N. and Hamdi, A. (2021), "Can a technology firm desire too much of a good thing? The double-edged sword effects of technology orientation on performance", *European Business Review*, Vol. 33 No. 5, pp. 725-741.

### Further reading

- Kelliher, F. and Reindl, L. (2009), "A resource-based view of micro-firm management practice", *Journal of Small Business and Enterprise Development*, Vol. 16 No. 3, pp. 521-532, doi: [10.1108/14626000910977206](https://doi.org/10.1108/14626000910977206).

---

**Appendix 1**

Selected survey questions from the computer-assisted telephone interviewing (the complete survey may be made available upon request). Conditions and instructions for CATI are provided in *italic* text.

C1. Quota employees

How many employees does your company have? We refer to the total number of employees, regardless of whether they work part-time or full-time.

- Number of employees: \_\_\_\_\_

*IF UNDER 4 OR OVER 49 MA: QUIT*

C3. In which industry is your company mainly active?

*DO NOT READ OUT/ONLY ONE ANSWER*

- Construction and real estate
- Production/manufacturing
- Education
- Health care and social services
- Services (office, administrative and general)
- Financial services (banking and insurance)
- ICT
- Media/marketing/communication/advertising
- Trading, sales and related businesses
- Hospitality
- Automotive and related businesses
- Agriculture
- Other, namely: \_\_\_\_\_
- Don't know/no answer

F1. Of your [NUMBER EMPLOYEES. C1] employees: How many could theoretically work from home, e.g. do not have to serve customers on-site, drive a vehicle or work on a construction site?

*DO NOT READ OUT/ONLY ONE ANSWER*

- Number of \_\_\_\_\_ employees

F4a. *ONLY IF NUMBER OF EMPLOYEES >=1 IN F1*

Of your [NUMBER EMPLOYEES. C1] employees: How many have worked primarily from home since the beginning of 2021, i.e. while the home office requirement was in effect?

- During home office duty: \_\_\_\_\_ employees

F4b. And how many work mainly from home now that home office is mandatory?

- After home office mandatory: \_\_\_\_\_ employees

F5. *ONLY IF NUMBER OF EMPLOYEES >=1 IN F1*

How do you assess the long-term development: Will your company have more, the same number or fewer employees working from home in the future than during the pandemic?

*DO NOT READ OUT/ONLY ONE ANSWER*



- Less
- Equal number
- More
- Don't know/no answer

Q15. Which of the following statements is most true about your company:

*READ OUT/ONLY ONE ANSWER/DO NOT RANDOMIZE*

- We are always among the first to buy or use new technologies and equipment.
- We only start using new technologies and devices when we know what others have experienced with them.
- We adopt new technologies and equipment only when it is essential for us to do so.
- None of these/don't know/no answer

## Appendix 2

Hypothesis	Questions as per <a href="#">Appendix 1</a>
<i>H1.</i> WFH arrangements are related to technology adoption that reflects the degree of DT embraced by Swiss MSEs	<ul style="list-style-type: none"> <li>• WFH arrangement in place (F4a)</li> <li>• Technology group association (Q15)</li> </ul>
<i>H2.</i> WFH arrangements are related to industry groups, which reflect the degree of reliance on ICT in their service delivery to Swiss consumers	<ul style="list-style-type: none"> <li>• WFH arrangement in place (F4a)</li> <li>• Industry group association (C3)</li> </ul>
<i>H3.</i> Long-term WFH arrangements are related to technology adoption and industry groups of the Swiss MSEs	<ul style="list-style-type: none"> <li>• WFH arrangement in place (F4a)</li> <li>• Long-term development of WFH arrangements (F5)</li> <li>• Technology group association (Q15)</li> <li>• Industry group association (C3)</li> </ul>

**Table A1.** Proposed hypotheses and corresponding survey questions

## Appendix 3

Key industries	Constituents	<i>n</i> *
Commerce and Sales	Commerce, car sales, trades, sales	112
Construction and Manufacturing	Constructions, real estate, manufacturing, agricultural	170
Financials and Services	Banks, financial services	111
Health and Education	Health, social care, education, hospitality	66
IT and Media	Information technology, media	44

**Table A2.** Constituents of the five key industry groups

**Note:** \*Based on the 2020 sample

## About the authors

Marc K. Peter is a Professor of Digital Business at the FHNW School of Business in Switzerland and an Adjunct Professor at Charles Sturt University in Australia. Following a career at eBay, E-Trade

and LexisNexis in Europe and Asia-Pacific, his research and teaching focus is digital strategy, digital transformation, digital marketing and cybersecurity. He studied E-Business Engineering at BFH, Corporate Finance at UC Berkeley; obtained his Master of Marketing from the University of Basel, Executive MBA from BFH/Babson College/PKU and Doctorate from CSU. He is a Fellow of the British Computer Society and Chartered Institute of Marketing. Marc K. Peter is the corresponding author and can be contacted at: [marc.peter@flnw.ch](mailto:marc.peter@flnw.ch)

Lucia Wuersch is a Research Fellow and an Adjunct Lecturer at the School of Business, Charles Sturt University, Australia. She is also an Adjunct Lecturer at the University of Applied Sciences and Arts Northwestern Switzerland. Her research includes, but is not limited to, organisational communication and relationship management. She works on research projects related to the digital transformation of remote work and workplace health and well-being. Lucia completed her PhD in Communication following her BA and MA in Science of Communication. She has more than 10 years of professional experience as a communication professional in Switzerland and internationally.

Alfred Wong is a Senior Lecturer at the School of Business, Charles Sturt University and Research Fellow at the School of Business of the University of Applied Sciences and Arts Northwestern Switzerland. He earned a PhD in Finance from RMIT University in Melbourne, where he was awarded the University Research PrS. He also holds postgraduate and undergraduate degrees from the University of Queensland Business School. His main research interests include the volatility of financial markets, sustainability, health-care economics and workplace transformation. He is a holder of the Financial Risk Manager (FRM) designation certified by the Global Association of Risk Professionals, USA.

Alain Neher is an Associate Head of the School of Business and a Senior Lecturer at Charles Sturt University, Australia. He is also an Adjunct Senior Lecturer and Research Fellow at the University of Applied Sciences and Arts Northwestern Switzerland. Before joining academia, he worked for more than 25 years in the industry including senior management and leadership roles in private, public and not-for-profit organisations, as well as in armed forces logistics focusing on support services. His research interests are in, but not limited to, business ethics, organisational culture and values, performance management, workforce well-being and ESG.