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# A DIVIDEND OR DETRIMENT? EFFECT OF WFH ON WORK-LIFE BALANCE OF SOFTWARE ENGINEERS. A STRUCTURAL EQUATION MODELING BASED EMPIRICAL INVESTIGATION CARRIED OUT DURING COVID-19

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## **ABSTRACT**

Once the Covid-19 pandemic broke out, traditional workplaces were transformed into online workstations, forcing people to embrace the notion of Work From Home (WFH). This study focuses on the WFH ideas related to work-life balance as now formal work is done under the roof of the home, blurring the boundary between work and family. Thereby, the study unveils the impact of WFH on Sri Lankan software engineers' work-life balance. Further, considering the cultural background of Sri Lanka, the study examines the moderation effect of gender on the above relationship. Researchers collected 314 valid responses using a questionnaire circulated online for data gathering. The Partial Least Squares Structural Equation Modeling (PLS-SEM) technique was utilized to analyze the data using SmartPLS 3.3.9 software. Once testing the hypothesis empirically, the study results showed that WFH significantly affects work-life balance, but gender does not serve as a moderator. The study suggests that software engineers should focus more on exercising the best WFH practices with self-motivation to lead an equilibrium in work and life. Organizational procedures also seem to be essential in this setting in providing employees with a smooth and supportive WFH environment. This investigation is fruitful and offers unique insights for workers who WFH to establish a balance between work and life and eventually have a content workforce despite the Covid-19-driven hardships in Sri

**Key Words:** Work From Home, Work-life balance, Covid-19, Software Engineers, Sri Lanka

## 1. Introduction

Due to the transmissible nature of Covid-19 in April 2020, in Sri Lanka, almost every firm had to shut down, either permanently or temporarily (Rathnaweera and Jayathilaka, 2021). As such, to cope up with the pandemic whilst continuing business operations the concept of Work From Home (WFH) came into practice. WFH is where performance of work activities are carried out without commuting to a physical workplace. Thereby, employees started to attend job duties at the comfort of their home. With this close connection to home, overlapped 'work' and 'life' domains, the concept of "Work-life balance" materialized. Many previous studies emphasize that WFH had blurred the lines between work and life, making physical boundaries hardly identifiable.

From the perspective of software engineers, the relationship between WFH and work-life balance is considerably more difficult because, they are pushed for longer working hours due to the ease of accessing job related technical equipment (laptops, networks), even at home. Moreover, they are likely to continue practicing WFH for a foreseeable future due to various other benefits. In relation to the idea of work-life balance, previous studies have shown that it may be impractical for a software engineer to turn off the laptop at the end of the work shift and transfer to personal life in a home-based working arrangement (Tokdemir, 2022), making it more difficult for them to achieve work-life balance.

Considering the Information Technology (IT) sector, the percentage of fully operational establishments in Sri Lanka from April to May 2020 was 10.16%, ranked second only to the agriculture, forestry, and fisheries sector. Moreover, only an insignificant amount of 20.22% of the employees in the IT sector (compared to other sectors) lost their jobs during the same period (Wimalaweera, 2020). This reflects the fact that the IT sector continued to operate despite the pandemic by choosing WFH, as soon as the pandemic situation worsened. Today, nearly all software engineers in Sri Lanka are employed as teleworkers who WFH. Moreover, almost every IT organization is prepared to practice full-time WFH for extended periods given the ongoing pandemic spread and other cost advantages. Thus, above mentioned research findings and prevailing situation of the country emphasize the crucial need for a study to be carried out in the perspective of software engineers, regarding concepts of WFH and work-life balance.

Further, studies suggest that both men and women pay less time on work activities while telecommuting. However, it can be seen that women adore the WFH policy as they could pay more attention to their children and other household chores whereas men are attracted to additional pay while WFH more than usual working hours (Farooq and Sultana, 2021). These results persuaded the study to examine the gender moderation effect on the relationship between WFH and work-life balance.

The main objective of this study is to unveil whether WFH significantly impact work-life balance of software engineers in Sri Lanka, while examining whether gender moderates the above relationship. As a result, this study is distinct from past studies and adds to the body of knowledge in four important ways. Firstly, according to researchers' knowledge, no prior study has been carried out addressing the same concepts in local arena (Rathnaweera and Jayathilaka 2021), thereby, this study will be the first endeavor

on this specific topic. Thus, the focus of this work is to fill the above-mentioned empirical gap. Secondly, according to the Annual Report 2020 of the Central Bank of Sri Lanka (CBSL), IT and telecommunication services has played a pivotal role in Covid-19 WFH arrangements, by achieving a growth of 14.1%, out-performing all other service sectors. Hence, CBSL have suggested to embrace permanent adoption of WFH practice, with the aim of achieving better economic growth. Thus, discoveries of this study would be fruitful to step towards amplifying economic growth. Thirdly, the results offer insights for software developers, on how to balance their work and personal lives in the face of the Covid-19 pandemic. Finally, policymakers of IT industry will find the study results helpful, in formulating effective policies and strategies and eventually to have a satisfied, work-life balanced labor force within the nation.

### 2. Literature Review

The concept of achieving a balance between work and life received much attention, due to WFH practices triggered by Covid-19. A study done in United States by Leslie et al., (2019) stated that the two main spheres of a person's social life are work and personal life, and in the modern world, maintaining a balance between the two has become essential. Golden (2021) defines WFH as a work method that comprises working away from a traditional corporate headquarters for a certain period and using technology as needed to complete tasks. Due to the pandemic-risen WFH practices, employees are now expected to use telecommuting methods or WFH, which has raised their consciousness regarding their obligations to maintain work-life balance (Bhumika, 2020). Studies mostly point out that WFH affects the extent of balancing work and life. In a study conducted in India, according to Islam (2022), the phrase "Work From Home" suggests that the boundaries between home and work may become fuzzier. Yet several studies point out a positive impact on work-life balance due to WFH. Golden (2021) explains that remote workers who possess good co-ordination skills find it stress-relieving to WFH, by realizing that family members will seek them only when they are required.

Smite et al., (2021) express that due to the experienced struggle of balancing work and life domains, software engineers had to work longer hours than typical work hours. This finding was further supported by Tokdemir (2022) by claiming that not only working hours, but tension within the workplace, strain and mental health disorders were aggravating. Therefore, considering this study's context, for software engineers who WFH are more likely to experience a significant impact on their work-life balance. In this sense, the first hypothesis put out by researchers is as follows:

**H**<sub>1</sub>. There is a significant impact of WFH on work-life balance of software engineers.

Several studies have been conducted to investigate whether the role of gender has a crucial impact of moderating the relationship between WFH and work-life balance. According to Balamurugan & Sreeleka (2020), a study done in India point out that women balance their work and life, which varies according to their sector of occupation. Uddin (2021) further argues that working women have been subjected to significant changes and turbulence as a result of pandemic of Covid-19. As such, they have faced a variety of obstacles, one of which, is achieving an optimal role balance. In keeping with this line of thought, researchers put forward the second hypothesis:

**H<sub>2</sub>:** Gender factor moderates the relationship between WFH and work-life balance of software engineers.

Concerning the above developed hypothesis, researchers put forward the following conceptual structure for the study Figure 1.

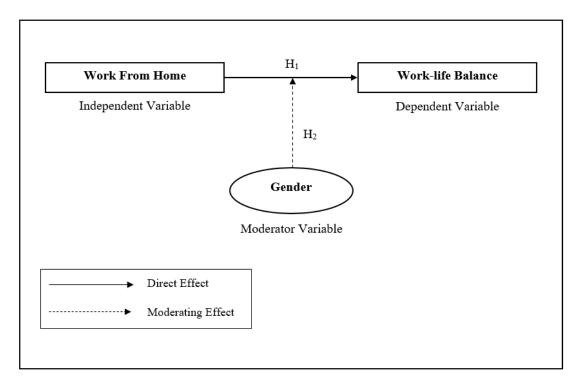


Figure 1. Conceptual framework

Source: Authors' compilation

## 3. Methodology

The study used a deductive approach for data analysis, informed by positivist philosophy. The data for this study were gathered primarily via a questionnaire to operationalize the constructs in the study, employing a quantitative methodology. In terms of the time horizon, a pilot survey was conducted in April 2022 with forty-three respondents. In order to avoid any biases that could be present within the data collection, the researchers used the simple random sampling approach. Usage of simple random sampling; a representative sampling technique, in the study increased the generalization of the study results for the entire population of software engineers in Sri Lanka. The population was approximately 9,402 software engineers, which was represented by a sample size of 384. Later, the survey was conducted by distributing 384 questionnaires, in May 2022, adhering to a cross-sectional approach. Results of the pilot survey established validity in the survey instrument, by expressing decent reliability and validity values.

The data for this study, data were gathered by utilizing the questionnaire method to collect information on the constructs employed in the study. Mainly two sections made up the questionnaire. Data on the respondents' socio-demographic traits were included in the first section. The scale metrics which were used to measure the constructs in the

study, were included in the second section of the questionnaire. The unit of analysis that is adhered to throughout this study are Software engineers working for software development firms in Sri Lanka's Western Province. The questionnaire was disseminated via emails and well-known social media platforms, which resulted in a total of 314 responses with a response rate of 81.77%, and hence were taken into account when capitalizing the study's analysis. For the aim of data analysis in this work, researchers used the Partial Least Squares Structural Equation Modelling (PLS-SEM) technique.

## 3.1. Data Analysis

PLS-SEM is a powerful and a popular technique used for conducting multivariate analysis (Hair, Ringle and Sarstedt, 2013). The said technique was carried out using Smart PLS 3.3.9 software, thus is the study's analytical tool.

The analysis of this study is carried out in the common two step approach, which is first validating the outer model or the measurement model to confirm reliability and validity and second, the inner or the structural model, to understand the significance of the relationships (Kumar and Mokashi, 2020). Bootstrapping technique is used to evaluate the significance of the relationships that exists among the latent variables. Finally, a comparison of the t-statistics and p-values of the hypothesized relationships are carried out to confirm the significance of the relationships (Hair et al., 2021).

### 4. Results

### 4.1. Measurement Model Results

## 4.1.1. Assessment of Reliability

The reliability of the constructs is assessed to examine the consistency of fit of data, considering the Cronbach's Alpha value. The acceptable range of reliability is greater than 0.7, and values resulting greater than 0.8 are considered to be good (Sekaran & Bougie, 2016). The results expressed that WFH construct possess a Cronbach's Alpha value of 0.876 while work-life balance construct has 0.858. Since both constructs' Cronbach's Alpha values are greater than 0.8 it can be inferred that a good reliability or internal consistency exists among the items used in the study. Cronbach's Alpha value pertaining to each latent variable can be referred in Table 1.

Table 1: Results of the Measurement Model

Latent Variable	Cronbach's Alpha	Average Variance Extracted (AVE)	WFH
WFH	0.876	0.522	-
Work-life balance	0.858	0.545	0.510

Source: Authors generated through Smart PLS

## 4.1.2. Assessment of Convergent Validity

Convergent validity is tested to examine whether the items converge enough to measure one latent variable that is considered. In this assessment, focus is given to Average Variance Extracted (AVE) scores of the latent variables. Thereby, when AVE scores greater than 0.5, convergent validity is established (Hair, Ringle and Sarstedt, 2013). As shown in Table 1, variable WFH expresses an AVE score of 0.522 and work-life balance express 0.545, where both are greater than the recommended threshold. Thereby, it can be confirmed that the variables possess convergent validity, denoting that the items used to measure the variables converge well.

# 4.1.3. Assessment of Discriminatory Validity

Discriminatory validity is evaluated to confirm if there is a low correlation between the variable in consideration and a variable that is unrelated to it (Sekaran & Bougie, 2016). Researchers have used the Heterotrait-Monotrait (HTMT) ratio, to assess this among the variables. According to HTMT ratio, the HTMT value which is there in between the latent constructs should be less than 0.9 to have discriminatory validity. Since the HTMT value among WFH and work-life balance variable is at 0.510 as shown in Table 1, it can be confirmed that the discriminatory validity is too established, inferring that the two considered constructs are distinct.

Thereby, considering above measurement model results (Table 1), it can be confirmed overall that the data fits well for the study. Consequently, it can be moved forward to test the structural model.

## 4.2. Structural Model Results

After bootstrapping was performed with 500 sub-samples and a significance level of 0.05, the t-statistic and significance of the link between WFH and work-life balance, as well as the moderating influence of gender on the aforementioned relationship, were determined. In the perspective of this study, considering 5% significance the p-value should be less than 0.05 as well as the t-statistic should be greater than 1.96 in order to infer that the relationships are significant. The model's output statistics can be referred in Table 2.

**Table 2: Results of the Structural Model** 

Relationship	T-statistics	P-values
WFH -> Work-life balance	8.115	0.000
Gender*WFH -> Work-life balance	0.020	0.984

Source: Authors generated through Smart PLS

According to Table 2 the t-statistic of the relationship between WFH on work-life balance is 8.115 which is greater than 1.96 threshold, proving the significance of the relationship. Further, the p-value which is 0.000 is less than the significance level 0.05

confirms the relationship is significant. The p-value of the gender moderation relationship; 0.984, is greater than 0.05 interprets that the relationship is insignificant, resulting gender does not moderate the relationship between WFH and work-life balance. The structural model of the results gained is illustrated in Figure 2.

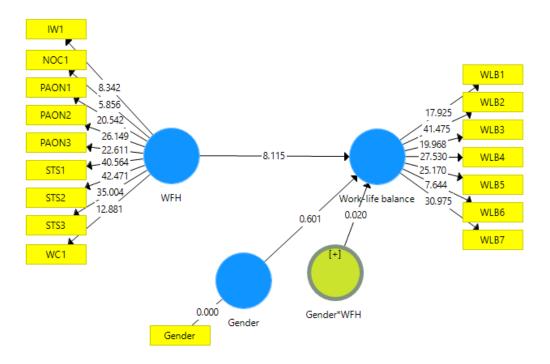


Figure 2. PLS results of the structural model

Source: Generated through Smart PLS

#### 5. Discussion

The study was carried out to assess whether a significant relationship exists between WFH and work-life balance, specifically for software engineers, amidst the Covid-19 pandemic. Furthermore, this study investigated whether the gender factor moderates the above-mentioned relationship. Being in line with Hypothesis 1 (H1), after the analysis, it was found that WFH does have a significant impact on the work-life balance, with a p-value of 0.000. This result confirms the study results of many past researchers. In an Indonesian study, Irawanto, Novianti and Roz (2021) claimed that WFH possessed a significant impact on work-life balance by using Smart-PLS software to analyze the responses from the 472 participants who were made to WFH throughout Indonesia. Rathnaweera and Jayathilaka (2021) also confirm that the working environment and non-working environment have a positive and significant impact on the work-life balance in a study conducted in Sri Lanka by examining the virtual platform. The same result has been elaborated by several researchers in European studies, Palumbo (2020); Palumbo, Manna, and Cavallone (2020) by looking into work-life balance with the aspect of work-life conflicts. Due to the blurring of the lines between work and daily life, the study hypothesizes that home-based telecommuting may result in conflicts between work and personal life. Hence, the significant relationship between the WFH and worklife balance has been proven by recent studies carried out during the Covid-19

pandemic. As a result, using previous study results, the results for this hypothesis can be confidently expressed. Considering the study results, specifically on the perspective of software engineers, Gibbs, Mengel, and Siemroth (2021) state that the work of software engineers involves multiple tasks, high cognitive demands, inventiveness, and extensive collaboration. They have analyzed productivity before and throughout the WFH phase of the Covid-19 outbreak, using people and analytics data from over 10,000 skilled employees at a significant Asian IT services organization. Hence, the findings of this study can be further proved by the studies carried out considering a similar context as well. Therefore, achieving all the above while WFH without direct supervision can be considered a challenging yet crucial task. Thus, WFH should be practiced in an efficient manner to have a sound work-life balance since the findings of this study support this challenge, resulting in the significant impact of WFH on work-life balance.

However, the contrary of the hypothesized relationship of Hypothesis 2 (H2) was resulted in this study. It was found that the gender factor does not moderate the relationship between WFH and work-life balance with a p-value of 0.984. The result of this study was surprising for the researchers, since many of the past research had expressed conflicting results. Yucel and Chung (2021) in a German study stated that women tend to experience more work-life imbalances than compared to men. Also, Sellar and Peiris (2021) study results showed that working from home had a big impact on job satisfaction, especially for women, which was carried out in a Sri Lankan context. Thereby, researchers also anticipated the same, considering that Sri Lanka is a cultural country where women carry almost all the burden of household chores, it would be harder for women to achieve work-life balance while WFH. However, the expectations of researchers were overturned.

Tokdemir (2022) in his research demonstrates that, as a result of a lack of direction, software engineers may be drawn to work longer than usual hours. Therefore, thorough guidance or supervision should be available according to previous research to excel in WFH. If not, software engineers should have the motivation to achieve work duties whilst experiencing autonomy. In the IT industry, employee personality and personal goals are the major factors that determine motivation while WFH (Haridas, Rahul and Subha, 2021). Hence, in instances where supervision is absent, self-motivation plays a crucial role for software engineers to achieve work-life balance while WFH. While the study demonstrates no moderation of gender between WFH and work-life balance, in a Moroccan study conducted considering IT employees, Semlali & Hassi (2016) explains that females may take care of household duties during the day as work permits and be near their kids if necessary if they WFH, as a result females have an added advantage. These factors might have led to the result of no moderation of gender between WFH and work-life balance.

To help employees have a better work-life balance, employers should consider these findings when developing policies. Furthermore, the findings of this study could benefit all WFH employees, not just software engineers, workers in IT-related businesses, and workers in other industries to achieve a better work-life balance. It can be said that the research hypothesis, which claimed that software engineers struggled to strike a balance between work and personal life during the Covid-19 emergency scenario, is at

least partially confirmed. Additionally, the findings are in line with the goal of determining how WFH affects work-life balance in the Sri Lankan context.

## 6. Conclusion and Implications

The lockdowns and the rapid spread of Covid-19 led to the concept of WFH becoming a more full-time methodology that is used in the Sri Lankan context, and globally. With the workplace now becoming home-based, it was crucial to identify the effect of this on the work-life balance of the employees. This study was conducted to examine whether WFH has a significant impact on work-life balance, and whether gender moderates the relationship between WFH and work-life balance. As per the annual report 2020 of Central Bank of Sri Lanka (CBSL), Sri Lanka's IT and telecommunications sector was critical in attaining 14.1% growth during Covid-19 under WFH conditions and this sector has done economically better than other service sectors. This study's results expressed that WFH does significantly impact on work-life balance of the software engineers, while gender does not play a moderating role between the two variables Since WFH have a significant impact on work-life balance, this study suggests especially for software engineers, as concerned in this study, to attend more into best work-home boundary management strategies whilst WFH. Besides employees themselves, IT firms also are majorly responsible, hence can benefit from the study results.

This study extends to the limited body of knowledge on the pandemic's implications on the work-life balance of Sri Lankan software engineers. The study results are fruitful for software engineers as well as employees in other industries, to have an equilibrium among work and life amidst the Covid-19 hardships. As a result of the study's exclusive emphasis on the IT and software development sectors, future research may examine the effects of a number of industries rather than just one. Further, future studies can look into the significant factors which would affect to work-life balance, while WFH.

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