UNIVERSITY OF BAHRAIN

College of Business Administration

Business Administration Department

Determinant Factors for Effective Telework: Evidence from the Telecommunications Sector in Bahrain

"Thesis submitted in partial fulfilment of the requirements for the degree of M.A. in Master of Business Administration."

Prepared by

Qais Mohamed Al Bawab

ID Number: 20091978

Supervised by

Dr. Elsayed A. H. Elamir

Associate Professor

University of Bahrain

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University of Bahrain
Deanship of Graduate Studies
And scientific Research

جامعة البحرين
عمادة الدراسات العليا والبحث العلمي

Thesis Discussion Committee Decision

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The Discussion Committee met on 19-Jan-23 In business college. Upon discussing the student whose details are stated above in public, the discussion committee recommends the following:

The student is awarded a grade A in the thesis subject.

☐ Without making any changes to the thesis.

☒ After making the modifications attached with this decision.

Discussion Committee Members Approval:

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Approved at the University Council 6th meeting, 2013
In accordance with Decision No. 736/2013 dated 14/3/2013
Modified by University Council Decision No. 2043/2013 dated 20/11/2013.

Abstract

This study investigates the effectiveness and productivity of working from home during the COVID-19 pandemic based on seven characteristics from the telecommunications sector in Bahrain, including social, job, teleworker, management, teleworking, crisis and demographic variables. Data from a sample of 104 employers working from home are collected using a questionnaire. A partial least squares regression that ensures the absence of multicollinearity and nonnormality is used as a unique technique to develop two models. The results of these models suggest that the telework effectiveness, teleworker, teleworking and crisis characteristics are statistically significant, whereas the social, job and management characteristics as well as the demographic variables are not statistically significant. These results support the importance of teleworker skills and professional quality variations, such as autonomy, self-discipline, self-motivation, management skills, likely to work during the most prolific period and facilitate working in case of sickness and crisis. Decision makers and managers benefit the most from this study and its results.

Keywords: *COVID-19, crisis, effectiveness, productivity, teleworking, training, management support, partial least squares, regression.*

تبحث هذه الدراسة فعالية وإنتاجية العمل من المنزل في قطاع الاتصالات في مملكة البحرين خلال جائحة كورونا وذلك بناءً على سبع خصائص هي المتغيرات الاجتماعية والمتغيرات الوظيفية ومهارات العاملين عن بعد وخصائص إدارة المؤسسات والخصائص المتعلقة بالعمل عن بعد والعوامل المتعلقة بالأزمات وأخيراً المتغيرات الديموغرافية. ولقد تم جمع البيانات باستخدام استبيان من خلال عينة مكونة من ١٠٤ موظف في قطاع الاتصالات في مملكة البحرين يعملون من المنزل خلال جائحة كرونا. حيث تم استخدام الانحدار بطريقة المربعات الصغرى الجزئي الذي يضمن عدم وجود علاقة خطية متعددة وغير طبيعية كأسلوب فريد لتطوير نموذجين لتحليل نتائج الاستبيان. تشير نتائج هذه النماذج إلى أن خصائص فاعلية العمل عن بُعد ومهارات العاملين عن بعد والعوامل المتعلقة بالأزمات ذات دلالة إحصائية، في حين أن الخصائص الاجتماعية والوظيفية وخصائص إدارة المؤسسات وكذلك المتغيرات الديموغرافية ليست ذات دلالة إحصائية. وتدعم هذه النتائج أهمية مهارات العمل عن بُعد وتنوعات المهارات المهنية المطلوب تواجدها لدى العاملين عن بعد، مثل الاستقلالية والانضباط الذاتي والتحفيز الذاتي ومهارات الإدارة، وأرجحية عمل أعضاء المؤسسات خلال الفترة الأكثر إنتاجية من اليوم بالنسبة لهم وتسهيل العمل في حالة المرض والقيود التي قد تفرضها الأزمات. تقدم هذه الدراسة ونتائجها إفادة وتوصيات لصناع القرار والمدراء في المؤسسات والشركات التي تتيح فرصة العمل عن بعد لموظفيها ومنتسبيها أو تطمح لإدراج هذا النهج في المستقبل.

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Chapter One : Introduction

1.1 Introduction

Many organisational arrangements and management tools shaped in the past century to increase organizational efficiency and productivity. "Teleworking is one of the arrangements or management tools that allows employees to perform job tasks from home without the need for physical existence at the office or at the employer's premises". telecommunications technology revolution in the past two decades plaid main role in rapid practices of teleworking worldwide, telecommunications technology revolution made teleworking easy, economic and operative (Wynarczyk, 2005). According to Dingel and Neiman (2020), 37% of jobs in the United States can be performed over teleworking, such as finance, corporate management and professional and scientific services. Nevertheless, other professions simply cannot be fulfilled from home, such as healthcare, agriculture and manufacturing. The year 2020 began with the coronavirus disease ("COVID-19") pandemic, which resulted in the unexpected lockdown of many countries across the world and compulsory a virtual work environment to reduce social gatherings as much as possible to fight against "COVID-19" (Bick et al., 2020). For example, data from a rich novel survey revealed a 27% increase in the US workforce that worked entirely from home between February and May 2020 and a 35.2% increase in total in May 2020.

Many advantages and challenges accompanying teleworking practice have been observed and outlined by post-COVID-19 pandemic researchers, and managerial practitioners have agreed that teleworking positively affects the

environment, cost saving in office expenses and work–family balance, (Sawhill & Guyot, 2020). Conversely, teleworking also has its challenges or shortcomings, such as employees being concerned about adequate and fair valuation and its effect on career opportunities (Sawhill & Guyot, 2020; Maruyama & Tietze, 2012). Despite the known positive outcomes and pitfalls of teleworking, the "COVID-19 pandemic" has forced organisations to conduct teleworking at different levels to limit the social gathering of employees and to perform the usual tasks. As teleworking has become a must amidst the pandemic, organisations aim to ensure their sustainability and performance. Teleworking is widely used in the Kingdom of Bahrain, and we will examine the outcomes of teleworking practice and the consistency of the results with the literature and other pandemic factors.

COVID-19 spread all over the world in the beginning of 2020. According to the Bahrain Ministry of Health, the first positive case in Bahrain was reported in February 2020. Thus, the government of Bahrain established a set of procedures and regulations in various sectors to fight COVID-19. Accordingly, the government encouraged teleworking in the private sector and reduced public sector office-based employees to 30% during the peak risk periods in mid-2020 and the beginning of 2021.

1.2 Teleworking: Origin and Definition

Human imaginary concluded the ability to perform work at deferent places is possible during 1950s along with telecommunicating and computing technology inventions (Jones 1956, 1957). Teleworking terminology started in the 1970s to combine the two basic elements of the teleworking

concept. First, conducting work away from regular work place. Second, the tool to perform work tasks away from regular work place is information technology (Mitchell, 1995). Since the terminology of teleworking invented there was many similar synonyms to it such as telecommuting, home working, working at a distance off site workers and remote working (Baruch, 2001). According to Baruch (2001) teleworking can be defined as

> *"teleworking occurs when employees perform all or substantial part of their work physically separated from the location of their employer using IT for operation and communication"*

However, the most common and popular terminology of teleworking after COVID-19 pandemic is working from home which narrows the working location away from conventional work place to be the worker`s home as the pandemic restrictions imposed.

1.3 The Telecommunications Sector in Bahrain

According to the recent International Telecommunication Union report, the Kingdom of Bahrain ranks fourth global in the Telecommunication Infrastructure Index, with a reported mobile subscription rate of 140% of the total population, and third globally in terms of the number of internet users at 98%. Moreover, a recent report on market indicators in 2019 shows that the region ranks first in the Arab world and 31st globally in the Information and communication technologies (ICT) Development Index. Bahrain rolled out 5G networks in the first quarter of 2019 and is one of the first countries in the region to establish 5G networks.

Bahrain, which leads in the telecommunications sector, places the country at the forefront of the technological market in the region. The regional offices of many technology-driven companies are located in Bahrain. As it understands the importance of the telecommunications sector as a foundation for economic growth, human development and job creation, the government of the Kingdom of Bahrain established the Telecommunications Regulatory Authority (TRA) to regulate, monitor and develop the telecommunications sector in the country. The telecommunications sector is one of the sectors that contributes the most to the economy of Bahrain and the labour market. According to the 2019 annual report of the TRA, 2,741 employees work in the telecommunications sector, among which ١,٨٦٤ are male and 877 are female.

1.4 Research Problem

At the beginning of 2020, telework practice rapidly spread around the world as a result of government plans to fight COVID-19 social distancing was implemented as much as possible (Belzunegui-Eraso & Erro-Garcés, 2020). Since then, telework has become a necessity not just a work-social balance tool but also as a managerial feature to increase employees' efficiency and satisfaction. Optional and limited telework is no longer the case, as COVID-19 precautionary arrangements have dramatically changed the number of teleworkers compared with conventual workers. Therefore, teleworkers' behavioural and organisational performance may vary in this case.

In this context, we examine the job effectiveness and productivity of teleworkers and the determinant factors associated with it, especially during the "COVID-19 pandemic"; whether the determinant variables of telework effectiveness and productivity remain valid during the pandemic; and the incidental crisis factors associated with teleworking and the other factors associated with telework effectiveness and productivity.

The International Labour Organisation has grouped workers in connected to the physical work location (i.e. office, home or other location) and regularity of working with "ICTs" outside the premises of employer. Three categories were established. First, "regular home-based teleworkers" are employees who use technology nearly full time from home at least several times monthly and in other places less frequently than many times a month. Second, "high-mobile" teleworkers are employees who use technology nearly full time at least many times each week in at least two places other than "the employer's premises" or work daily in at least one other place. Third, incidental teleworkers are employees who use technology always or nearly full time less repeatedly and/or in fewer places than high ICTs.

This study stands for "regular home-based telework" (hereafter, "home-based telework"), which is the modality used in the prevention of COVID-19. Telework is also can be called home office or working from home.

1.5 Research Objectives

At this time, when social distancing is a must, telework has become a necessity. Therefore, managers may question the effectiveness and

productivity of telework. The research objectives of this study are as follows:

- Outline a set of factors at the social, job task, teleworker professional skills, managerial characteristics and crisis characteristics levels in association with telework and demographic variables.
- Examine the implications of the social, professional, technology and crisis factors as they relate to telework effectiveness and productivity.
- Suggest a framework of success factors for managers and supervisors when managing team members remotely. This study will explain some of the employees' preferences and attitudes towards teleworking and how to maximize productivity and effectiveness. Moreover, we examine the consistency of the results with previous research.
- Outline some of the COVID-19 pandemic factors and present their implications for telework effectiveness and productivity.

1.6 Research Significance

In our review of the literature, we did not find any study conducted in Bahrain about this subject. Nevertheless, many studies on teleworking have been conducted in many Arab countries. The significance of this study is threefold. First, this study attempts to determine as many influencing factors as possible on telework effectiveness and productivity, with some factors examined previously in the same context and some derived from other studies on management. A comprehensive framework is developed to examine telework effectiveness and productivity. Second,

the factors are examined during the COVID-19 pandemic, and the effects of the crisis are compared to the post pandemic results and the geographical and demographical effects on the results. Third, management practices and professional relationships have not been analysed previously through adequate empirical studies. Therefore, this study highlights managerial and professional actions and skills to analyse their effects on telework effectiveness and productivity.

The COVID-19 pandemic leaves no option for firms and organisations but to conduct teleworking. Managers are suddenly forced to practice it and manage employees remotely. This study is critical in terms of time frame, and it serves as a reference for managers to obtain an effective and productive framework. The popularity and rapid use of teleworking are expected to continue to increase in the following decades. Therefore, this study enables managers to identify suitable employees for teleworking and to manage them.

1.7 Study Setting

This study was conducted during the semesters of 2020 and 2022. The study examines two biggest telecommunications sectors in Bahrain (Batelco and Zain) as a representative sample. The questionnaire is used to collect data. Furthermore, the partial least squares as a good technique to analyse and obtain the importance of variables is introduced. Part from this thesis is published;see, Bawab and Elamir (2021).

1.8 Research terminology

Term	Definition
Teleworking	Performing work from many places rather than the employer's traditional office or facilities (e.g. home) that enable employers to get their labour vitalities using ICTs ("Nilles, 1997; Pe´rez-Pe´rez, et al., 2003")
Job effectiveness	evaluation of a worker's performance on the job ("Jex, 1998")
Job productivity	Amount of output produced in a specific amount of time (Miller, 2008)
ICTs	Information and communication technologies

Table 1-1 Research Terminology

1.9 Structure of the thesis

This study is organised into six chapters. The first chapter introduces the study by providing an overview, the research objectives, terminologies, significance of the study and the general setting. Chapter two presents a literature review in the kingdom and internationally, as well as researchers' opinions about previous studies. Chapter three introduces the variables and hypothesis, while Chapter four discusses the methods and procedures for data collection. Chapter five analyses the data. Chapter six presents the results, implications, recommendations and limitations.

A flow chart of the research is presented below.

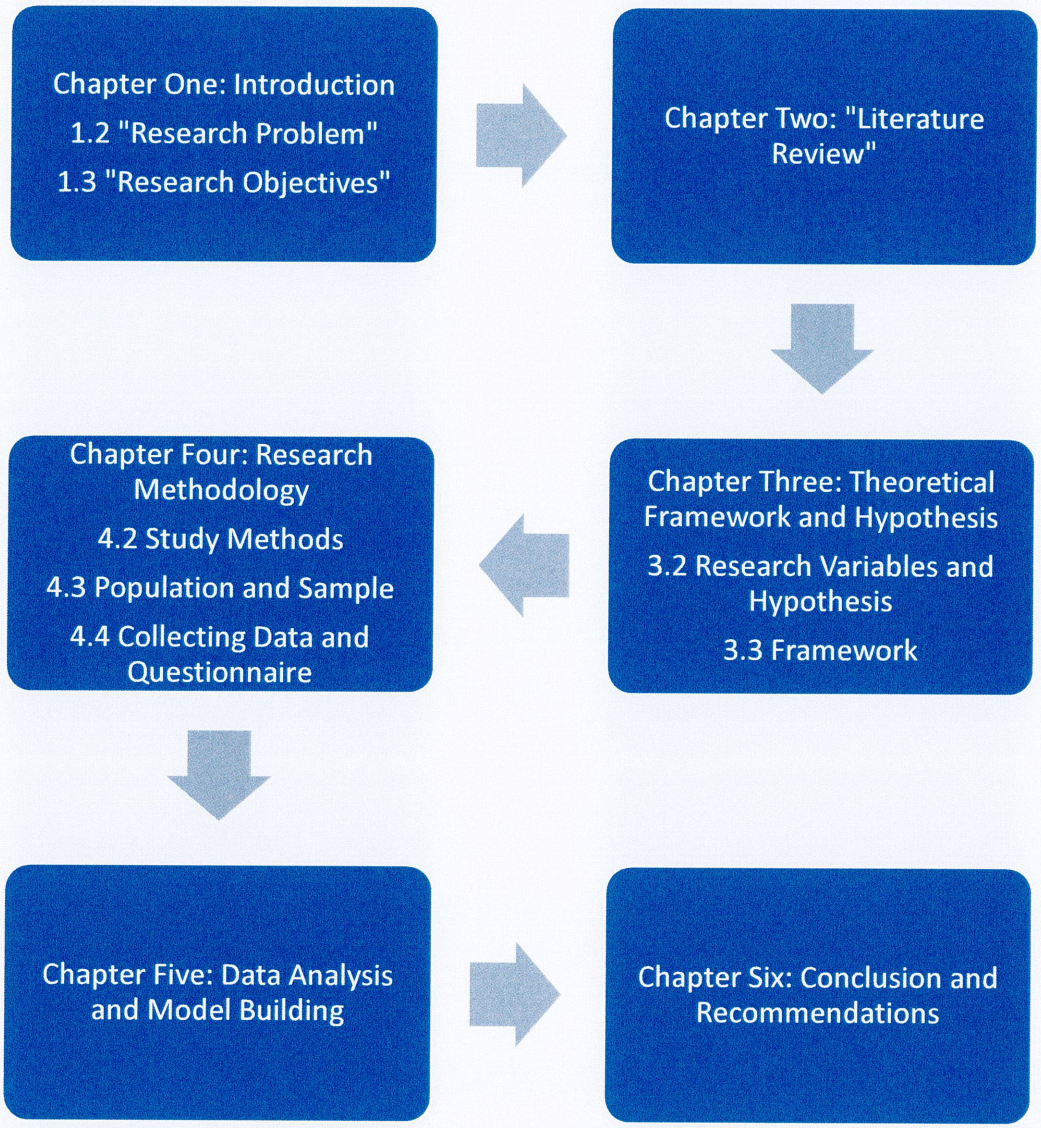


Figure 1—2 Study Method

Chapter Two : Literature Review

2.1 Introduction

In 1957 in the United States was the first documented teleworking case, when federal employees were salaried for work done away from employers' premises. Jack Nilles or the father of teleworking, teleworked from Los Angeles to Washington, D.C. in the beginning of 1960s as a consulting rocket scientist for the US Air Force Space Program. Nilles invented the words 'telecommuting' and 'teleworking' in 1973 (Joice, 2000). Since then, empirical studies have been conducted and published by academics and practitioners, especially in the late 1990s, along with the advent of ICTs. In the following sections, we review the literature on this topic published before and after the pandemic and observe the effects of teleworking and COVID-19. This periodic literature review enables a better understanding of the study objectives and methods.

2.2 Pre-Pandemic Literature

Previous literature has presented many benefits of teleworking to employers and employees in terms of job effectiveness (Grant et al.,2013). Employers who implement teleworking in their facilities achieve increased satisfaction, productivity and commitment of their employees and decreased workforce geographic constraints ("Butler et al., 2007; Wheatley, 2012; Noonan & Glass, 2012"). Conversely, teleworking lowers the stress levels of employees (Karasek & Theorell, 1990).

Martin and MacDonnell (2012) used the meta-analysis method to analyse eight databases of articles and empirical studies. Telework was used as the

independent variable, and the outcomes of interest to organisations (effectiveness), namely "productivity, retention, turnover intention, commitment and performance", were used as the dependent variables. The researchers found a slightly positive correlation between telework and organisational outcomes. Telework is apparent to have positive effect on productivity, secure employees' retention, reinforce "organisational commitment and improve performance within the organisation."

Martínez-Sánchez et al., (2008) surveyed the databases of 156 firms in Spain to explore the human resources (HR) commitment and social benefits of telework adoption and firm performance. They found a positive relation between access to "HR commitment" and social benefits, intensity of adopting teleworks and firm performance.

Other researchers have examined the practicality and strategic benefits of teleworking, aside from flexibility. Instead of focusing on the technological part only, Offstein, Morwick and Koskinen (2010) analysed the role of a creative, innovative and progressive leadership mentality, which is important for a successful teleworking experience and leadership role while managing the process. Based on personal experiences, observations and interviews with companies and government organisations in a variety of industries, the most successful teleworking experiences combined technology and leadership during the implementation of teleworking. Teleworking was adopted as a competitive advantage to overcome geographical, time and physical presence limitations.

Researchers have also examined the costs and pitfalls of teleworking. According to Pyöriä (2011), the reason for the slow post-pandemic

teleworking diffusion is the absence of founded "contractual framework" and teleworking "culture". The author addressed the problems associated with teleworking, such as individual differences and situations affecting teleworking preferences and suitability, traditional management style, resistance to change and data security issues. Nevertheless, the author also presented four main advantages of teleworking: environment friendly aspect, flexibility aspect, positive corporate image created by the teleworking option and enhanced job control and well-being at the individual level and increased overall efficiency of organisations.

Davis (2011) suggested a set of factors as vital requirements for employees of large multinational corporations and urged that managers must assess teleworkers' job performance. The social and technology factors of teleworking mainly affect two main requirements, productivity and effectiveness, which have advantages and disadvantages in results-oriented job performance.

Telework expectations may be different from the outcomes. A study conducted in the United Kingdom examined 394 employees who had experienced telework for less than 12 months (Maruyama & Tietze, 2012). The authors compared expectations before telework experience and after employees telework experience outputs reported by employers with diverse distinctives, such as "gender, job type, presence of dependent children and working hours spent at home". The study reported that the employees underestimated the positive and overestimated the negative experiences of telework before adopting it. Females reported a decrease in difficulty to handle caring responsibilities while teleworking. Moreover,

sales and marketing reported that teleworking has negatively affected career development due to the lower visibility of customers and clients.

One of the studies conducted in the Arab region, specifically Egypt, aimed to inspect the effects of "demographic, technological, individual and organizational factors on the perceived productivity of Egyptian teleworkers (Aboelmaged & El Subbaugh, 2012)". The results highlighted the need of "job security" as a key of perceived telework productivity, as well as the role of satisfaction, commitment, work flexibility and management support. Surprisingly, the effects of "the demographic factors, attitudes and technological" factors were hardly noticed.

2.3 Post-Pandemic Literature

One of the latest studies on telework effectiveness is "Promoting effectiveness of "working from home": Findings from "a Hong Kong" working population under COVID-19", Wong et al., (2020) developed an online survey questionnaire and posted on the university website during the period of 8–26 April 2020 to get views from full-time "Hong Kong workers" who had teleworking experience during "the COVOD-19 outbreak". The questionnaire was distributed via various social media channels. A

total of 2,573 responses were received. An effective response rate of 76.8% was obtained from a total of 1,976 responses.

The researchers developed questions based on a review of a wide range of literature (e.g. academic papers, industry reports, newspaper

commentaries, etc.). All measures of the study used "a five-point Likert scale", where 1 denotes "strongly disagree" and 5 denotes "strongly agree". Three measurement factors were surveyed: 1) personal and family well-being measured by six items, 2) environmental constraint measured by five items and 3) resource constraint measured by two items. The control variables used were gender and age to accurately measure the factors. These factors were tested during the COVID-19 pandemic and compared with the post-pandemic results of previous papers and reports.

The researchers used regression analysis. Based on the data collected from 1,976 Hong Kong employees, they concluded that family well-being and telework effectiveness improved because of teleworking. Moreover, environmental and resource constraints reduced the effectiveness of teleworking. Females and employees with better teleworking arrangements tended to prefer teleworking more than others. In terms of task and occupation, frontline and middle-grade workers showed a higher preference for teleworking than management-level employees and self-employed individuals.

Feng & Savani (2020) published in September 2020 their research on one of the demographic factors affecting telework productivity and effectiveness entitled "COVID-19 created a gender gap in perceived work productivity and job satisfaction: Implications for dual-career parents working from home". This paper examined the gender gap in the work-related outcomes of teleworking during "the COVID-19 pandemic". The authors hypothesised that the perceived productivity and job satisfaction of teleworking during the "COVID-19 pandemic" would make a gender gap.

They found that the effect of the pandemic would extend to schoolchildren and that they would also be at home the whole day during the teleworking hours of their parents. Women were expected to dedicate more time to housework and childcare.

The above study was conducted between April 15, 2020 and May 4, 2020, which was the lockdown period instituted in most areas of the United States and when telework practice was implemented. The authors posted a survey on Amazon's Mechanical Turk, which is an appropriate source for demographically diverse participants. The survey targeted 300 US-resident and full-time family employees who were living together, employed full-time before and during the pandemic and working from home at the time of the study.

A total of 286 usable responses were examined. The variables were gender, number of children (control variable), perceived work productivity before and during COVID-19 and job satisfaction before and during COVID-19. Perceived work productivity was captured using Riordan and Shore's (1997) work group productivity scale, with modifications, to assess individual work productivity. Job satisfaction was measured using a four-item scale developed by Spector (1997).

The results showed that the pandemic made "a gender gap" in perceived "work productivity and job satisfaction". Women who reported similar work productivity and job satisfaction to men before the pandemic were less productive and less satisfied with their jobs than did men after the outbreak.

Belzunegui-Eraso and Erro-Garcés (2020) presented a theoretical standpoint in their study entitled 'Teleworking in the context of the COVID-19 crisis' published on 1 May 2020. The article contributed in providing literature on four main areas: 1) new factors affecting the implementation of teleworking, 2) extension of Baruch and Nicholson's framework by adding environmental factors, 3) development of a database of companies that have introduced telework as a measure to face the pandemic in a crisis context and 4) testing of the extended model on the database as a quantitate addition to the article.

Baruch and Nicholson (1997) developed a framework based on a semi-structured survey of 62 teleworkers in five UK organisations. They found four factors associated with telework: individual, job, organisational and family/home. The authors suggested that these factors should be fulfilled and nurtured to obtain useful teleworking outcomes.

Individual factors are captured by two approaches: qualitative based on preference reported and quantitative based on performance reports. The approaches suggest for whom employees can telework effectively. For example, a study in California concluded that "education, age and race" were all "statistically significant" in clarifying teleworker behaviour. A study by the Chicago Regional Household Travel Inventory examined other variables, such as gender, children in the household and fully flexible work-related schedules. The study found that employees in the real estate, rental or leasing occupations were more likely to telework. The results regarding the effects of transport and work location on teleworking were also discussed. In terms of organisations, the researchers found that those

in higher technology-reliant and knowledge-oriented jobs tended to suit teleworking more than others.

The authors of "Teleworking in the context of the COVID-19 crisis" extended "Baruch and Nicholson's framework" by combined environmental, safety and legal factors. The "COVID-19 pandemic" forced researchers to study the effect of the association between safety and regulation, as most governments encouraged teleworking practice in the private sector, and some implemented mandatory teleworking in the public sector, such as employees safety problems, "citizens emanating from natural disasters, terrorist attacks, or health alert alarms."

Data were collected during the peak of the pandemic from European companies in the period of 1–16 March 2020. For companies that adopted teleworking either fully or partially, some had previously implemented teleworking strategies. Data were analysed using a configurational method in terms of not symmetric hypothesis. The results showed that teleworking after the pandemic for business going depended heavily on the actions of the organisation, and that it was diverse among acttions. Several companies adapted their measures as the diffusion of "COVID-19" increased, following "the health authorities" recommendations" from every country. As a result, initial estimations of the environmental impact of the crisis were published. As Myllyvirta, (2020) mentioned in the article Analysis: Coronavirus tentatively reduced "China's CO2 emissions" by a quarter published in Carbon Brief website Global Carbon Project highlighted a reduction in the world's GDP caused a carbon dioxide emission to decrease. The majority of collective bargaining agreements contain special

teleworking clauses. These provisions view the practice of teleworking as one that is both revocable and voluntary for the worker and the employer in question.

Nakrosiene et al. (2019) published a study entitled 'Working from home: Characteristics and outcomes of telework' on 1 April 2019. One of the latest studies prior to the COVID-19 pandemic, it aimed to test the theoretical factors of teleworking and its outcomes at the individual and organisational levels.

The authors explained the teleworking concept by studying a set of teleworking definitions from past literature in terms of telework intensity, frequency, time and place. The well-grounded definition of teleworking was expanded to encompass 10 teleworking characteristics and their effects on the result of the work.

"Job demands–resources theory (Demerouti et al., 2001)" has been used to estimate the effects of several telework variables on work outputs. Previous literature has identified "time-planning skills" as an important factor in increasing autonomy to enhance work satisfaction, leading to higher employee productivity, especially in families with young children. As there are teleworkers who work longer hours than those in the usual work setup, working at peak efficiency hours plays a measurement role in telework effectiveness. Time-planning skills are important because of their role in decreasing time pressure and enhancing satisfaction and productivity in telework.

Possibility of working during the suitable a productive time. This variable is closely connected to the flexibility of teleworking. Teleworkers could choose their most productive time and have greater control over work situations.

Supervisor's support and trust. As highlighted in previous literature, teleworking causes lower visibility with supervisors and the possibility of decreased supervisor's support. Teleworkers have to establish a trusting relationship between co-workers and supervisors to have a positive telework experience.

Less time for communication with others. Despite the disadvantages of "social isolation and a lack of communication" in teleworking, the reduced time for communication with co-workers introduces another time resources, produce "higher productivity."

Possibility of taking care of members of family. Being able to beware of "children, parents and other family members" and deal with family-related issues is an important asset for teleworkers and that gives a good work outputs.

Possibility of working from home in case of sickness. This factor is valuable for individuals who would like to achieve their work commitments under any conditions.

Suitability of the work area at home. A dedicated space, noise and temperature play a role in teleworkers' productivity and satisfaction.

Possibility of accessing the organisation's documents from home. Workers with appropriate technological access to their organisation's documents have a greater opportunity for a successful teleworking experience than those with poor technology access and resources.

Possibility of saving on travel expenses. Previous research has found that time and cost savings can increase teleworkers' productivity and satisfaction.

Gender. Researchers have found that telework is more valued by women and that it increases career opportunities through the ability to back to work earlier after "maternity leave."

Number of children. The authors assumed that teleworkers having children are more satisfied with telework because of reduced costs and responsibilities.

A web-based survey was distributed by the HR departments of "IT, insurance and telecommunications companies in Lithuania that have telework programs". A total of 128 responses were obtained. Ten telework factors as predictors variables were "measured on five-point Likert scale items". The dependent variable of telework outcomes was gauged as well. Age was treated as the control variable, as older workers might value the flexibility and comfort of telework arrangements more, and younger workers might value the free arrangements more.

The study results are consistent with previous research, as they provide empirical examples of the telework factors' effects and outcomes.

Many studies have evaluated the factors of teleworking, and some have gone in detail in evaluating telework outcomes, such as telework–work interference of the family and supervisors' control of teleworkers' performance.

Solís (2017) conducted a study entitled "Moderators of telework effects on the work–family conflict and on worker performance". Data were collected in September and October 2014, and the study was published in February 2017. The author developed his hypotheses from previous studies on the relationship between increased family responsibility and positive telework outcomes (Shockley and Allen, 2007). Madsen's (2011) literature review referenced many studies with evidence of teleworking lowering the stress of families with children.

The second set of hypotheses discussed the interaction between supervisor control and telework in work performance. The authors found a respectable number of studies about supervisors' control level and support in determining telework success (Kowalski & Swanson, 2005; Dimitrova, 2003).

The authors interviewed 92 teleworkers and "72 non-teleworkers" from "four public institutions". The teleworkers and non-teleworkers worked in the same department and performed similar tasks. The authors also interviewed 33 supervisors to evaluate the same group's performance.

To analyse the results, hierarchical "linear regression analysis models" were obtained to estimate the effect of telework on the factors. The results showed that at the "low-responsibility level", "teleworkers" presented

lower family interference with work than "non-teleworkers". Conversely, with "high levels of responsibility", teleworkers showed higher family interference with work. Finally, a negative relationship was found between supervisors' control of teleworkers and their proactivity and adaptability to tasks.

Solís, M. S. (2016). conducted a study entitled "Telework: conditions that have positive and negative impacts on the work–family conflict".

Published in July 2016, the study investigated "the positive and negative effects of telework on work–family conflict". The factors and conditions examined were the used area quality employee uses when teleworking from his or her home, the presence of other persons at home while a person is working, the frequency of teleworking (Number of Days), the flexibility to create a suitable timetable for teleworking, teleworkers responsibilities outside his or her work environment (social and personal tanks and responsibilities) and the volume of time consumed teleworking.

Costa Rican public institutions provided the authors with data on 184 teleworkers. A total of 142 teleworkers were interviewed by sending them an email containing an invitation link to the questionnaire. Reminders were sent to ensure the maximum number of responses. The author used three multiple linear regression models to test his hypothesis.

2.4 Milestones of Pre and Post Pandemic Literature

It is remarkable that post-pandemic teleworking effectiveness factors literatures was in line with pre-pandemic literatures. Most recent studies such as "Work from Home during the COVID-19 Pandemic—The Impact

on Employees' Self-Assessed Job Performance" published on 2022 examined impact of the variables belonging to the employee's profile, organizational environment, and work-life balance categories on social and technical performance. Results showed that Job autonomy, engagement, communication skills, trust in co-workers, occupational self-efficacy, and family-work conflict, significantly influence both social and technical (Kifor et al., 2022).

According to Ahmad, et al. (2022) examination of teleworking utility to achieve work-life balance by surveying 621 employees using qualitative data method. Findings was that Work performance and personal well-being identified as work from home outcomes, on the other hand emotional support identified as facilitating conditions.

Despite the fact of using consistent teleworking effectiveness factors, recent researches such as "Does lack of social interaction act as a barrier to effectiveness in work from home? COVID-19 and gender" published on 2022. The study investigated the influence of lack of social interaction in work from the home arrangement on employee work effectiveness. Findings of the study spotted the light on negative effect of lack of social interaction while teleworking during COVID-19 lock down.

To conclude, measures and factors of telework effectiveness was consistent throughout COVID-19 pandemic. However, literatures findings was controversial prior to the pandemic at it is post pandemic.

2.5 Concluding Remarks

Gaps in the literature can still be found, despite the number of remarkable studies examining telework and the quantitative and qualitative approaches used by researchers. According to Beauregaret al., (2019), the two main areas that require further study are the effects of "telework on employees extra-role performance and organisations succession planning."

When teleworking was introduced as a 'special' arrangement, the number of teleworkers was smaller than that of conventional workers. Teleworkers show citizenship behaviours when they receive special arrangements from their managers and organisation. Conversely, if telework is widely used, or, for example, if COVID-19 is used as a reason to comply with government regulations, teleworkers are probable to observe such an preparation as "customary or normative (Canonico, 2016)".

In organisations' succession planning, the literature has shown that telework can lower employee visibility and the ability to share knowledge between co-workers and limit career opportunities to some extent (Cooper & Kurland, 2002). Teleworkers may refuse promotions that require more attendance at the office, which may create problems in succession planning (Canonico, 2016).

Chapter Three : Theoretical Framework and Hypothesis

3.1 Introduction

Most of the variables of telework effectiveness and productivity can be explained by "Self-efficacy theory refers to an individual's belief in his or her capacity to execute the behaviours necessary to produce specific performance achievements (Bandura, 1977, 1986, 1997)." Teleworkers should have high self-efficacy to perform a high level of effectiveness and productivity while teleworking.

High or low self-efficacy comes from four main sources. First, mastery experiences are personal experiences of success, and they are referred to as teleworker characteristics (Yeh et al., 2019). Second, vicarious experiences of social models are explained through the communication of knowledge transfer during teleworking. Third, social persuasion is exposure to others' verbal and non-verbal judgments, which can be positive or negative, similar to other sources of self-efficacy (Britner & Pajares, 2006). Third, management characteristics are examined at will to evaluate their effects on telework effectiveness and productivity. Fourth, the physiological and emotional states of teleworkers, in the context of the current study, greatly affect teleworking and pandemic characteristics.

3.2 Research Variables and Hypothesis

3.2.1 Job effectiveness

"Job effectiveness is defined as the evaluation of the results of an employee's job performance' (Jex, 1998)". Effectiveness is defined as the capacity to carry a 'successful outcome and meet objectives as fully as possible' (Davis, 2011). However, the importance factors of job effectiveness can vary between regular employees and teleworkers. The physical distance between teleworkers and their organisations creates difficulty for teleworkers to be aware of organisational values and goals (Madsen, 2003). At the managerial level, low visibility between teleworkers and managers lowers supervisor support (Cooper & Kurland, 2002). Moreover, teleworkers' competences can vary, which can greatly affect the effectiveness of telework. Study surveys (e.g. Baruch, 2000; Sullivan & Lewis, 2001) have indicated that "self-motivation, integrity, self-confidence and good communication skills are the key competencies."

3.2.2 Job productivity

Productivity refers to 'the amount of output produced in a specific amount of time' (Miller, 2008). Teleworking is one of the tools used to increase the productivity of organisational workers. Despite the advantages of telework productivity ("e.g. Butler et al., 2007; Pe´rez-Pe´rez et al., 2003; Perincherry, 2009; Rasmussen & Corbett, 2008"), the increased gains in productivity were not in parallel with the expectations because of environmental constraints ("Akyeampong, 2007; Bailey & Kurland, 2002; Belanger, 1999; Bosch-Sijtsema et al., 2010").

Social, professional and technological factors can affect telework effectiveness and productivity. In this study, we examine these factors and their relationships with telework effectiveness and productivity. To simplify the hypotheses the authors combined effectiveness and productivity concepts in to Telework Performance as a representative of both terms.

3.2.3 Demographic variables

Previous studies have shown gender differences in valuing telework (Belanger, 1999; Mokhtarian et al., 1998). Women value teleworking because they want to maintain family life and work balance. The ability to work during maternity leave can retain and increase women's career opportunities (Schreiber, 1999). However, studies have also shown a decrease in women's productivity while teleworking (Lim & Teo, 1998). Women with a decreased level of rejuvenation and a blurred work–home boundary can increase their level of stress (Hartig, et al., 2007).

Studies have suggested that married teleworkers tend to be more productive than others because of the increased role of conflict (Abdul Azeez & Supian, 1996). Moreover, families with children at home can benefit more from teleworking than families with no children (Mokhtarian et al., 1998). Demographics are used as the control variable in this study.

3.2.4 Social characteristics

The perceived advantage of the possibility of taking care of family members can positively reflect on the telework effectiveness of

teleworkers. Moreover, teleworking enables employees to combine working with dealing with family issues ("Ammons & Markham, 2004; Johnson et al., 2007").

The categories of the next three factors can be described as contributing factors to effective telework. Previous literature has thoroughly examined and tested teleworking outcomes and other environmental factors. We highlight their relationship with effective telework, as empirical studies have not yet focused on it, especially after the pandemic and with the necessity of telework.

H1: "There is a positive relationship between perceived telework performance and social factors (SOF)."

3.2.5 Job characteristics

Empirical studies have shown a negative association between teleworkers' low professional communication with co-workers and high-level task interdependence. Martinez-Sanchez et al. (2007) found a direct relationship between "teleworkers performance and work flexibility". Moreover, they highlighted the importance of telework practice as a tool for dealing with work more work and liberating themselves from fixed and "chronological work schedules", which leads to increased firm performance. On the other hand, less structured firms have the flexibility benefits the most while practicing teleworking more than structured firms (Ndubisi & Kahraman, 2005). An early study captured the benefits of changing from a hierarchical structure to a more spherical one to reflect the

role of informal communication tools and methods have become the formal method for communication network (Barrett & Turtz, 1998).

H2: "There is a positive relationship between perceived telework performance and job characteristics (JOC)."

3.2.6 Teleworker characteristics

Some researchers have examined the organisational skills and professional qualities of effective teleworkers, and the assumptions and results were generated by 'common sense'.

Many researchers have advised managers to select teleworkers based on their capability to work autonomously with little direction, the capacity to work without huge social communication and the personality characters of trustworthiness and morality ("Baruch, 2001; Harpaz, 2002"). Teleworker independence and employment flexibility have been found to be more important and preferred than technological and knowledge provisions for effective teleworking practices in "small- and medium-sized enterprises" in "West London (Clear and Dickson, 2005)". Moreover, employers have been advised to select self-disciplined, organised and motivated teleworkers to ensure a more effective teleworking practice (Mello, 2007; Raghuram & Wieselfeld, 2004).

H3: "There is a positive relationship between perceived telework performance and teleworker characteristics (TRC)."

3.2.7 Management characteristics

Researchers have established the importance of management support and trust as success factors for telework practice (Watad & Disanzo, 2000) and increasing teleworkers' productivity (Scholefield, 2008). Teleworkers' attitudes and behaviours studies established evidence of the effect of performance management system that been used by management while teleworking. For example, Virick and DaSilva (2010) found that using aims and measurable goals as objective criteria are used to gauge "performance outcomes". Managers utilize an information sharing approach while managing teleworkers have been detected to be more probable to report less work-social "life conflict", improved performance and advanced rates of helping their colleagues ("Lautsch et al., 2009"). More communication approaches connected with "better job satisfaction, output and loyalty among teleworkers include interactive job expectations in a clear and concise manner; interactive job responsibilities, goals and objectives clearly; and meeting deadlines (Ilozor et al., 2001)".

Empirical evidence of organisational training promoting teleworkers' resilience and well-being is one of the outcomes of telework effectiveness. Providing training for teleworkers covers subjects like setting up a work area at house, continuing work relation, communications and professional integrity, and time management skills, managing workload and performance. Managers needs to be trained in how to create and maintain " a work environment that supports telework (Johnson et al., 2007)".

H5: "There is a positive relationship between perceived telework performance and management (MGC) characteristics."

3.2.8 Teleworking characteristics

One of the most obvious advantages of teleworking is the reduced time and expenses of commuting to the workplace (Tremblay & Genin, 2007). This saving of time and expenses can increase employees' satisfaction and productivity. By sparing commute time, teleworkers can spend more time working than office-based employees (Baruch, 2000).

An increase in working time flexibility can provide teleworkers an opportunity to work during the most prolific time of the day. Work autonomy and planning skills are required in applying such an advantage (Tremblay & Genin, 2007).

Social isolation can give teleworkers some time to be more effective and productive. Reducing co-workers' intrusion can increase teleworkers' focus (Bailey & Kurland, 2002).

Previous studies have shown that teleworkers communicate less with their co-workers, which could affect the knowledge-sharing process (Lowry, Roberts, Romano Jr, Cheney, & Hightower, 2006). "Lautsch et al. (2009) found that teleworkers supervised with an information-sharing method were more likely to report lower work–family conflict and increased performance and were more likely to help co-workers". Evidence from researchers has shown that "telework could negatively affect knowledge transfer in organisations (Taskin & Bridoux, 2010)".

The workplace has a strong effect on employee effectiveness and health (De Croon, 2005). Bailey and Kurland (2002) found that an unsuitable workplace has a negative effect on employee effectiveness.

Teleworkers may have fears about working remotely, such as being underestimated or forgotten because of low feasibility or being out of sight ("Baruch, 2001; Gibson et al., 2002; Khalifa & Davidson, 2000").

Teleworkers' ability to access organisational resources can limit telework effectiveness and productivity (Pe´rez-Pe´rez, et al., 2003). Providing teleworkers with appropriate tools plays a main role in telework effectiveness (Cooper & Kurland, 2002; Wiesenfeld et al., 2001).

H6: "There is a positive relationship between perceived telework performance and teleworking characteristics (TGC)".

3.2.9 Crisis characteristics

Social distancing has proven effective in fighting against COVID-19. Therefore, many countries have encouraged teleworking policies to minimise virus infection among colleagues. The opportunity of working from home in case of illness is one of the most important factors (Johnson et al., 2007), and it can be considered a telework advantage, especially during the COVID-19 pandemic. First, employees who try to complete their tasks and obligations under any condition will not consider going to work in case of illness; second, teleworkers and regular employees will not be stressed about contracting infectious diseases. Crisis characteristics are the opportunity of working in case of illness and quarantine period, the

ability to work without fear of sickness and the opportunity for automation and development (technisation).

According to Barley (1997), technisation (of the workforce) 'rests on the concept of the digitisation of information' (p. 9), and created information is 'an economic good' and 'a commodity that could be created, bought, and sold'. Barley described this concept as microelectronic technologies and automation in the Industrial Revolution. Technisation includes jobs that have been reclassified based on technological advances that replace the way work was previously done. Technisation has transformed how the workforce approaches work. Technology changes creates more opportunities of effective and efficient substitute or replacement for a outdated technologies. In some cases, 'technisation pronounces the evolution of new professions or the renovation of present professions.

H6: "There is a positive relationship between perceived telework performance and crisis characteristics (CRC)."

3.3 Framework

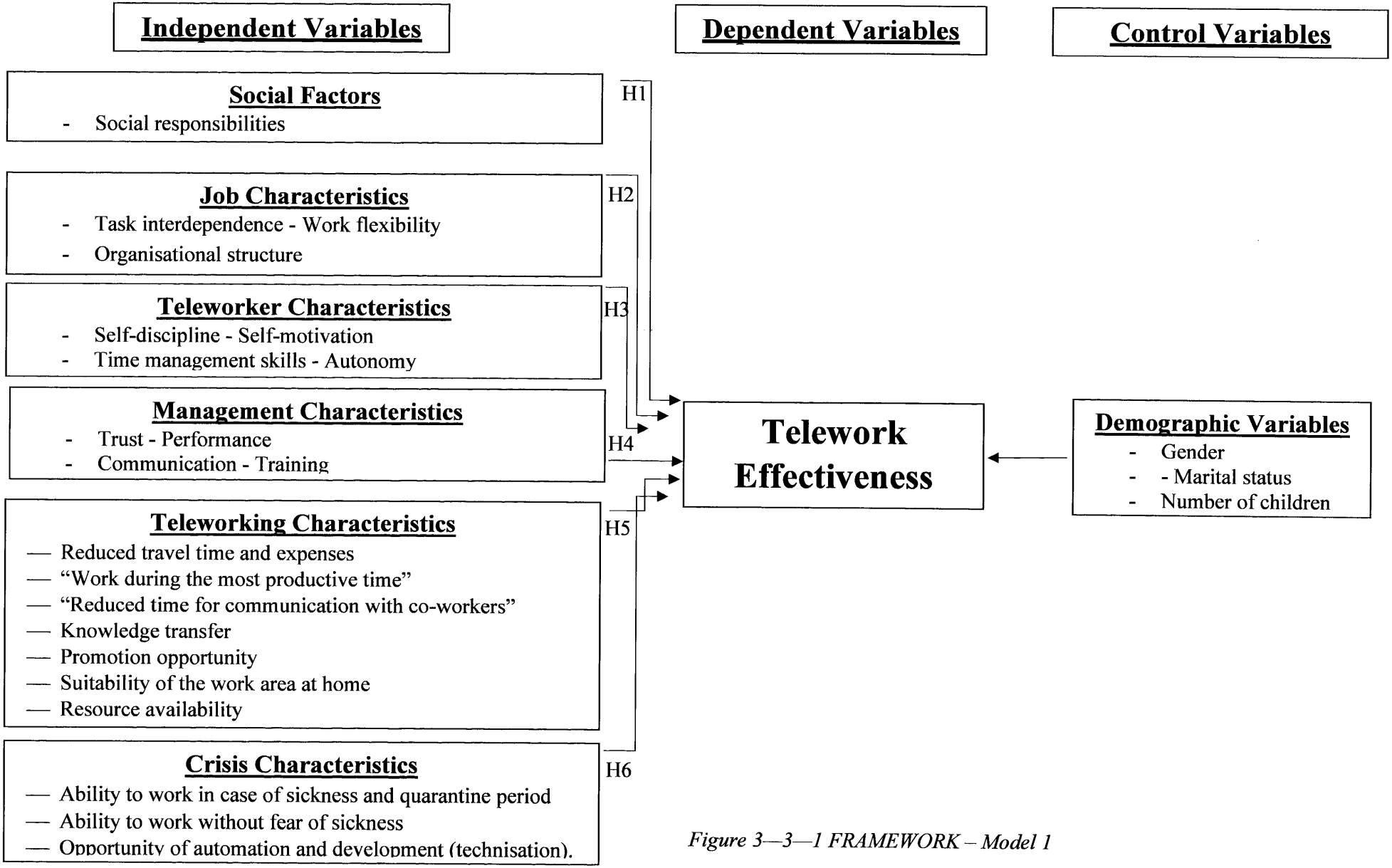


Figure 3—3—1 FRAMEWORK – Model 1

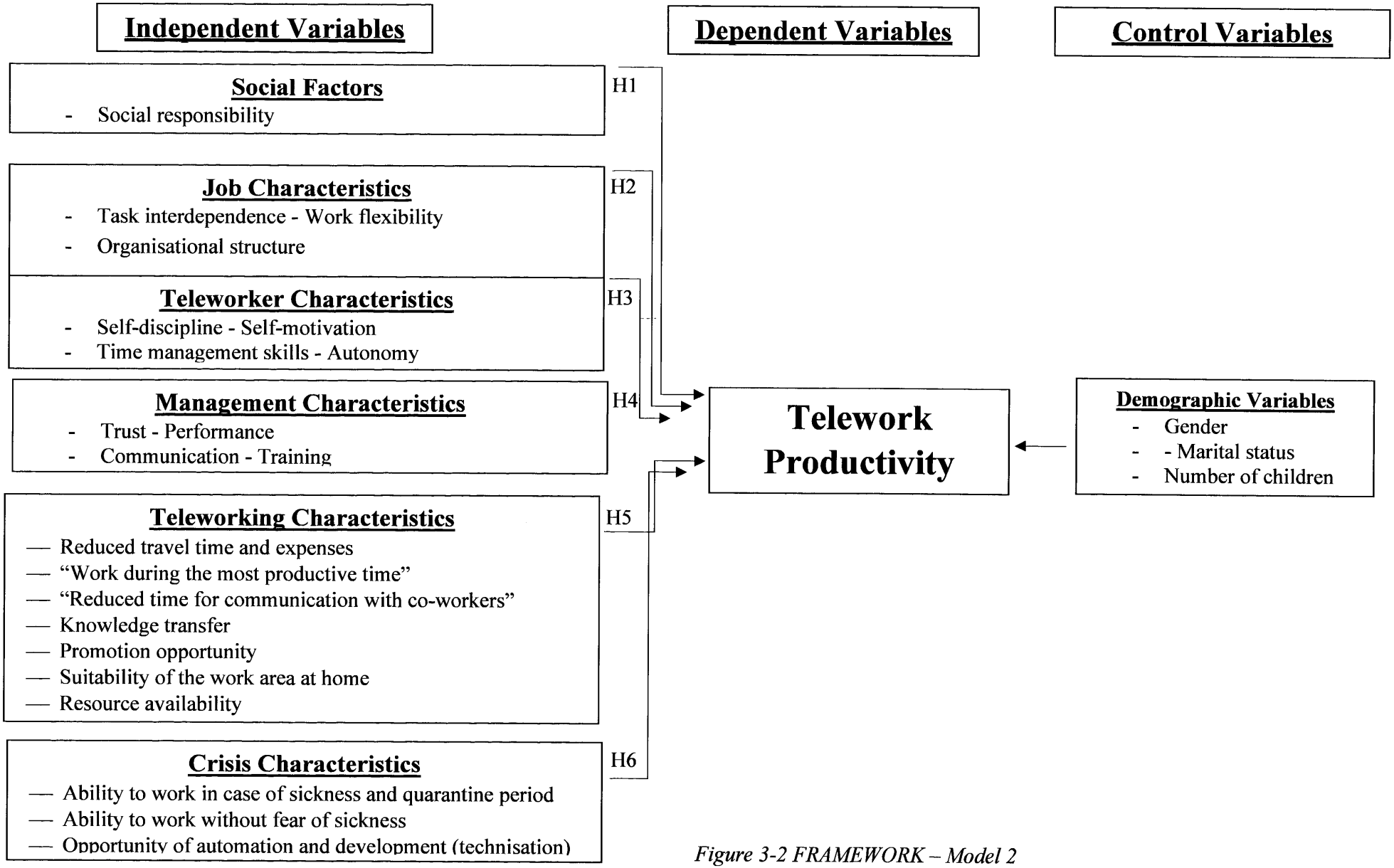


Figure 3-2 FRAMEWORK – Model 2

3.4 Summary

In this chapter, we presented the work on telework productivity and effectiveness and the social factors affecting them, as well as on the job, teleworker, management, teleworking, and pandemic characteristics. The hypotheses and variables were outlined in previous studies.

We also established the relationship between productivity of telework, effectiveness and the abovementioned factors as a framework of our study.

Chapter Four : Research methodology

4.1 Introduction

The previous chapter reviewed the literature upon which the research methodology was developed. This chapter elaborates on the methodology and the quantitative and qualitative approaches used.

The type of method and the reason for using it are explained. The population and sample, how and why the sampling process was chosen, and how it benefits the study are also discussed.

Moreover, how the questionnaire was developed and the distribution strategy are explained. The data collection process and the reliability and validity of the questionnaire are also analysed.

4.2 Study method

This research examined telework productivity and effectiveness in the Bahrain telecommunications sector. A descriptive approach was adopted to capture the relationship between telework productivity, effectiveness and the factors affecting them. The descriptive design enriches the literature and provides evidence about telework productivity and effectiveness, especially in Bahrain and the kingdom. This approach investigated the effects of social variance, the differences in teleworking stakeholders and the environmental and pandemic factors for telework productivity and effectiveness.

This study used a mixed qualitative and quantitative approach. Combining the two approaches allowed the researchers to explore the correlation between the dependent and independent variables. Moreover, it filled the gaps and processed the data completely.

Using a mixed approach by distributing a questionnaire and interviewing limited cases in depth provides personal and individual cases and experiences as well as a better understanding of the research problem (Johnson & Onwuegbuzie, 2004).

The interviews and questionnaires were conducted with employees in the Bahrain telecommunications sector. Data from the sample were analysed using partial least squares, and the hypotheses were tested.

Primary data were collected for this research. Secondary data from publications in Bahrain about teleworking and the COVID-19 pandemic were also collected and used.

4.3 Population and sample

This research targeted employees at Bahrain's telecommunications sector who could execute day-to-day tasks from home and who had practised teleworking at least once in the previous period. In this study, teleworking is referred to as performing day to day job tasks from home as an alternative of an employer's premises or and not working aboard or using telecommuting tools out of duty hours.

A random sample technique was used to collect 104 responses out of a population of 544, which were sent by the HR departments of two

telecommunications companies through email. The sample contained as many demographic types as possible.

4.4 Questionnaire

A questionnaire is a time-saving and cost-effective method of collecting large amounts of data (Creswell, 2013). The questionnaire developed based on the hypotheses and previous literature consisted of eight sections. The first section, which comprised social and demographic factors, included four close-ended questions and one question with a five-point Likert scale used to measure the variables. Each question used the following points, namely strongly agree = 5, agree = 4, moderate = 3, disagree = 2 and strongly disagree = 1, to reflect the degree of agreement or disagreement of each response to each statement. The remaining sections are job, teleworker, management, teleworking, crisis, telework productivity and telework effectiveness, which used the same five-point Likert scale.

Section 1: Social and demographic factors could affect the questionnaire and the results. The variables are directly connected to the social condition of the respondent. Gender, age, marital status and number of children were asked as close-ended questions.

Section 2: Job characteristics aim to explore the task differences and job environment variations, such as flexibility and organisational structure.

Section 3: Teleworker characteristics aim to evaluate employees' professional skills and capabilities and how they affect telework effectiveness and productivity.

Section 4: Management characteristics measure management style and approach and their effects on telework effectiveness and productivity.

Section 5: Teleworking characteristics examine the pros and cons of teleworking in terms of effectiveness and productivity.

Section 6: Crisis or pandemic characteristics examine the changes caused by the COVID-19 pandemic in terms of telework effectiveness and productivity.

Section 7: This section measures telework productivity, as reported by the respondents.

Section 8: This section measures telework productivity, as reported by the respondents.

The questionnaire was written in English first and then translated into Arabic. Thus, the respondents were given two language options to eliminate any possible language barriers. Considering the respondents' language, education level and skills when writing a questionnaire is a key factor for developing an effective questionnaire (Colosi, 2006).

An online questionnaire was generated using Google Forms. A questionnaire, whether paper or electronic, is the most frequently used tool for gathering data from respondents (Colosi, 2006). An electronic questionnaire is a time-saving and cost-effective method of collecting large amounts of data (Creswell, 2013).

A pilot test was performed by distributing the questionnaire to two employees of the HR department of one of the companies to ensure that the questions were understandable and had no technical errors.

4.5 Collecting data

The electronic questionnaire link was sent to the HR departments of Batelco and Zain, two leading telecommunications companies in the Kingdom of Bahrain. The HR department distributed the questionnaire to employees via email. The questionnaire was sent to more than 500 employees who worked from home during the COVID-19 pandemic. Three reminders from the HR department were sent to employees to encourage them to respond to the questionnaire.

The data collection process took two months, from 26 May 2021 to 26 July 2021. A total of 104 responses out of 544 population of the two companies, with a 19% response rate.

4.6 Validity of the questionnaire

The validity of a study is defined as the extent to which a concept is accurately measured (Heale, 2015). According to Heale (2015), adequate validity should have the qualities of homogeneity of the instrument, convergence of instrument and theoretical evidence to determine whether it matches the expected behaviour of the study.

The researcher adapted measures from previous studies with proven validity. The variables and questionnaire were formed to be as homogeneous as possible, and a five-point Likert scale was used to express

all variables. Moreover, the variables were integrated to form a unique but reliable model to determine the variables of telework effectiveness and productivity. All variables were adapted from well-known theories, such as self-efficacy and cognitive theory.

4.7 Interview

An interview is a qualitative data collection method used to obtain rich data with context, which may not be obtainable from quantitative data collection methods (Stofer, 2019).

The interview questions were developed from the same questionnaire questions and adapted to fit the researcher's semi-structured interview. Developing the qualitative method after the quantitative method can obtain more information using a mixed method approach (Johnson & Onwuegbuzie, 2004). Results will be reviewed in the conclusion (chapter 6).

4.8 Reliability of the research

Reliability of a study indicates the extent to which a measure is consistent (Heale, 2015). Measuring the reliability of a study accurately is difficult, but consistency and stability can be tested.

The researcher adapted the study variables and measures from previous studies and ensured that the proper research instruments were prepared before submitting them to the supervisor for advice and content analysis of the questions included in the questionnaire and the semi-structured

interview. All questions in the questionnaire were mandatory to answer before answering the subsequent questions.

The researcher conducted a pilot interview to test reliability and consistency before distributing the questionnaire to ensure that the questions and measures were clear and understandable by the respondents. The interview results matched those of previous research in terms of reliability.

	Size of population					
Margin of error	>5000	5000	2500	1000	500	200
±10%	96	94	93	88	81	65
±7.5%	171	165	160	146	127	92
±5%	384	357	333	278	217	132
±3%	1067	880	748	516	341	169

Table 4-1 Sample reliability table

Bullen P. B. (2022) provided a table of sample reliability comparing sample size to population our 104 sample out of 544 population is acceptable as per the above table.

The internal consistency of the generated questionnaire is measured by the reliability measure. The reliability measure is the principal instrument for testing the consistency for each variable since the researcher utilizes a set of questions to measure each variable. The chosen test for determining dependability is "Cronbach's Alpha."

The alpha value, which runs from 0 to 1, is the result of the reliability study; "values below 0.5 indicate low reliability, values between 0.5 and 0.7 suggest medium reliability, values between 0.7 and 0.9 indicate high dependability, and values over 0.9 indicate extremely strong reliability (Hinton, McMurray, & Brownlow, 2014)".

An Alpha score of more than 0.7 indicates good dependability, which is the acceptable range for reliability. The internal consistency of the independent variable, the dependent variable's five components, and the moderating variable is measured by the researcher. The Cronbach's Alpha coefficient for all variables is shown in Table 4.2.

Table (4.2): Variables Cronbach's Alpha Coefficient

Dimension	Notation	Cronbach's Alpha	N of Items
Social factors	SOF	.781	2
Job characteristic	JOC	.812	4
Telework	TRC	.875	4
Teleworking characteristic	TGC	.752	5
Telework effectiveness	TEF	.897	2

Note: Management, crises, and productivity have 1 item

The researcher can deduce that all dimensions are very reliable, indicating that the questionnaire has a high level of internal consistency.

4.9 Summary

The methodology of this study was established to test the hypotheses. This chapter discussed the mixed approach in detail and provided justification for its appropriateness for the study. The kind of data to be gathered, identification of the research population, sample and sample size were discussed. The population was restricted to teleworkers from the telecommunications sector in Bahrain who worked from home at least once.

The design of the interview and questionnaire, their structure and the distribution process were also explained. The data collection procedure was presented. The validity and reliability of the research method were tested.

The following chapter presents the results of the study and compares them with those of previous research.

Chapter Five : Data Analysis and Model Building

5.1 Introduction

This chapter examines the collected data using descriptive and model analyses. Demographic data are reviewed in the section on descriptive analysis. The relationship between the variables is determined using the Spearman correlation. The study variables are also presented. In the section on model analysis, the data after partial least regression and the results obtained are discussed. A model equation is developed for each model. Note that regression is performed twice. First, telework effectiveness is used as the only dependent variable; second, telework productivity is adopted as the dependent variable. Demographic data are eliminated and then used as the control variable for both models. Each hypothesis is tested for each model. The variables are ranked in terms of importance at the end of each model analysis.

5.2 Descriptive analysis

The respondents' demographic information is summarised in the following graphs and tables. The sample demographics are visualised in the following section.

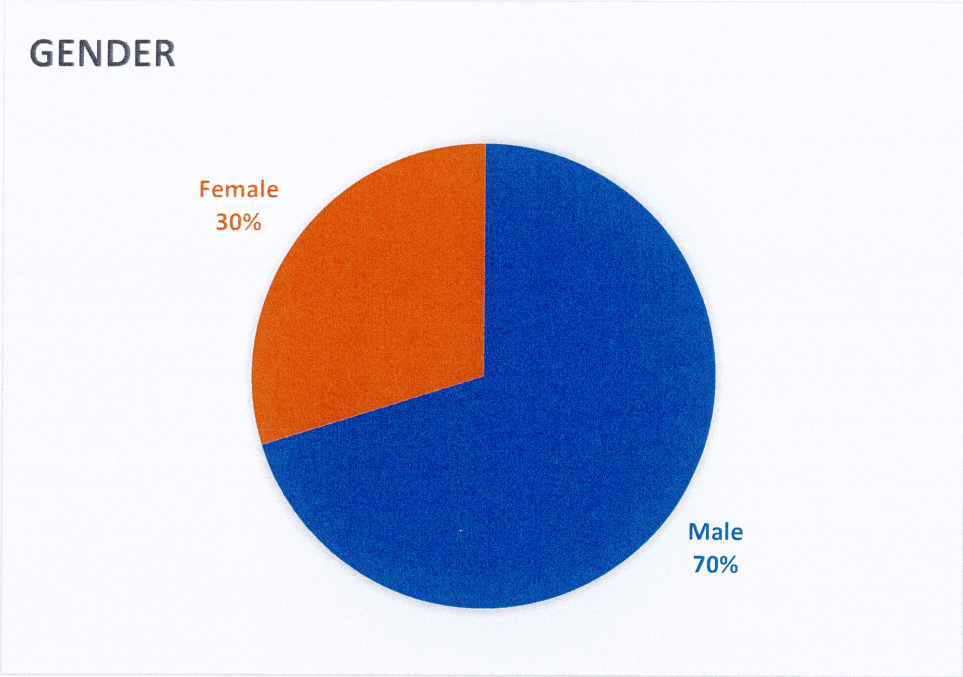


Figure 5-1 Gender

The total number of respondents was 104, with 31 (30%) female and 73 (70%) male, as shown in Figure 5-1. The majority of the sample was male, reflecting the population which contains more of males in the telecommunications sector in Bahrain due to the nature of the jobs as some requires long duty hours.

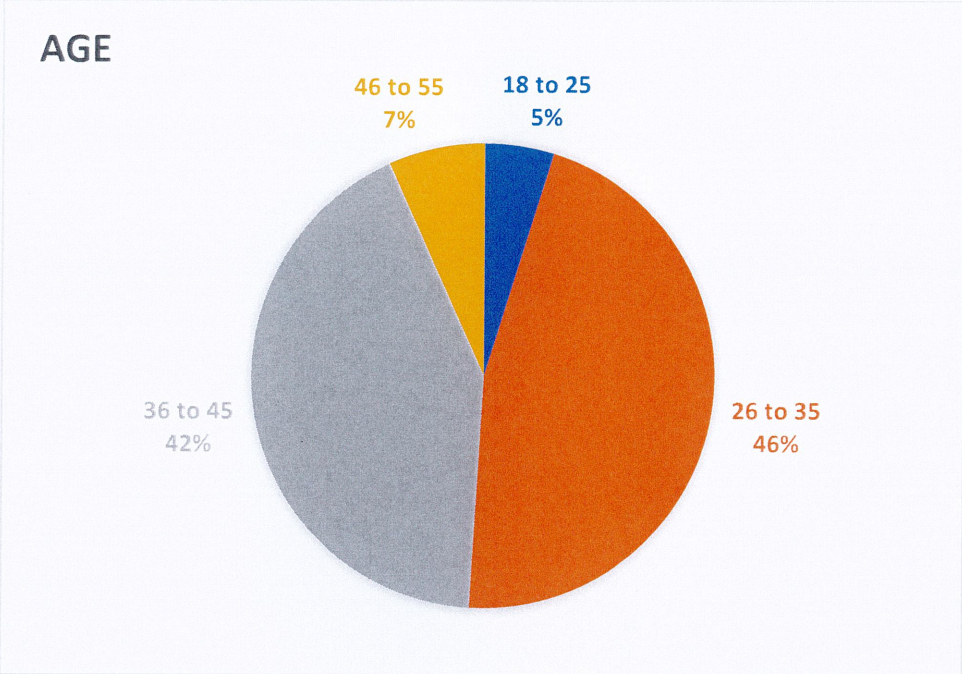


Figure 5-2 Age

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	18–25	5	4.8	4.8	4.8
	26–35	48	46.2	46.2	51.0
	36–45	44	42.3	42.3	93.3
	46–55	7	6.7	6.7	100.0
	Total	**104**	**100.0**	**100.0**	

Table 5-1 Age

In evaluating telework effectiveness and productivity, the age of the respondents and other demographics may affect the results. Most of the respondents were under the age group of 26–25 years, with 48 (46%) responses, followed by the age group of 36–44 years, with 44 (42%) responses; the age group of 18–25 years, with 5 (5%) responses; and the age group of 46–55 years, with 7 (7%) responses. Among the majority of the respondents aged 26–45, most employees obtained their bachelor's

degree at ages 22 and 23, and retirement plans played a role in this age range.

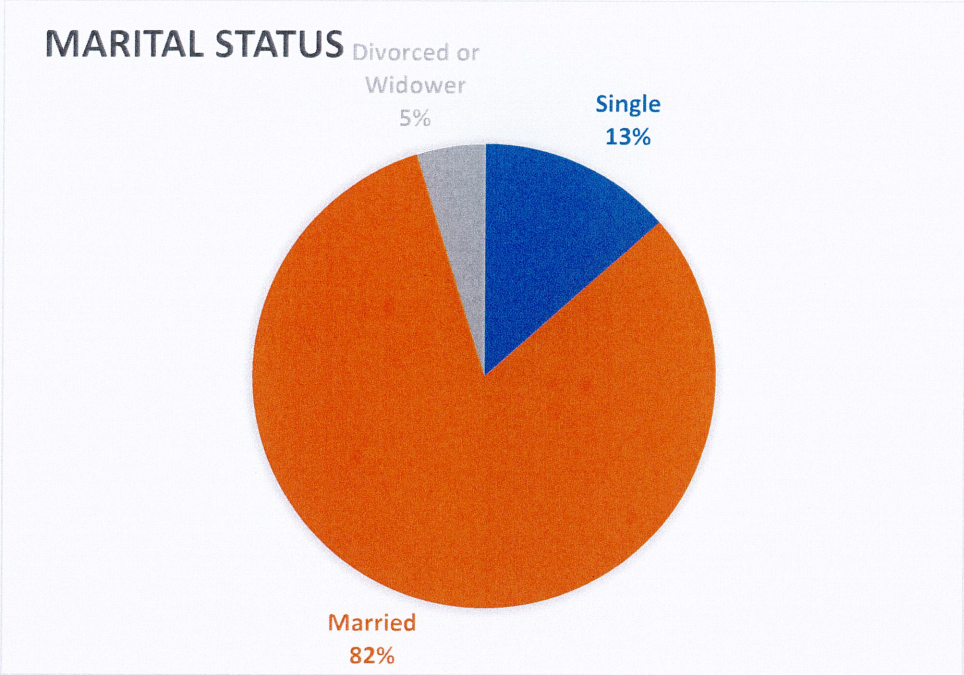


Figure 5-3 Marital status

Marital status may heavily affect family responsibilities. Among the respondents, 82 (82%) were married, 14 (13%) were single, and 5 (5%) were divorced or widower, as shown in Figure 5-3. The sample represents all marital status conditions and reflects the status of the age groups of the employees. Previous studies have found a link between marital status and telework effectiveness.

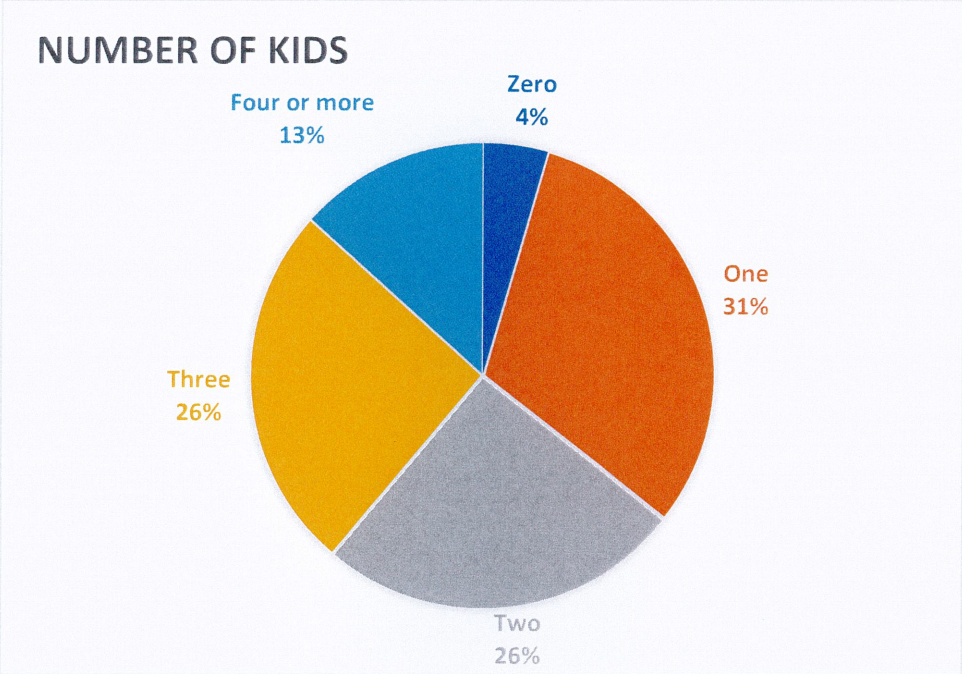


Figure 5-4 Number of children

In terms of the number of children of married respondents, 4 had no children, 28 had one child, 23 had two children, 23 had three children, and 12 had four children or more.

Table 5-2 summarises the frequency and percentage of the demographic variables

		Frequency	Percentage
Gender	Male	73	70.2
	Female	31	29.8
	Total	104	100.0
Age	18–25	5	4.8
	26–35	48	46.2
	36–45	44	42.3
	46–55	7	6.7
	Total	104	100.0
Marital Status	Single	14	13.5
	Married	85	81.7
	Divorced or Widower	5	4.8
	Total	104	100.0
Number of children	Zero	18	17.3

	One	28	26.9
	Two	23	22.1
	Three	23	22.1
	Four or more	12	11.5
	Total	104	100.0

Table 5-2 Demographic Information

Table 5-2 presents the mean, median, standard deviation, skewness and kurtosis of the study variables. The mean and median of all the variables are close to each other, with a standard deviation near 1, except for JOC and TGC. Moreover, the distribution shape of the variables (skew different from zero) is skewed for most of the variables, except JOC and TGC and light tails (kurtosis less than 3). This suggests that the normality assumption may not be satisfied and that using partial least squares is more appropriate (Helland, 1990). Table 5-3 shows the demographic information on gender, age, marital status and number of children.

VARIABLE	MEAN	STD. DEVIATION	MEDIAN	SKEW	KURTOSIS
SOF	3.663	1.204	4.000	-0.399	-0.871
JOC	3.689	0.670	3.667	-0.418	0.215
TRC	4.084	0.934	4.000	-1.266	1.667
MGC	3.788	0.834	3.875	-0.741	0.470
TGC	3.618	0.612	3.571	-0.060	0.139
CRC	4.074	0.896	4.000	-0.956	0.733
TEF	3.766	1.010	4.000	-0.573	-0.361

Std.: standard

Table 5-3 Descriptive Analysis

Table 5-3 shows the Spearman correlation coefficients of the variables. TEF has a significant correlation with SOF, JOC, TRC, MGC, TGC and CRC. The highest correlation is between TEF and TRC (0.70), followed

by between TEF and TGC (0.58). The lowest correlation is between TEF and SOF (0.28), followed by between CRC and SOF (0.31).

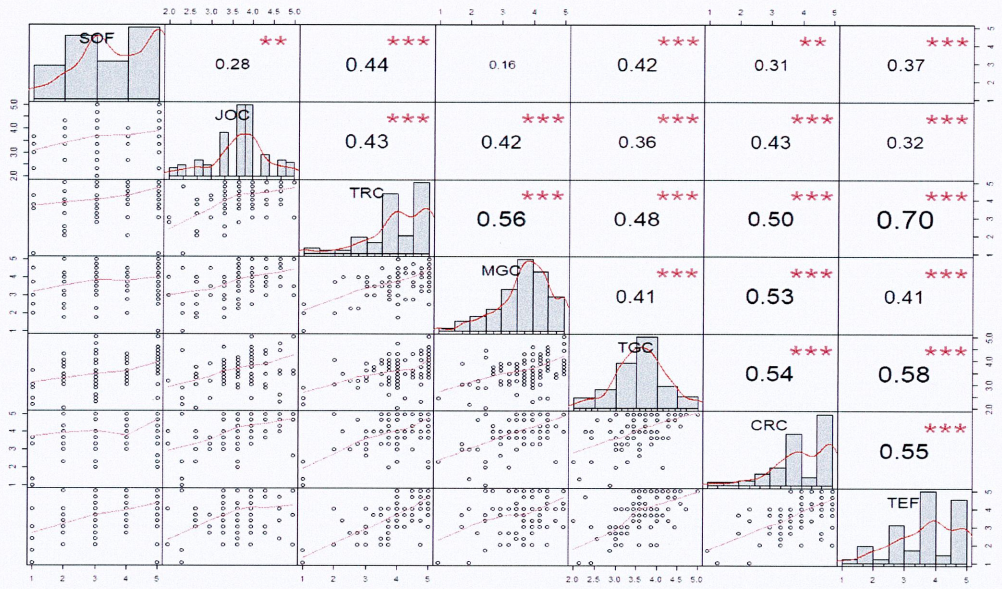


Figure 5-5 Spearman correlation and histogram of the study variables

5.3 Model analysis and hypothesis testing

Two models were implemented in this study. Model A uses telework effectiveness only as the dependent variable, while Model B uses telework productivity as the dependent variable. In each model, we first eliminated the demographic variables before considering them as factor variables.

No.	Variable	Notation	Description
1	Social factors	SOF	Taking care of family members such as children or elderly parents is the most perceived telework advantage reported in previous literature (Ammons & Markham, 2004).
2	Job characteristics	JOC	Tasks performed remotely may vary in their characteristics, such as task interdependence, work flexibility "(Sánchez, Pérez, de Luis Carnicer, & Jiménez, 2007)" and organisational structure (Ndubisi & Kahraman, 2005).
3	Teleworker characteristics	TRC	The variation of teleworker skills and professional qualities may greatly affect telework effectiveness, such as in autonomy, self-discipline, self-motivation and management skills (Clear & Dickson, 2005; Mello, 2007; Raghuram & Wiesenfeld, 2004).
4	Management characteristics	MGC	Evidence has confirmed the importance of management support and trust as success factors of telework practice (Watad & DiSanzo, 2000). Performance evaluation based on goals and measurable targets (Da Silva & Virick, 2010), communication of lower work-to-life conflict (Lautsch et al., 2009) and "training can promote teleworkers' resilience and well-being (Johnson et al., 2007)".
5	Teleworking characteristics	TGC	The well-known teleworking attributes are reduced travel time and expenses (Ndubisi & Kahraman, 2005), likely to work during the most prolific period (Clear & Dickson, 2005), decreased time for communication with co-workers (Mello, 2007), knowledge transfer, adequacy of the work area at home (Raghuram & Wiesenfeld, 2004), promotion opportunity and availability of firm resources (Watad & DiSanzo, 2000).
6	Crisis characteristics	CRC	Researchers have proven that telework can facilitate working in case of sickness, crisis or threats (Da Silva & Virick, 2010).
7	Demographic characteristics	DMC	"Gender, age, marital status and number of children" are important because of their effect on social responsibility (Nakrošienė et al., 2019).
8	Telework effectiveness	TEF	The ability to deliver a successful outcome and meet the objectives as fully as possible.
9	Telework productivity	TPR	The amount of output produced in a specific amount of time (Miller, 2008).

Table 5-4 Study Variables

5.3.2 Model A-1

Model A-1, which comprises telework effectiveness without demographic information, can be written as follows:

$$TEF = \beta_0 + \beta_1 SOF + \beta_2 JOC + \beta_3 TRC + \beta_4 MGC + \beta_5 TGC + \beta_6 CRC + E$$

The model is fitted to determine the number of Partial least squares regression (PLSR) components that should be retained by examining the lower root mean square error prediction (RMSEP) calculated using k-fold cross-validation.

	INTER	COM1	COM2	COM3	COM4	COM5	COM6
RMSEP							
CV	1.015	0.705	0.663	0.660	0.658	0.657	0.657
ADJCV	1.015	0.705	0.660	0.657	0.656	0.655	0.655
% VARIANCE EXPLAINED							
X		54.36	62.05	72.93	84.14	92.32	100
TEF		52.20	61.84	62.52	62.54	62.54	62.54
inter: intercept, com: component.							

Table 5-5 Root mean square error prediction (RMSER), cross-validation (CV) and adjusted CV (adjCV) for the Partial least squares (PLS) model

Table 5-5 shows the RMSEP and the percentage of variance explained by the components. For example, if five components are used in the model, RMSEP will be 0.657, which explains 92.32% of the variation in the independent variables and 62.54% of the variation in the dependent variables. RMSEP tends to obtain the same value after comp5. Therefore, the optimal number of components selected is five. The final regression

model can be developed using five components. The results are given in Table 5-6.

Testing of the Hypotheses Using Model A-1

	COEFF.	S. COEFF	STD. ERR.	T-VALUE	P-VALUE	95% C.I.	
INTERCEPT	-0.37					2.5%	97.5%
SOF	-0.01	-0.01	0.08	-0.13	0.89	-0.17	0.15
JOC	-0.15	-0.10	0.08	-1.24	0.22	-0.27	0.06
TRC	0.65	0.60	0.10	5.95	0.00	0.41	0.81
MGC	-0.13	-0.11	0.08	-1.36	0.17	-0.27	0.052
TGC	0.48	0.29	0.09	3.10	0.00	0.11	0.48
CRC	0.20	0.17	0.09	1.85	0.05	0.00	0.37

Coeff: coefficients, S. Standardized, Std: standard, err. Error, C.I: Confidence interval

Table 5-6 PLSR FIT TEF MODEL A-1 (NCOMP = 5)

In Table 5-6, the hypotheses are tested using the level of significance of each variable by comparing the p-value and the significance level (0.05). Therefore, H3a (p-value = 0.000 < 0.05), H5a (p-value = 0.002 < 0.05) and H6a (p-value = 0.05 = 0.05) are accepted because they are statistically significant in telework effectiveness. Conversely, H1a, H2a and H4a are rejected because they are not statistically significant in telework effectiveness.

Importance of the variables in Model A-1

To assess the 'relative importance' of the PLSR model, the information in each variable was evaluated by its 'variable importance' in the projection (VIP) (Jex, 1998; Janes et al., 2008; Chong & Jun, 2005; Mehmood, Sæbø, & Liland, 2020).

$$VIP = \sqrt{\frac{K \sum_{n=1}^{N} w_{nk}^2 SS_n}{\sum_{n=1}^{N} SS_n}}$$

K: the total number of independent variables, w_{nk}: the weight of the kth variable for the PLSR n component, N: all PLSR components and SS_n: the sum of the squared explained by the PLSR n components. Specifically, VIP is a measure of each variable's contribution based on the variation explained by each component of PLSR.

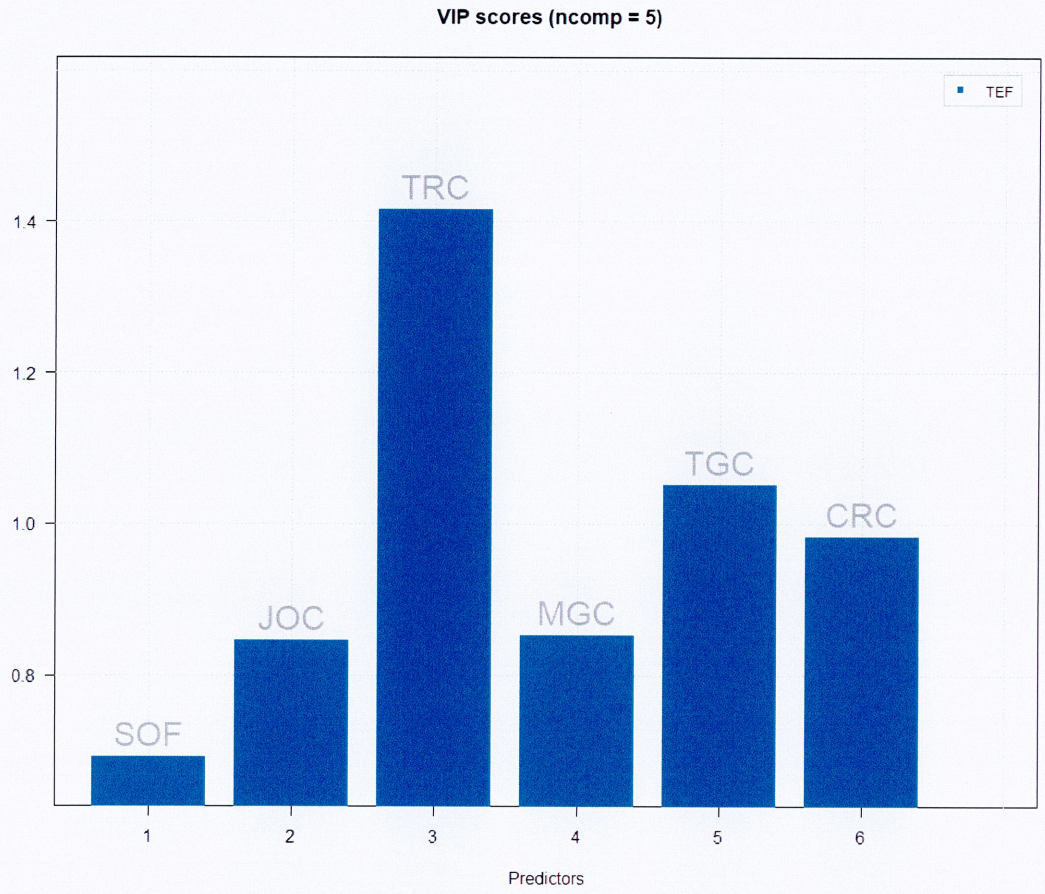


Figure 5-6 VIP Scores (ncomp = 5)

Figure 5-6 presents the important variables for the TEF model. The most important variables are near and greater than one. Therefore, the most

important variables are TRC, TGC and CRC. These results are consistent with those in Table V.

The result reinforced by the literature on TRC (Beauregard, et al., 2019; Mello, 2007; Raghuram & Wiesenfeld, 2004) is that managers must choose teleworkers based on qualities and special characteristics, such as autonomy, self-discipline, self-motivation and time management skills. Moreover, TGC, such as reduced travel time and expenses, likely to work during the most prolific period, reduced time for communicating with co-workers, knowledge transfer, adequacy of the work area at home, promotion opportunity and availability of firm resources, remained as important as they were in previous research (Nakrošienė, et al., 2019). As an extension, other methods, such as machine learning and simulation (Mousa et al., 2021; Elamir, 2013), can be utilised to make comparisons. Note that the analysis in this study was conducted using R-software, specifically the 'pls' and 'mdatools' packages (Pesántez et al., 2021; Kucheryavskiy, 2020).

5.3.3 Model A-2

Model 2, which comprises telework effectiveness with demographic information, can be written as follows:

$$TEF = \beta_0 + \beta_1 SOF + \beta_2 JOC + \beta_3 TRC + \beta_4 MGC + \beta_5 TGC + \beta_6 CRC + \beta_7 GE1 + \beta_8 AG + \beta_9 MS + \beta_{10} KI + \beta_{11} CRC + E_2$$

where AG means age, MS means marital status and KI means number of children.

The results of this model are presented in Table VI. Gender, age, marital status, and number of children are considered factor variables. Therefore, each variable appears in Table 5-7 with a coefficient equal to the number of categories minus 1. For example, as gender has two categories, it has one category in the table (Höskuldsson, 1988; Helland, 1990; Abdi, 2003).

	COEFF.	S. COEFF	STD. ERR.	T-VALUE	P-VALUE	95% C.I.	
INTER.	-0.23					2.5%	97.5
SOF	-0.01	-0.01	0.089	-0.13	0.89	-0.18	0.16
JOC	-0.16	-0.10	0.100	-1.07	0.28	-0.30	0.09
TRC	0.70	0.64	0.114	5.65	0.00	0.42	0.87
MGC	-0.14	-0.11	0.104	-1.10	0.27	-0.32	0.09
TGC	0.48	0.29	0.120	2.44	0.01	0.05	0.52
CRC	0.19	0.16	0.117	1.42	0.16	-0.06	0.39
GE1	0.05	0.02	0.076	0.33	0.74	-0.12	0.17
AG1	-0.20	-0.04	0.103	-0.40	0.68	-0.24	0.16
AG2	-0.16	-0.08	0.069	-1.18	0.24	-0.21	0.05
AG3	-0.09	-0.04	0.073	-0.64	0.52	-0.19	0.09
MS1	-0.15	-0.05	0.101	-0.51	0.61	-0.25	0.15
MS2	-0.11	-0.04	0.073	-0.57	0.57	-0.18	0.10
KI1	0.13	0.048	0.134	0.36	0.71	-0.21	0.31
KI2	-0.10	-0.04	0.079	-0.55	0.58	-0.19	0.11
KI3	0.09	0.03	0.073	0.51	0.61	-0.10	0.18
KI4	-0.15	-0.06	0.078	-0.78	0.43	-0.21	0.09

Inter.: Intercept, Coeff: coefficients, S. Standardised, Std: standard, err. Error, C.I.: Confidence interval

Table 5-7 PLSR FIT TEF MODEL 2 (NCOMP = 5)

No variables from the demographic information are significant at 0.05 and 0.10.

The hypotheses are tested in Table 5-7. H3a (p-value = 0.000 < 0.05) and H5a (p-value = 0.001 < 0.05) are accepted because H3a teleworker and H5a teleworking are statistically significant. The remaining hypotheses (H1a, H2a, H4a and H6a) are rejected because they are statistically insignificant.

5.3.4 Model B-1

Model B-1, which comprises productivity analysis without demographic information, can be written as follows:

$$TPR = \beta_0 + \beta_1 SOF + \beta_2 JOC + \beta_3 TRC + \beta_4 MGC + \beta_5 TGC + \beta_6 CRC + E$$

Similar to Model A-1, the model is fitted to determine the number of PLSR components that should be retained by examining the lower RMSEP calculated using k-fold cross-validation.

RMSEP	(INTERCEPT)	COMP1	COMP2	COMP3	COMP4	COMP5	COMP6
CV	0.8533	0.6387	0.6136	0.607	0.6049	0.6048	0.6049
ADJCV	0.8533	0.638	0.61	0.6042	0.6023	0.6022	0.6023
	%	VARIANCE	EXPLAINED				
		COMP1	COMP2	COMP3	COMP4	COMP5	COMP6
X		54.35	61.74	73.52	83.66	91.73	100
TPR		46.82	56.2	56.71	56.74	56.75	56.75
Coef with C.I							

Table 5-8 RMSEP cross-validated using 10 random segments

Table 5-8 shows the RMSEP and the percentage of variance explained by the components. For example, if five components are used in the model, the RMSEP will be 0.6048, which explains 91.73% of the variation in the independent variables and 56.75% of the variation in the dependent variables. The RMSEP tends to obtain the same value after comp5. Therefore, the optimal number of components selected is five. The final regression model can be developed using five components. The results are presented in Table 5-9.

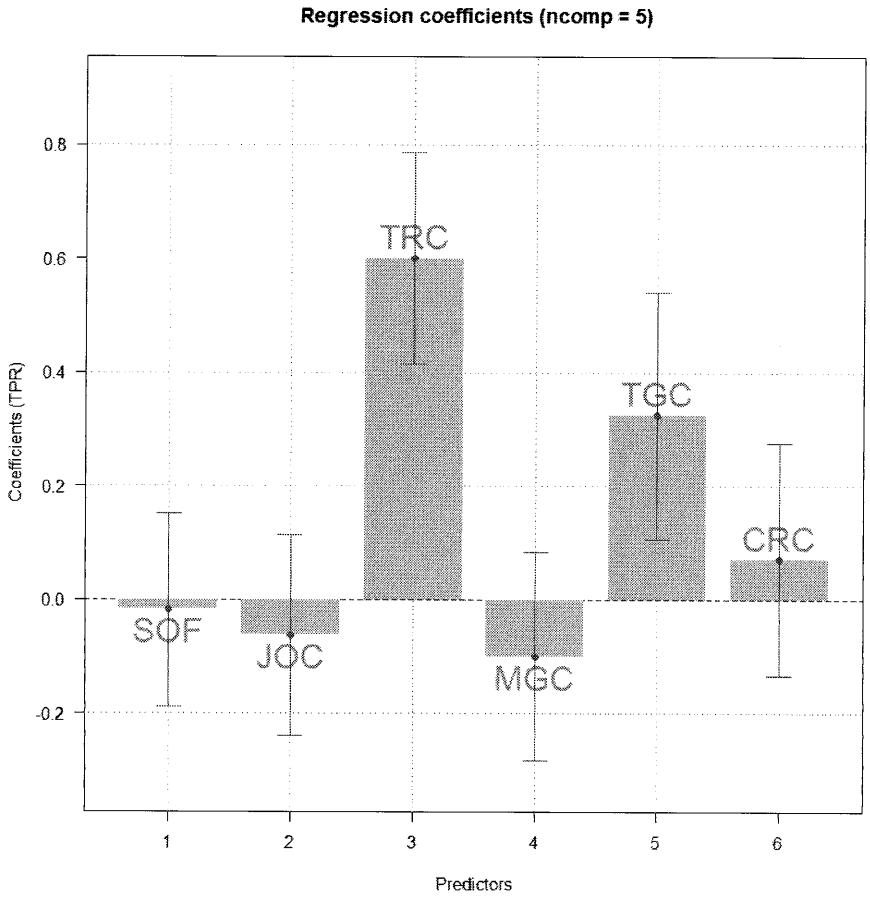


Figure 5—7 PLSR FIT TPR MODEL B-1 (NCOMP = 5)

	COFF.	COEFFS	STD. ERR.	T-VALUE	P-VALUE	2.50%	97.50%

INTERCEPT	0.024						
SOF	-0.013	-0.018	0.086	-0.210	0.834	-0.188	0.152
JOC	-0.080	-0.063	0.089	-0.710	0.479	-0.239	0.113
TRC	0.545	0.600	0.094	6.400	0.000	0.414	0.786
MGC	-0.101	-0.100	0.092	-1.080	0.284	-0.283	0.084
TGC	0.449	0.324	0.110	2.950	0.004	0.106	0.541
CRC	0.067	0.070	0.103	0.680	0.496	-0.134	0.275

Table 5-9 PLSR FIT TPR MODEL B-1 (NCOMP = 5)

The hypotheses are tested in Table 5-9 using the level of significance of each variable by comparing the p-value and the significance level (0.05). Therefore, H3b (p-value = 0.000 < 0.05) and H5b (p-value = 0.002 < 0.05) are accepted because they are statistically significant in telework effectiveness. Conversely, H1b, H2b, H4b and H6b are rejected because they are not statistically significant in telework productivity.

Importance of the variables in Model B-1

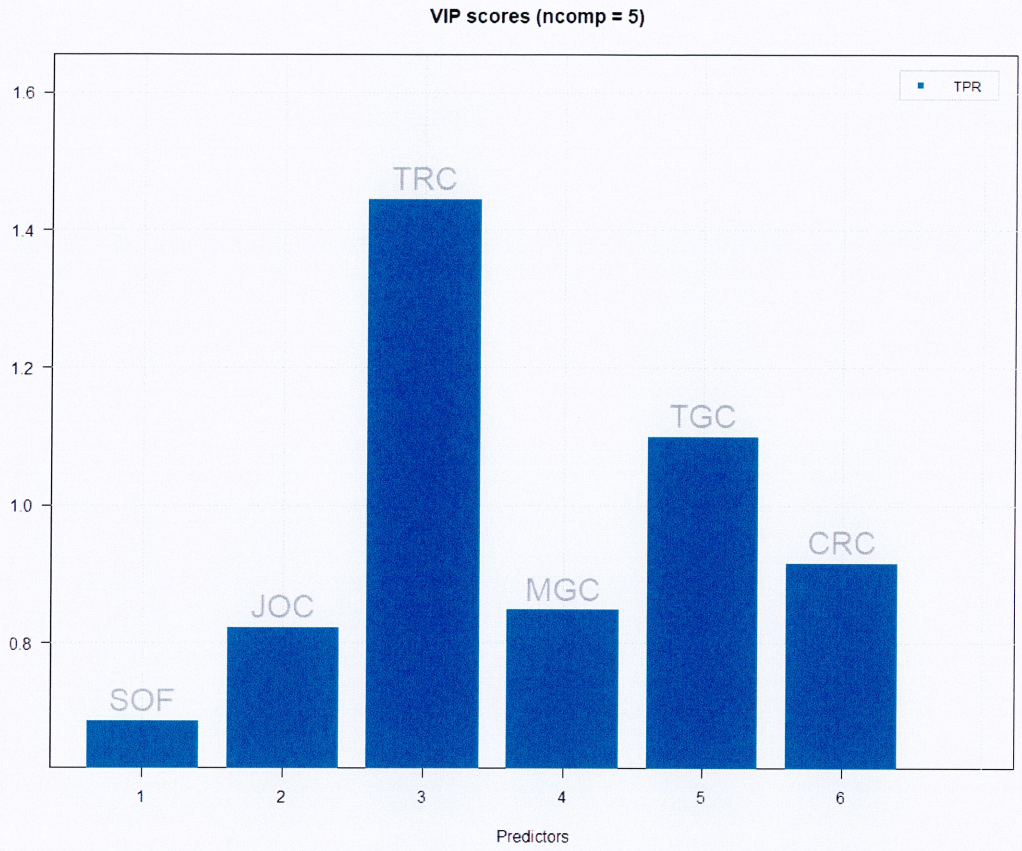


Figure 5—8 VIP Scores (ncomp = 5)

Figure 5-7 shows the important variables for the TPR model. The most important variables are near and greater than one. Therefore, the most important variables are TRC and TGC. These results are consistent with those in Table 5-9.

The results agree with the literature on TRC and TGC. Teleworker commitment affects telework productivity (e.g. Carver & Candela, 2008; "Hunton & Norman, 2010; Meer & Ringdal, 2009; Westover et al., 2010). The literature on the flexibility of telework is also aligned with the results (Cooper & Kurland, 2002; Lim & Teo, 2000; Martinez-Sanchez et al., 2007)".

5.3.5 Model B-2

Model B-2, which comprises productivity analysis with demographic information, can be written as follows:

$$TPR = \beta_0 + \beta_1 SOF + \beta_2 JOC + \beta_3 TRC + \beta_4 MGC + \beta_5 TGC + \beta_6 CRC + \beta_7 GE1 + \beta_8 AG + \beta_9 MS + \beta_{10} KI + \beta_{11} CRC + E$$

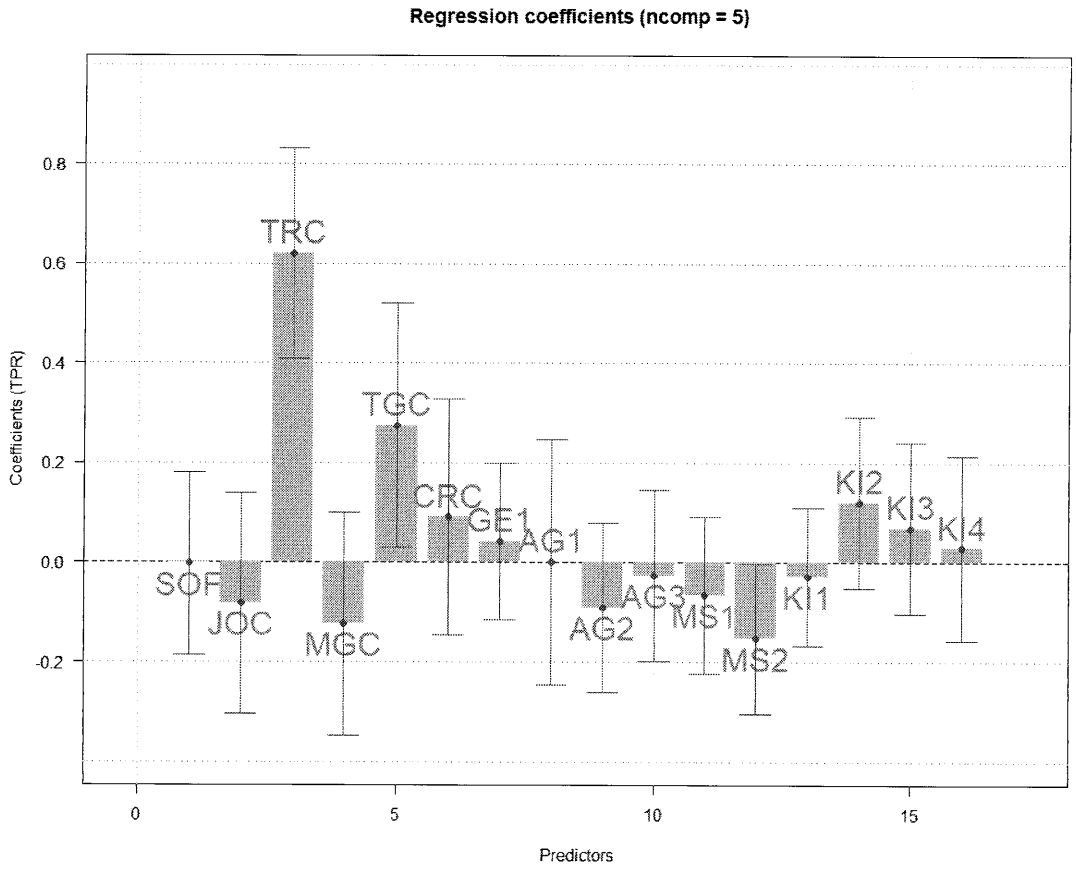


Figure 5—9 PLSR FIT TPR MODEL B-1 (NCOMP = 5)

	COFF	COEFFS	STD. ERR.	T-VALUE	P-VALUE	2.50%	97.50%
INTERCEPT	0.486						

SOF	-0.001	-0.002	0.093	-0.020	0.982	-0.186	0.182
JOC	-0.104	-0.082	0.112	-0.730	0.466	-0.304	0.140
TRC	0.564	0.620	0.106	5.850	0.000	0.410	0.830
MGC	-0.126	-0.124	0.113	-1.100	0.275	-0.347	0.100
TGC	0.381	0.274	0.124	2.220	0.029	0.029	0.520
CRC	0.086	0.091	0.119	0.760	0.447	-0.146	0.328
GE1	0.079	0.043	0.079	0.540	0.589	-0.115	0.200
AG1	0.004	0.001	0.124	0.010	0.993	-0.245	0.247
AG2	-0.154	-0.091	0.086	-1.060	0.291	-0.260	0.079
AG3	-0.044	-0.026	0.087	-0.300	0.767	-0.197	0.146
MS1	-0.162	-0.066	0.080	-0.830	0.411	-0.224	0.092
MS2	-0.333	-0.152	0.076	-1.990	0.049	-0.303	-0.001
KI1	-0.062	-0.028	0.070	-0.400	0.693	-0.166	0.111
KI2	0.230	0.121	0.087	1.400	0.166	-0.051	0.293
KI3	0.141	0.069	0.087	0.800	0.428	-0.103	0.241
KI4	0.059	0.029	0.094	0.310	0.755	-0.156	0.215

Table 5-10 PLSR FIT TPR MODEL B-1 (NCOMP = 5)

The hypotheses are tested in Table 5-10. H3b (p-value = 0.000 < 0.05) and H5b (p-value = 0.001 < 0.05) are accepted because H3b teleworker and H5b teleworking are statistically significant. Conversely, the remaining hypotheses (H1b, H2b, H4b and H6b) are rejected because they are statistically insignificant.

Importance of the variables in Model B-2

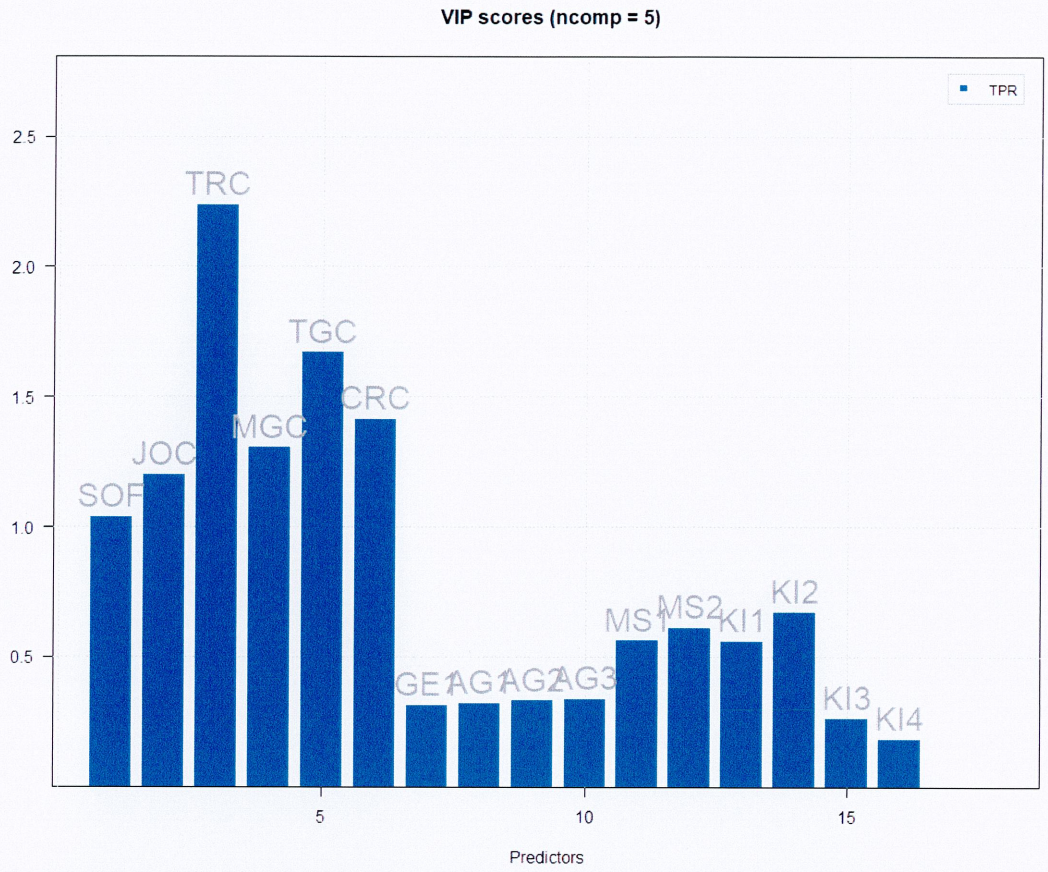


Figure *5—10 VIP Scores (ncomp = 5)*

The VIP scores in Figure 5-10 show the important variables for the TPR model B-2. The most important variables are near and greater than one. Therefore, the most important variables are SOF, JOC, TRC, MGC, TGC and CRC. These results are consistent with those in Table V.

Model B-2 results varies than Model B-1. In this model, all the dependent variables are important, except the demographic variables. Aboelmaged and El Subbaugh's (2012) study of Egyptian teleworkers reinforces the insignificant effect of demographic variables on TPR.

5.4 Analysis Results

Pre-pandemic literature has magnified the effect of SOF on teleworking. The balance between social and family life is one of the most common areas of telework research. Grant et al., (2013) found that telework that integrates work and non-work life could significantly benefit teleworkers and the organisation. Teleworkers have the ability to deal with family emergencies and bereavements. However, social isolation and the blurred boundary between work and family time may be exhausting and unhealthy.

The results of all models contradict the post-pandemic literature on SOF. Wong et al., (2020) found that personal and family well-being has the greatest effect on the telework effectiveness of Hong Kong teleworkers. Evidence from South Africa is consistent with other findings, as the results are different in terms of distraction due to family members when teleworking and preference for working and being productive while spending time with family (Matli, 2020). The statically insignificant results of SOF can be explained by telework being mandatory and comprehensive. The effect of a wide telework implication may produce controversial results.

No significant relationship was found between JOC and telework effectiveness and productivity. However, previous studies have linked task characteristics and low interdependency to more effective telework (Turetken et al., 2011).

The literature on TRC aligns with the results of this study. According to Davis (2011), flexibility, as a teleworking characteristic, increases

productivity, as reported by several organisations, such as AT&T, American Express and Dow Chemical (Ozcelik, 2010). Many studies have found a significant relationship between TRC and telework effectiveness and productivity, and increased autonomy during teleworking facilitates productivity and effectiveness (Baruch & Nicholson, 1997; Gajendran et al., 2015). Moreover, teleworkers with high self-discipline can organise and perform productively and effectively (Mello, 2007; Raghuram & Wieselfeld, 2004). Other qualities, such as self-motivation and time management skills, have a significant relationship with telework effectiveness and productivity (Beauregard et al., 2019). TRC is the most important and significant variable in all the study models. Teleworkers' qualities and characteristics can help overcome the drawbacks of telework. Moreover, teleworker characteristics play a main role in performing job tasks and delivering organisational goals. Note that the post-pandemic literature has not yet focused on the factor of teleworker characteristics.

The fourth most important variable in all models is MGC. Management characteristics include management support and trust, task-oriented evaluation, professional communication and training. According to Pyöriä, (2011), an acceptable trust in employees of management is a fundamental factor of telework success. Many studies have recommended that managers should evaluate employees based on output instead of behaviour ("Konradt et al., 2003; Cooper & Kurland, 2002"). Although "behaviour-based" evaluation is the most common practice because of its comprehensive approach, output-based evaluation is preferred during teleworking because of its accuracy and ease of measurement. Beauregard et al. (2019) revealed that professional communication between teleworkers facilitates the

information-sharing process and that it is the most important goal of communication during telework. Professional communication in the information-sharing approach lowers work-life conflict, enhances performance and creates a cooperative telework environment (Lautsch et al., 2009). Evidence has shown that teleworker training is required in the areas of setting up work area at home, continuing work relationships, communications and professional integrity, and time management skills, managing workload and performance. Managers needs to be trained in how to create and "maintain a work environment that supports telework (Johnson et al., 2007)". Only Model B-2 found MGC to be statically significant.

Using the TGC variable, we examined the popular characteristics of telework: reduced travel time and expenses, possibility of working during the highest productive time, less time for communication with employers, associated with knowledge transfer, suitability of the work area at home, promotion opportunity and availability of firm resources. Previous studies have stated the importance and significance of past characteristics (Beauregard et al., 2019). The results remained the same pre- and post-pandemic. All models found a significant relationship between TGC and telework effectiveness and productivity. TGC is the second most important variable after TRC.

CRC is the telework feature associated with the pandemic, such as working in case of quarantine or sickness, work without fear of contracting COVID-19 and opportunity for development. CRC is related to post-pandemic factors. Model B-2 found CRC to be statistically significant.

Surprisingly, Models A-2 and B-2 DMC found DMC to be statically insignificant and not important, despite the pre- and post-pandemic literature; see, Bawab and Elamir (2021).

5.5 Summary

This chapter presented the results of the questionnaire, the descriptive analysis and the analysis of the four models. Models A-1 and A-2 examined telework effectiveness as the dependent variable, and their results were similar. The results of Models B-1 and B-2 were drastically different from each other. Model B-2 resulted in all the dependent variables being significant, except demographics. Thus, all hypotheses were accepted. Model B-1 accepted only H3b and H5b. In the following chapter, we summarise the results and compare the pre- and post-pandemic literature.

Chapter Six: Conclusion and Recommendations

6.1 Introduction

In the previous chapter, four models were developed to analyse the questionnaire data, the results were presented, and the hypotheses were tested. The importance of the variables in the context of the four models was also evaluated. In this chapter, we elaborate on the testing of the hypotheses by comparing pre- and post-pandemic literature to better understand the results and give them a logical explanation. The findings from the previous chapter are summarised, and the managerial implications of the study findings are explained. The advantages of telework have attracted practitioners and managers. This study captures the importance of telework from the managerial implications of the results. The study's limitations and resources are also presented. Practises and directions are recommended to researchers, practitioners and managers to pave the way for more study directions. The chapter concludes with a summary.

6.2 Interview Results

An interview was conducted with a system administrator working in the IT department at Batelco. The questions were adapted from the questionnaire. Interviewee is a 38-year-old married male with four children, and he experienced teleworking for 14 months. The first question was about the direct and nondirect impacts of teleworking on his social and family lives. According to Waleed, 'The effect of telework on my social and family life was positive in general. I had more time spent with my family, and I was able to be with them when needed. The drawbacks were playing the role of

managing telework and boundary setting, which varies among teleworkers'. This is consistent with the literature on family and work–life balance (Ammons & Markham, 2004; Johnson et al., 2007).

The second question asked about the difficulties faced by teleworkers affecting productivity. Waleed stated, 'As a Batelco IT department employee, I used to telework but not as frequently and intensely as in the past 14 months. Our IT job tasks can be performed easily from home, but other departments, such as HR, require us to be present in the office at least once a month to print payroll sheets, for example. Moreover, when working from home, we do not receive replies from our colleagues through email or by phone. Therefore, it is difficult to get in touch with them instantly, unlike in the office, where we can physically go to them'.

The third question asked about the difficulties faced by teleworkers affecting telework effectiveness. Waleed said, 'Interruption from family members can affect effectiveness'. In terms of the advantages in productivity and effectiveness, Waleed revealed, 'Reduced communication with my colleagues increased my productivity, and virtual meeting arrangements were faster and easier. A conventional meeting room arrangement was ineffective and lowered productivity'.

The fourth question was about the qualities that teleworkers must have. According to Waleed, 'The most important is honesty, as telework decreases supervisor and employee visibility. It is very important for teleworkers to be self-disciplined and have time management skills'. Waleed ranked the qualities in order of importance as follows: self-discipline, time management skills, self-motivation and autonomy. The

reason for his ranking is the nature of teleworking. As it reduces supervisors' visibility, self-discipline is the most important, and autonomy is the least, as his task did not require much guidance from managers. In terms of the qualities and skills that management needs while teleworking, Waleed said, 'In planning and distributing tasks, managers should distribute tasks evenly and evaluate teleworkers based on task accomplishment'. Regarding teleworking characteristics, Waleed revealed, 'The positive aspects of telework are saving time to travel to work, decreased communication with colleagues and new ways to perform tasks. The disadvantages are the variation in productivity among teleworkers and its negative effect on social relationships at work. To overcome these drawbacks, the use of video meetings instead of audio only should be mandatory'. Waleed ranked the teleworking characteristics in order of importance as follows: less time for communicating with co-workers, promotion opportunities, suitability of the work area at home, difficulty in resource availability and knowledge transfer. Waleed reported that his productivity increased while teleworking and that he found better telework effectiveness because of the reduced time spent communicating with co-workers and finding new ways to perform tasks.

6.3 Summary of the results

In testing the model, A-2, B-1 and B-2 H3 and H5 are accepted, as TRC and TGC have a significant relationship with telework effectiveness and productivity. Model A-1 accepts H6, as CRC has a significant relationship with telework effectiveness.

The results are consistent with the previous literature on teleworker characteristics. As the most important and significant variables, "worker autonomy and employment flexibility were found to be more critical than technological provision in facilitating successful implementation (Clear & Dickson, 2005)". Moreover, the results on teleworking characteristics have empirical evidence about their significant relationship with telework effectiveness and productivity (Ndubisi & Kahraman, 2005).

Despite the previous studies on the significant relationship of demographic variables with telework effectiveness and productivity, none of the four models found a significant relationship. As post-pandemic telework practice was mandatory and extensive, this nature of the practice could affect the importance and effects of demographic variables.

6.4 Managerial Implications

As we presented the evidence in this chapter, tit can be concluded that teleworker characteristics, including self-discipline, time management skills, self-motivation and autonomy, are very important when choosing and training teleworkers. Training is required to improve previous qualities. Gender, age and social status are not important when choosing teleworkers.

The practice of managers needs to adapt to the nature of telework, maintain professional communication to overcome the isolation of teleworkers and facilitate knowledge transfer. Managers should also go back to performing task-based evaluations for better and fairer assessments.

Firm policies and government regulations need to be enacted as telework practice becomes mandatory and extensive.

6.5 Research Limitations

Research has time and resource limitations. The following are the limitations specific to our study that may affect the quality of this research:

1. One sector of telecommunication was examined, the study results may be generalised to the technological sector, such as electronics, software, computers and artificial intelligence.

2. Other statistical methods could be applied to obtain different and more meaningful outcomes.

3. Real-time data and actual outcome measures can be used to better represent productivity rather than reported productivity.

4. Limited number of respondents compared to sector employees' number. Moreover, only one interview was conducted.

Future studies recommended to increase sample size and include more than one sector. Moreover, it is recommended to use other measures as real time data.

6.6 Research Recommendations

As telework's importance increased pre-pandemic and the implications of telework rapidly grew post-pandemic, the managerial implications and recommendations were presented earlier in this chapter. In this section, we recommend to researchers and academics the areas of study we believe to be the most important and can contribute to the current literature, enriching the implications and understanding of teleworking.

In the study, we segregated the literature and instruments pre- and post-pandemic because of the intense use of telework, the implications of mandatory telework and the number of teleworkers compared to a conventual work arrangement.

- Previous studies have examined the extensive and long-term practice of teleworking and have recommended periodically analysing the expected teleworker reciprocity variation over time (Gajendran et al., 2015).
- Practicing telework is no longer optional and cannot be considered a 'special' arrangement anymore (Canonico, 2016). Telework preferences and suitability can change over time because of social conditions. Teleworkers may feel forced to telework in an inappropriate environment.
- Extensive periods of teleworking can affect opportunities for promotion and career development because of low visibility and reduced communication between managers and teleworkers. Beauregard et al. (2019) found that teleworkers could lose interest in managerial and supervisorial promotions, as they require attending conventional work arrangements.
- The organisational career path and leadership setting need to be evaluated after this extensive use of telework. A new direction of telework studies must deeply examine the effect of telework on organisational performance, managerial practice and HR polices.
- In addition to the effect of telework on teleworkers' psychological and personal lives, further research is recommended to investigate the gaps in the external effects of extensive teleworking practices. Empty offices, transportation, and the cultural, environmental, legal and economic aspects should be examined.

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Appendix A

Questionnaire assessing the factors affecting work effectiveness and productivity in teleworking in the Bahrain telecommunications sector

This survey is part of the MBA thesis of students at the University of Bahrain. Your genuine response will be highly appreciated for us to assess the factors affecting work effectiveness and productivity in teleworking in the Bahrain telecommunications sector. We assure you that the information obtained from this questionnaire will be kept confidential and will be used for academic purposes only. It will not be disclosed to any third party.

Social Factors						
1	Gender:		Male ☐		Female ☒	
2	Age:	18 to 25 ☐	26 to 35 ☐	36 to 45 ☐	46 to 55 ☐	56 and above ☐
3	Marital Status:	Single ☐		Marred ☐		Divorced or Widower ☐
4	Number of kids:	One ☐	Two ☐	Three ☐	Four or more ☐	

Please select the best choice for each of the following statements:

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Social Factors						
5	"When working from home, I am able to take care of my child/parents".	☐	☐	☐	☐	☐
Job Characteristics						

6	"Tasks with high-level interdependence are hard to do when I work from home."	☐	☐	☐	☐	☐
7	"My work environment is flexible and allows me to have full control over my work."	☐	☐	☐	☐	☐
8	Our organisation's simple structure facilitates productivity while working from home.	☐	☐	☐	☐	☐
	Teleworker Characteristics					
9	My autonomy helps me telework effectively.	☐	☐	☐	☐	☐
10	My self-discipline helps me telework effectively.	☐	☐	☐	☐	☐
11	My self-motivation helps me telework productively.	☐	☐	☐	☐	☐
12	My time management skills help me telework productively.	☐	☐	☐	☐	☐
	Management Characteristics					
13	"I think my employer trusts me a lot when he/she provides me the opportunity to work from home."	☐	☐	☐	☐	☐
14	Task-oriented evaluation is fair when working from home.	☐	☐	☐	☐	☐
15	Professional communication between the manger and employees diminishes the feeling of isolation when working from home.	☐	☐	☐	☐	☐
16	My training is useful when I work from home.	☐	☐	☐	☐	☐
	Teleworking Characteristics					
17	When working from home, I save on travel (transport) time and expenses.	☐	☐	☐	☐	☐
18	"When working from home, I am able to work during the most productive time."	☐	☐	☐	☐	☐
19	"When working from home, I am less disturbed by my colleagues."	☐	☐	☐	☐	☐

20	When working from home, it is hard for me to transfer knowledge to my colleagues or gain knowledge from them.	☐	☐	☐	☐	☐
21	When working from home, I have a separate room or space suitable for me.	☐	☐	☐	☐	☐
22	"When I work from home, my supervisor rarely sees me and my career opportunities decrease."	☐	☐	☐	☐	☐
23	When working from home, I can access all office resources.	☐	☐	☐	☐	☐
	Crisis Characteristics					
24	I am able to work from home during COVID-19 quarantine or when I am sick.	☐	☐	☐	☐	☐
25	"I am able to work from home without fear of sickness during the COVID-19 pandemic."	☐	☐	☐	☐	☐
26	Teleworking during COVID-19 has given us the opportunity to develop and adapt many unnecessary procedures and practices (e.g. switching to digital transactions and rationing the use of paper).	☐	☐	☐	☐	☐
	Telework Productivity					
27	I am less productive in my traditional environment.	☐	☐	☐	☐	☐
28	Teleworking allows me to be more productive.	☐	☐	☐	☐	☐
29	I can finish many tasks daily when teleworking.	☐	☐	☐	☐	☒
	Telework Effectiveness					
30	I can achieve better concentration when teleworking.	☐	☐	☐	☐	☐
31	Teleworking improves my work efficiency.	☐	☐	☐	☐	☐
32	I have more time to work when teleworking.	☐	☐	☐	☐	☐

The questionnaire was adapted and modified from previous studies by the authors to adhere to the aim of the study.

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Appendix B

Interview about "the Determinants of Effective Telework: Evidence from the Telecommunications Sector in Bahrain."

The interview is part of the MBA thesis of students at the University of Bahrain. Your genuine response will be highly appreciated for us to assess the factors affecting work effectiveness and productivity in teleworking in the Bahrain telecommunications sector. We assure you that the information obtained from this interview will be kept confidential and that it will be used for academic purposes only. It will not be disclosed to any third party.

Social Factors						
1	Gender:	Male ☐			Female ☐	
2	Age:	19 to 25 ☐	26 to 35 ☐	36 to 45 ☐	46 to 55 ☐	56 and above ☐
3	Marital Status:	Single ☐		Marred ☐		Divorced or Widower ☐
4	Number of children:	One ☐	Two ☐		Three ☐	Four or more ☐
Social Factors						
5	What are the positive effect of telework on social life?					
٦	What are the negative effects of telework on social life?					
Job Characteristics						
7	What are the difficulties affecting productivity in teleworking?					
8	What are the difficulties affecting effectiveness in teleworking?					
9	What are the characteristics affecting productivity in teleworking?					
10	What are the characteristics affecting productivity in teleworking?					

Teleworker Characteristics	
11	What are the most important qualities and skills that an employee needs when teleworking?
12	Rank the following qualities and skills in order of importance to increase productivity when teleworking (self-discipline, self-motivation, time management skills, autonomy):
Management Characteristics	
13	What are the most important qualities and skills that management needs when teleworking?
Teleworking Characteristics	
14	What are the pros of teleworking in general?
15	What are the cons of teleworking in general?
16	What are your suggestions to overcome the cons of teleworking?
17	What are the most important factors that can help increase telework effectiveness?
18	Rank the following factors in order of importance to increase effectiveness when teleworking (reduced travel time and expenses, reduced time for communicating with co-workers, knowledge transfer difficulty, promotion opportunity difficulty, suitability of the work area at home, resource availability):
Crisis Characteristics	
19	Was the effect of working from home positive or negative during "the COVID-19 pandemic"? How?
Telework Productivity	
20	Are you more productive when teleworking? How?
Telework Effectiveness	
21	Was the effect of working from home positive or negative? How?
22	Do you prefer to continue teleworking even after the COVID-19 pandemic, at least partially?

جامعة البحرين

كلية إدارة الأعمال

قسم إدارة الأعمال

العوامل المحددة لفعالية العمل عن بعد: أدلة من قطاع الاتصالات في البحرين

أطروحة مقدمة كجزء من متطلبات الحصول على درجة الماجستير في إدارة الأعمال

إعـــداد

قيس محمد البواب

الرقم الجامعي: ٢٠٠٩١٩٧٨

إشـــراف

د. السيد علي حبيب الأمير
أستاذ مشارك
جامعة البحرين

مملكة البحرين

فبراير ٢٠٢٣م