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Effectiveness of a Four-days/Eight Hour Work Week

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Effectiveness of a Four-days/Eight Hour Work Week

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RSCH 202: Intro to Research Methods

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Abstract

This research paper explores the benefits of a four-day workweek that may affect productivity, self-satisfaction, and life expectancy. We will be using data on a country-wide scale from 25 first world countries over four continents. We will perform regression analysis to investigate the impact of a four-day workweek. The data will be collected using free and public sources published online like Our World In Data and Statista, which include GDP per capita, life satisfaction rate, human development index, and annual working hours. The results of our research and analysis will show how each independent variable will affect the dependent variable of our study, as well as any correlation between them. We aim to uncover any benefits of switching to a four day/eight-hour workweek and support the move for companies to reconsider the traditional five day/eight-hour workweek in hopes of improving the quality of life of working adults. Our results show that Human Development Index, Gross Domestic Product has a p-value of more than 0.05, and therefore we do not reject the null hypothesis that the four days work week has no impact on productivity in the workforce. Life Satisfaction Rate on the other hand has a p-value of less than 0.05, thus rejecting the null hypothesis that the four days work week has no impact on the satisfaction rate of the workforce.

Keywords: life satisfaction, hours of work, four-day work week, productivity

Introduction

As the global pandemic intensified from end-2019, it became clear that the work from home regime was necessary for the workplace to continue their function (Fontinha, 2021). This sudden shift in working culture has prompted different organizations around the world to explore ways to increase worker's work-life balance and productivity without suffering pay cuts. Thus, the idea of reduced working hours where employees work four-day/ eight hours per week instead of a five-day work week, has been a talking point in various developed countries around the world.

The growth in discussions of a four days/eight-hour work week has spurred interest among researchers all around the world due to evidence showing increased productivity, happiness, as well as work-life balance. Similarly, Singapore has turned its focus on work-life balance ever since the National Day Rally held in 2004 (Meah, 2021). During a parliament meeting in 2021, Workers' Party Member of Parliament (MP) Louis Chua introduced the idea of a four-day workweek in Singapore, citing statistics from Microsoft Japan, where productivity increased by 40 percent, and the satisfaction rate increased to 94 percent. Additionally, it was analyzed that the four-day workweek could boost the work-life balance, and even increase the birth rate in Singapore.

This literature review aims to provide context to the research regarding the four-day/ eight hours workweek through the analysis of multiple studies conducted about the effectiveness of cultivating a four-day workweek among employees. The study into this program will look at benefits through the study of productivity and employee satisfaction rate and hope to spread awareness of its effectiveness to suitable companies, thus improving the overall productivity rate and satisfaction rate of the organization.

Literature Review

This literature review discusses why the four-day/eight hours work week benefits both companies and their employees as research has shown that longer working hours harm the employees and does not amount to a more effective organization.

Based on the concept of a four-day workweek, the aim is to reduce the standard five-day, 40-hour week to 32 hours per week in four days. However, the concept faces heavy objections based on the current norms of employment. Therefore, the reduction in the number of working hours might seem like an absurd suggestion (Grosse, 2018). However, with reference to Figure 1, the number of hours needed to produce as much work has reduced over the past 50 years, indicating that it only takes approximately 10 hours now to achieve the same amount of work done in 40 hours in the 1950s. The production rate is equal to that of a 40-hour worker indicates that the four-day workweek would be an increasing trend rather than a radical departure from historical norms (The Economist, 2021).

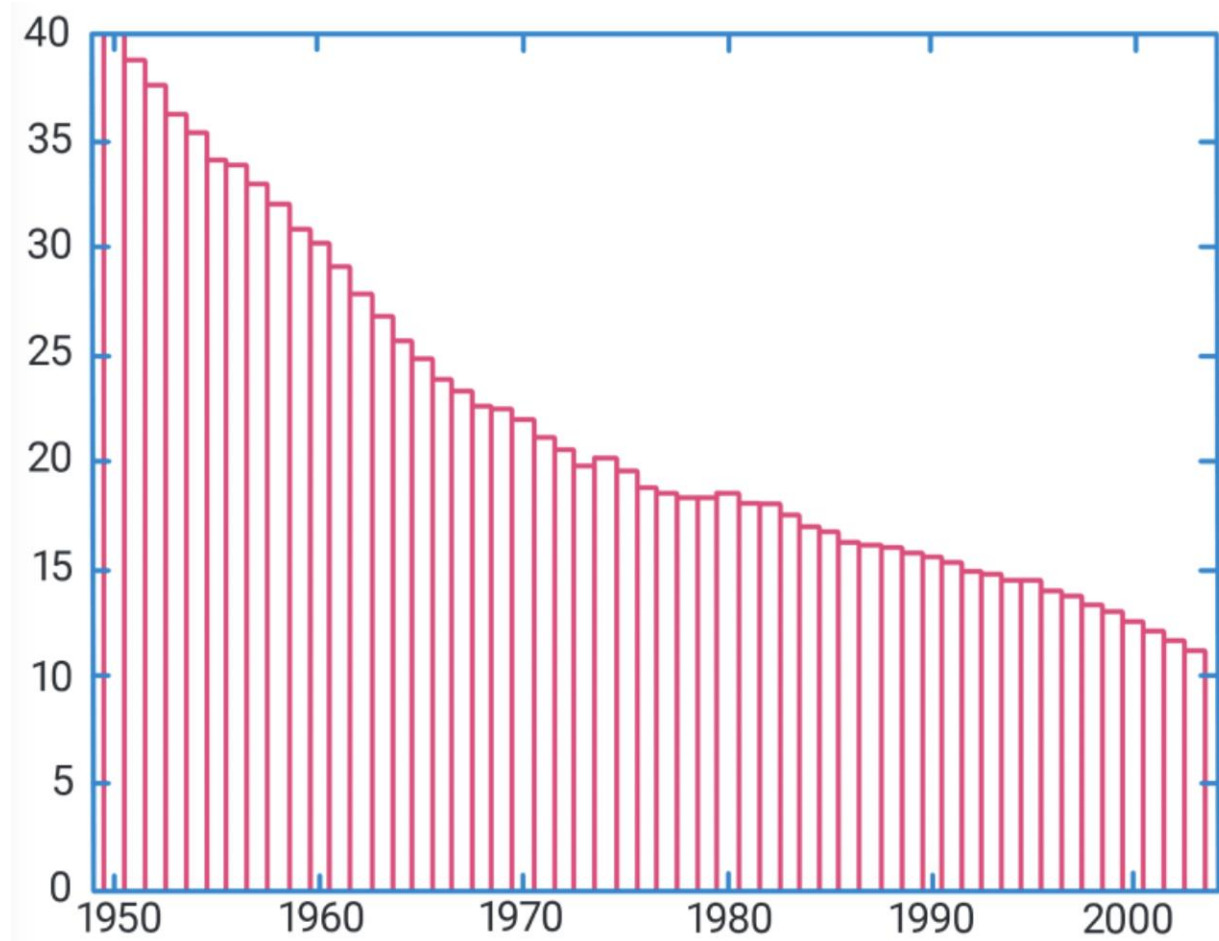


Figure 1. The number of weekly hours needed to produce as much as a 40-hr worker in 1950 (COING Inc., 2017)

In research based on the flexible working arrangements of employees, Hyatt and Coslor (2018) wield data based on the 40 working hours across the entire week, with the number of days shortened to four from the normal five. Even though this survey incorporates a huge sample of 779 people, it excluded information such as gender in their variable. Additionally, the data collected was received from the municipal government, which fails to inform the occupation of the people that the data was received from. The data gathered from all surveyees were not constant as the method used to gather data was a single-question employee survey, resulting in

ambiguous correlations of various variables such as personal commitments and time with loved ones may not be credible as different people may have different lifestyles and family backgrounds. Despite all this, the research had overall concluded a general increase in productivity and happiness within the subjects, which indicates strong evidence of the benefits of a four-day workweek. This research emphasizes the effect on productivity and happiness based on the reduction of working days without the reduction of working hours.

The current belief of organizations is that reducing the number of days employees spend in their workplace, reduces the amount of time available for work, causing a reduction in productive output, and a decrease in profits of the company (The Economist, 2021). However, the facts are proved to be false claims by Professor Robert Grosse (2018), as the introduction of a four-day workweek are highly beneficial for both the organization and its workers due to the reason for the circumstance that it can help save time and money, increase the workers' self-esteem and job satisfaction, improved productivity while decreasing any fatigue and burnout imposed during working hours. The reasons are as follows:

Savings

Introducing the four-day workweek enables both the company and its workers to save their resources. This is because working one day less means that the utility bills, which include electricity and water usage, for the fifth day of work are not needed (Grosse, 2018). This idea enables the company to save considerably, especially when the company experiences financial difficulties in situations like COVID-19. Workers also benefited from these four-day workweeks as they spend 20 percent less time per week getting to work and returning home if they only must go to work four times a week rather than five (Spencer, 2019). Their transportation expenses are

reduced as well. Overall, both the company and its workers can save their resources during the four-day workweek instead of five (Spencer, 2019).

Productivity

The table below describes the relations between the annual working hours and the Gross Domestic Product (GDP) per capita across developed countries around the world (Roser et al., 2013). GDP describes the output that the country produced over a span of time. With reference to the table, there is a general trend that Asian countries tend to have a high annual working hour per worker at more than 1,700 hours. European countries tend to have the least amount of annual working hours per worker at less than 1,800 hours. However, despite high working hours in Asian countries, the GDP per capita for most Asian countries like Hong Kong, South Korea, and Taiwan are skewed towards the lower GDP per capita. This means that the number of working hours may not necessarily add to the GDP and productivity of the nation.

Countries like Iceland and France are countries that are cultivating four days-eight-hour workweeks. The GDP per capita in these countries is like countries like South Korea, Hong Kong, and Japan. This shows that the number of hours worked may not increase productivity within workers. This might be due to the mental wellness of the workers in the country and psychological pressure that is led by the Efficiency Wage Theory.

Annual working hours vs. GDP per capita

Working hours are the annual average per worker. GDP per capita is measured in constant 2011 international-\$, which means it is adjusted for price differences between countries (PPP adjustment) and for inflation to allow comparisons between countries and over time.

Our World
in Data

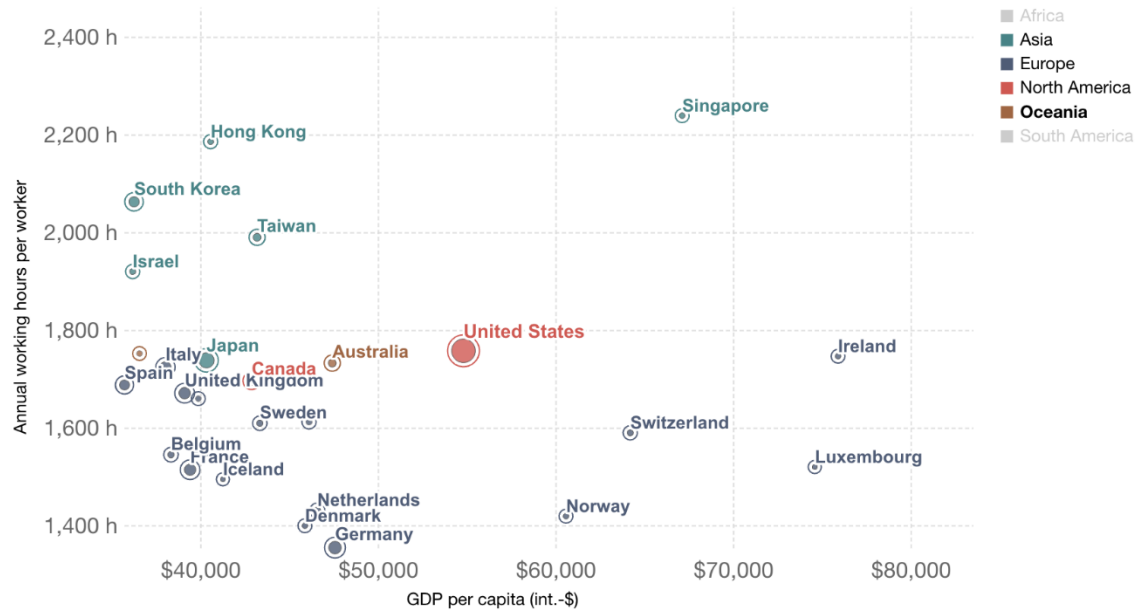


Figure 2. Annual Working hours per worker and Gross Domestic Product per Capita (Roser et al., 2013).

Efficiency Wage Theory

The efficiency wage theory suggests that the increase in wage might lead to an increase in productivity (Pettinger, 2018). The ideology of the efficiency wage theory shows that the higher wages cost will be recuperated through the increase in staff retention and higher labor productivity (MRP) as seen in figure 3 below.

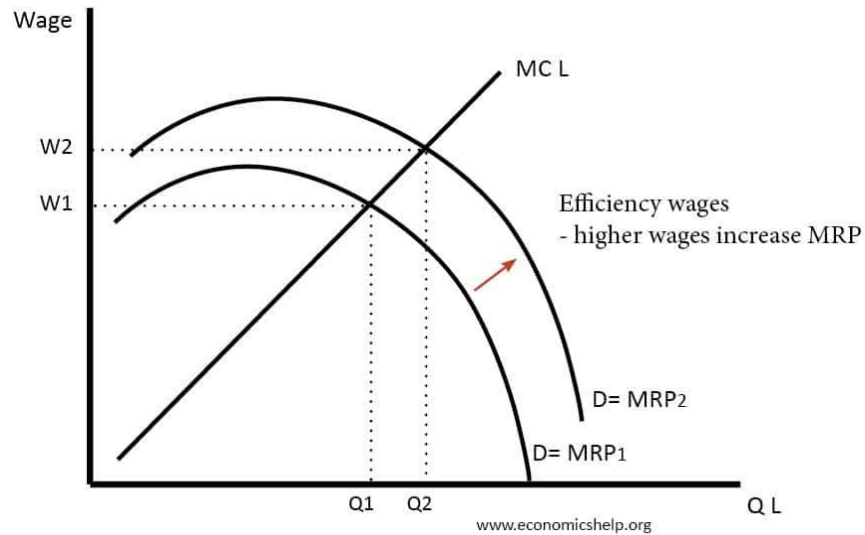


Figure 3. Efficiency-Wage Graph (Pettinger, 2018).

Despite theories and proven studies that have shown that an increase in wage might lead to an increase in productivity, the efficiency wage theory may also result in lower productivity caused by psychological pressure (Sanders & Walia, 2012).

Psychological pressure, an unforeseen by-product of the efficiency wage theory, is led by both distraction theories as well as explicit monitoring theories (Sanders & Walia, 2012). Distraction theories describe that a worker may get distracted from the task at hand when under pressure, which is caused by neurocognitive congestion in the worker. This increases the marginal cost of exerting productive efforts, thus reducing the overall productivity. The explicit monitoring theories describe a worker who is overfocused on the skill process instead of doing the work itself.

Self-Satisfaction

Employees who work four days a week can boost their self-esteem and job satisfaction after gaining the same salary as when they work five days a week (Meah, 2021). These benefits tend to highly improve their performance as their goal in work is to provide the necessary needs

and wants for the employees themselves or for the family that enables them to live comfortably (Fontinha, 2021). Due to decreased fatigue, as compared to a five-day workweek, employees can gain more work-life balance from working and benefit from the quality of life, which is a measure of a combination of income, life expectancy, lower corruption, freedom, social support, and generosity as seen in Figure 3 (Helliwell et al., 2016). Additionally, it is proven that working four days instead of five eases the psychological state of employees as the reduction in the number of workdays can make starting a workweek significantly easier for the employees (Meah, 2021). This will further boost the employee’s self-esteem and job satisfaction to allow them to work more effectively and efficiently by doing the amount of work they usually did in five days only in four days.

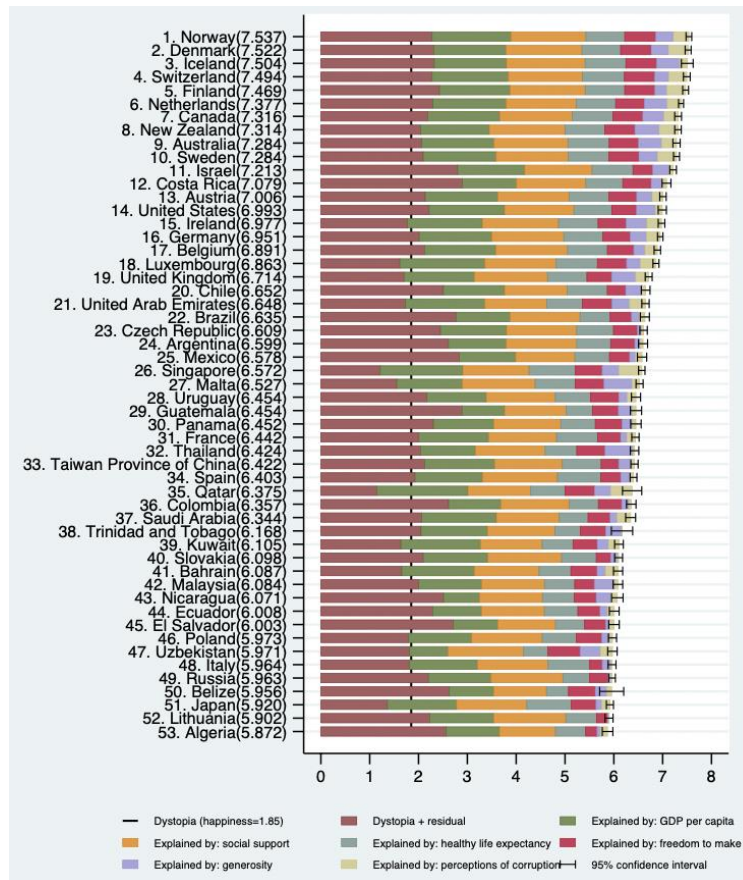


Figure 4. Ranking of Happiness (2014-2016) (Helliwell et al, 2016)

Employee's Mental Health

It should also be taken into consideration that the possibility of a four-day/ eight-hour work week will decrease employees' fatigue and lower their burnout rate from over-working (Meah, 2021). This results in both better concentration and productivity. In this current era, employees tend to get excessively tired at work which reduces their focus and causes harmful effects on their performance (Meah, 2021). As the job gets more demanding and stressful, employees tend to accumulate fatigue, eventually causing them to burn out. Supporting the four-day workweek will benefit employees in giving them more opportunities to rest and allowing them to stay energetic during their shifts while improving their focus and productivity and helping them work more efficiently.

South Korea is a country with the fourth highest suicide rate in the world. Ever since 2017, the suicide rate has been on the rise (So, 2021). This might be tied in with an extremely high annual working hours of more than 2,000 hours (Roser et al., 2013). Through a survey completed, one in three of the respondents had mental health disorders at least once in their lives. This includes depression, social anxiety as well as work-related stress.

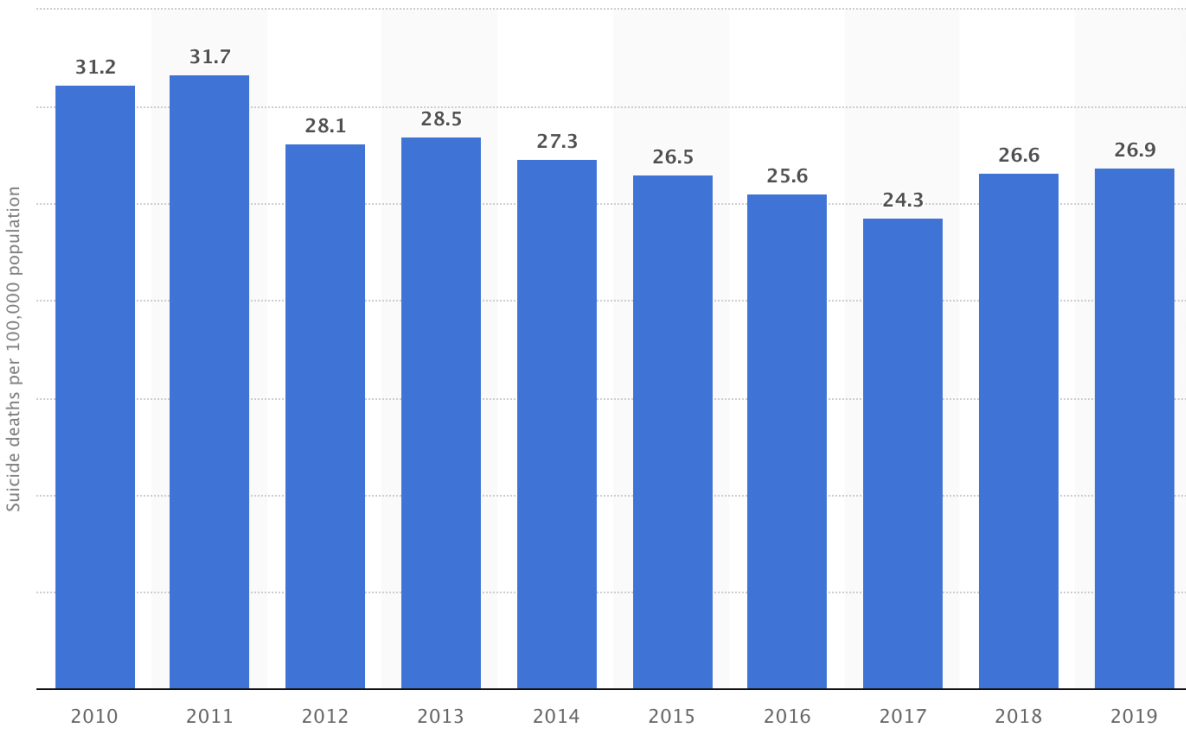


Figure 5. Deaths by suicide per 100,000 resident population in South Korea from 2010 to 2019

(So, 2021)

Study Design

Research Question

The main objective of this research paper is to discover the positive and negative effects of a four-day workweek and whether the positive effects outweigh the negative or vice-versa. The focus of the paper is to look at the positive and negative effects of a four-day workweek and how it affects the productivity and self-satisfaction of employees. Therefore, the research question for this paper would be whether a four-day workweek would benefit the workforce.

Hypothesis

The null hypothesis is that the four-day/eight-hour workweek has no impact on productivity and satisfaction rate in the workforce. The alternate hypothesis is that the four-day/eight-hour workweek increases the productivity and satisfaction rate of the workforce.

H₀₁: four-days/eight-hour workweek has no impact on productivity of the workforce.

H_{A1}: four-days/eight-hour workweek will affect the productivity of the workforce.

H₀₂: four-days/eight-hour workweek has no impact on satisfaction rate in the workforce.

H_{A2}: four-days/eight-hour workweek will affect the satisfaction rate of the workforce.

Data

A cross-sectional study is performed to measure the productivity and satisfaction of the workforce. This is done so by getting data from various developed countries for the year of 2017. As it is difficult to obtain country level statistics from surveys, the data are collected from figures and information provided by different sources such as Statista and Our World In Data. The data will be analysed by using regression models to study the impact of productivity and performance.

Population and Sample

With the focus on the effects of a four days-eight-hour workweek, the population of this study will be the entire world. Aiming at developed countries around the world, a clustered sampling consisting of 25 countries will be used. This includes three countries that have adopted the four days- eight-hour work week, including Iceland, New Zealand and Spain. The rest of the 22 countries are randomly selected from a list of developed countries in the world. Among the sample size of 25 countries, it includes countries from four different continents: Asia, America,

Europe, and Oceania. This is in view of the different lifestyle patterns those individual regions might have.

Variables and Measures

Dependent Variables

Monetary Productivity

When there are fewer working hours per week, more time can be allocated to taking care of personal needs and ensuring burnout does not occur. When these lower-level needs are taken care of, employees can be equipped to perform better at work, thereby improving productivity. Measurements of productivity can be done through the gross domestic product per capita (GDP) and key performance indicators (KPIs).

Human Development Index (HDI)

The Human Development Index (HDI), is an indication of human development through the measurements of life expectancy, literacy rate, and standard of living. When compared to GDP, HDI can accurately measure the quality of life in a country, since GDP is only affected mainly by economic factors. The HDI highlights the state of the people in the country based on social and educational dimensions which may be affected by the hours of work. In general, the higher the HDI of a country, the higher the quality of life which results in higher life satisfaction (Hanania et al., 2018). The satisfaction rate and productivity levels of a country may defer from another country even when the annual working hour is the same, thus possibly causing a misrepresentation in the data. In figure 6 below, it shows the three components and its indicators that lead to HDI (United Nations Development Programme, n.d.).

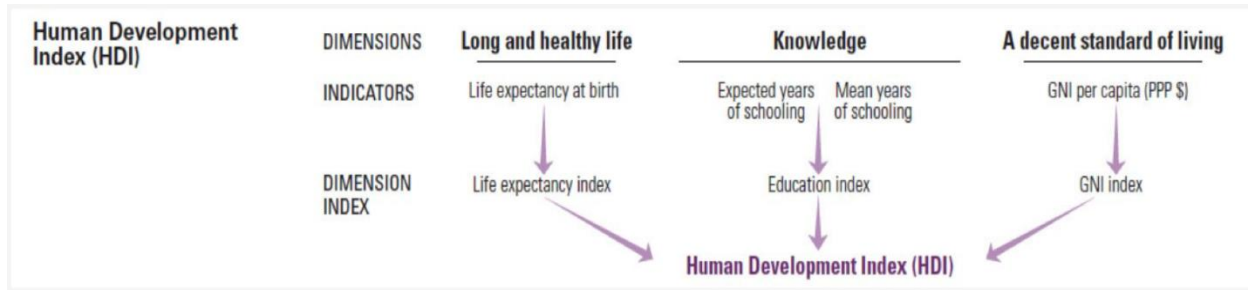


Figure 6. Human Development Index Components (United Nations Development Programme, n.d.)

Satisfaction

Past research has proven that by lowering the number of working hours a week, employee satisfaction, as well as life satisfaction, has improved (Lu, 2020). If we were to increase the number of working hours per week, satisfaction will be affected, proving the relationship between the independent variable and the dependent variable in our paper.

Measurements of satisfaction can be done through surveys and employee average retention rates in each country.

Independent Variable

Working Hours Per Annum

Working hours have been proven to have great impacts on the physical as well as psychological aspects of the human being, as discussed previously in the literature review. It is therefore identified as the independent variable in our paper that changes from country to country, and from one society to the next. Overtime will also be included as it affects the total number of working hours, and therefore affects the dependent variable. The measurement can be taken from either a micro or macro scale depending on the scope of the research. For example, the average hours one employee works in a week in a specific company or the average number of hours an employee works in a week in a specific country.

Control Variables***Life Expectancy***

Developed nations generally have longer life expectancies. The effect of longer life expectancies causes the general retirement age to increase, leading to an aging workforce in most work sectors. To limit the scope of focus of the study, the age of the participants should be considered an independent variable as these demographic individuals would have been working in similar conditions as with the younger demographic individuals. As the study focuses on the four-day work week, the age of individuals and the perception of benefits would skew the dataset.

Country Population

The countries' population is a factor that can affect the overall productivity and satisfaction in the workforce. A higher population equates to a higher number of working adults in the workforce. With a larger pool of people, supply of workers increases, thus increasing productivity. As the study focuses on the four-day work week, it is important to keep the population of people constant when comparing between countries as it might skew the data and conclusions. Research done by Zgheib et al. (2006) have shown that the population of a country affects the GDP per capita of the country. Thus, the country population is a control variable that is added to study the effects on productivity and satisfaction.

Variables Not Included***Minimum Wage***

Wages are not set at the same levels among the developed nations. For example, Sweden, Denmark, Iceland, Norway, Singapore, and Switzerland do not set legal minimum wages, whereas countries such as Luxembourg, Australia, France, New Zealand, and Germany do set

minimum wages by law. However, since these minimum wages governs the salary paid towards the vulnerable low-skilled and or part-time workers, who are mostly paid by the hour, it is anticipated that the data collated may not be credible since individuals may not accurately report the number of part-time jobs and or number of hours that they have worked, thus report a misleading number of hours per workweek, skewing the data.

Data Collection Methods

To conduct our research, we will need to collect data that is on the macro scale for example, in terms of regions or countries/nations. The data will be collected from public databases and free sources published online, as well as past documentation and records of studies prior to starting our research. We will be using secondary data like GDP per capita, life satisfaction rate, human development index (HDI), and annual working hours from 25 developed countries around the world through websites like Our World in Data and Statista that provides cross-sectional data from the year 2017. In table 1 below, we can see the descriptive statistics of the data that we will be analysing. The reason as to why the research is plausible is because data dependent variable is affected by the independent variable.

Annual Working Hours

The Annual Working Hours of each country were extracted from the database of Our World In Data which is from the Penn World Table 9.1 (2019).

GDP per Capita

The GDP per capita of each country was extracted from the database of Our World In Data which was compiled in the 2021 revision of the World Development Indicators - World Bank.

Life Satisfaction

The Life Satisfaction of each country was extracted from the database of Our World In Data which utilized the World Happiness Report (2021) findings to present its data. Life satisfaction was measured by the average of survey responses to the Cantril ladder question: “Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?”

Life Expectancy

Life expectancy figures were extracted from the database of Our World In Data which data was compiled in the 2019 revision of the United Nations Population Division.

Human Development Index

Human Development Index (HDI) of each country were extracted from the database of Our World In Data which utilized the United Nations Development Programme Study 2017 (UNDP 2017) findings to present its data. The HDI is an index that uses three key dimensions of human development to measure. The three key dimensions are health, education, and standard of living.

Country Population

The Population of each country was extracted from the database of Our World In Data which was compiled by Gapminder, History Database of the Global Environment (HYDE), and United Nations.

<i>Conum</i>		<i>Annual Working Hours</i>		<i>GDP per capita (\$)</i>			
Mean	13	Mean	1691.2	Mean	54938.444		
Standard Error	1.47196014	Standard Error	45.7615923	Standard Error	3619.70961		
Median	13	Median	1686	Median	50442.3		
Mode	#N/A	Mode	#N/A	Mode	#N/A		
Standard Deviation	7.35980072	Standard Deviation	228.807962	Standard Deviation	18098.5481		
Sample Variance	54.1666667	Sample Variance	52353.0833	Sample Variance	327557442		
Kurtosis	-1.2	Kurtosis	0.61338991	Kurtosis	3.74294496		
Skewness	0	Skewness	0.86145554	Skewness	1.84753647		
Range	24	Range	884	Range	78546.1		
Minimum	1	Minimum	1354	Minimum	33761.9		
Maximum	25	Maximum	2238	Maximum	112308		
Sum	325	Sum	42280	Sum	1373461.1		
Count	25	Count	25	Count	25		
<i>Life Satisfaction</i>		<i>Life Expectancy</i>	<i>Human Development Index (out of 1.00)</i>		<i>Population (Million)</i>		
Mean	6.8152	Mean	82.0156	Mean	0.9188	Mean	39.3744
Standard Error	0.13219445	Standard Error	0.35926503	Standard Error	0.00433282	Standard Error	13.5384728
Median	6.9	Median	82.21	Median	0.92	Median	9.9
Mode	#N/A	Mode	82	Mode	0.93	Mode	#N/A
Standard Deviation	0.66097226	Standard Deviation	1.79632514	Standard Deviation	0.0216641	Standard Deviation	67.6923642
Sample Variance	0.43688433	Sample Variance	3.226784	Sample Variance	0.00046933	Sample Variance	4582.25617
Kurtosis	-0.8587031	Kurtosis	6.72819815	Kurtosis	0.82901744	Kurtosis	13.7844082
Skewness	-0.6305988	Skewness	-2.1335286	Skewness	-1.0084806	Skewness	3.44241884
Range	2.1	Range	8.98	Range	0.09	Range	324.75
Minimum	5.5	Minimum	75.51	Minimum	0.86	Minimum	0.33
Maximum	7.6	Maximum	84.49	Maximum	0.95	Maximum	325.08
Sum	170.38	Sum	2050.39	Sum	22.97	Sum	984.36
Count	25	Count	25	Count	25	Count	25

Table 1 Descriptive Statistics

Data Analysis Methods

Regression Analysis (Data Set)

Regression analysis is used in this study to infer the relationship between both independent and dependent variables. The study from the usage of regression analysis will provide information on the significance of each variable on productivity and satisfaction of the workforce in a country. Additionally, the statistics received from the analysis of regression will show the coefficients, which will determine if any additional unit on the variable will cause a positive or negative impact.

To study the relationship between the dependent variable of productivity and the other independent variable which includes the Annual Working Hours and the population, a regression

analysis will be carried out to study the significance of how the number of working hours will affect the productivity and satisfaction of the workforce.

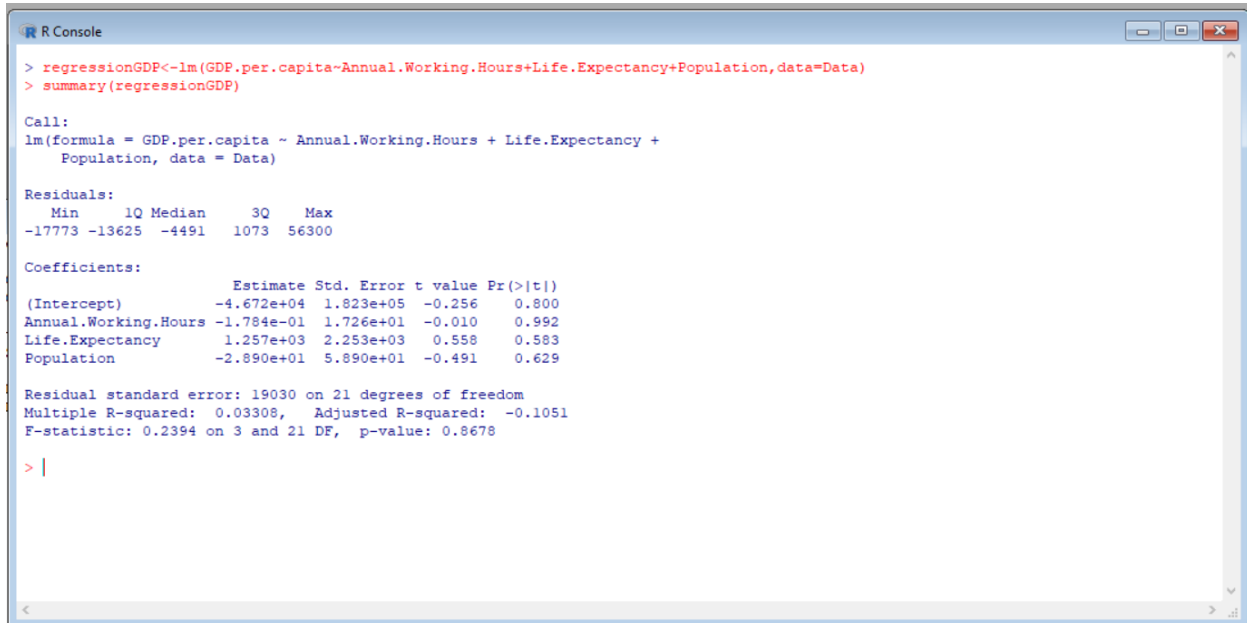
This forms the regression equation of:

$$y_{1,2,3} = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \epsilon_0$$

Where y_1 is the dependent variable of productivity measured by the GDP per capita, y_2 is the dependent variable of satisfaction measured by a life satisfaction scale out of 10. y_3 is the dependent variable of Human Development Index. ϵ is an error term or residual. Even though the main aim of the study is to study how the number of working hours affects both productivity and satisfaction, other independent variables are collected to study the effect on the dependent variables. Therefore, other independent variables like life expectancy and country population are factored in within the formula.

The study of the Regression analysis causes us to focus on the P-value, coefficients as well as adjusted R-square. The P-value of every variable determines if the variable is statistically significant. With a significance value of 0.05, any P-value below the significance value will mean that the variable is statistically significant. A variable that is statistically significant means that we reject the null hypothesis of the variable will not affect the dependent variable of either productivity or satisfaction. On the other hand, a variable that has a P-value higher than the significance value of 0.05 means that the variable is not statistically significant. A variable that is not statistically significant will mean that we do not reject the null hypothesis. Next, the coefficients would determine the impact of the independent variable on the dependent variable. A positive coefficient would mean that an increase in unit of the independent variable would positively increase the effects of the dependent variable. A negative coefficient would mean that an increase in unit of the independent variable would negatively affect the dependent variable.

Lastly, the adjusted R-square is studied as it signifies the goodness of fit. The value of R-square will increase naturally when the number of independent variables increases, thus we look at the adjusted R square to see how well the model explains the data.



```

R Console
> regressionGDP<-lm(GDP.per.capita~Annual.Working.Hours+Life.Expectancy+Population,data=Data)
> summary(regressionGDP)

Call:
lm(formula = GDP.per.capita ~ Annual.Working.Hours + Life.Expectancy +
    Population, data = Data)

Residuals:
    Min       1Q   Median       3Q      Max
-17773 -13625 -4491  1073  56300

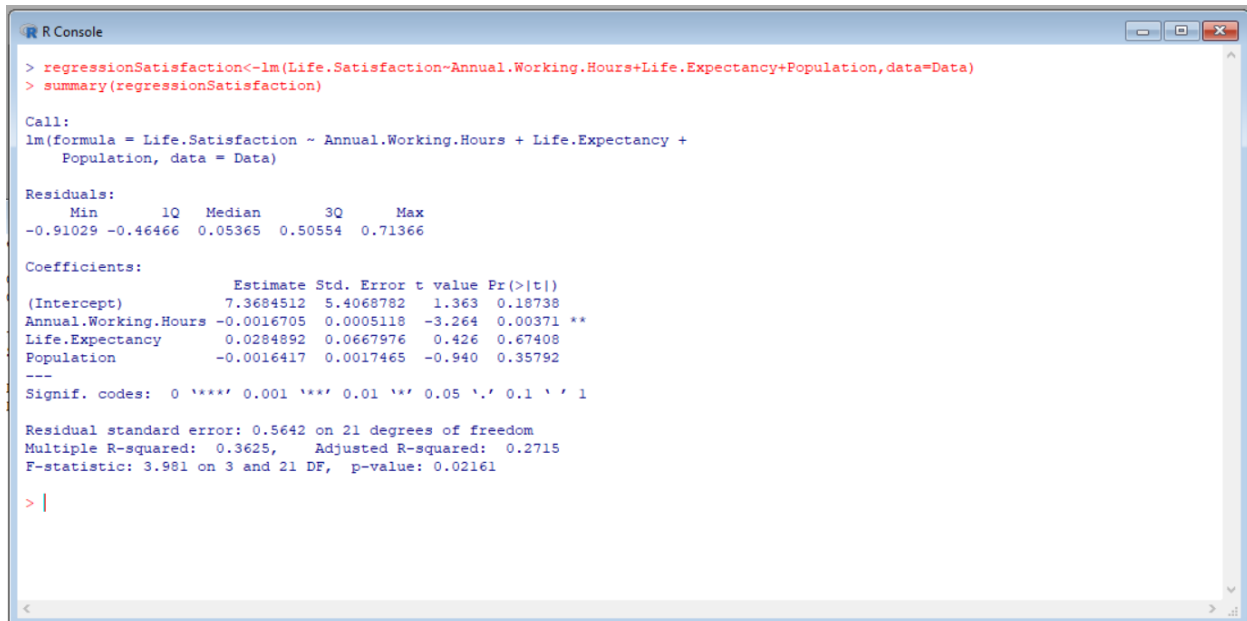
Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) -4.672e+04  1.823e+05  -0.256   0.800
Annual.Working.Hours -1.784e-01  1.726e+01  -0.010   0.992
Life.Expectancy      1.257e+03  2.253e+03   0.558   0.583
Population          -2.890e+01  5.890e+01  -0.491   0.629

Residual standard error: 19030 on 21 degrees of freedom
Multiple R-squared:  0.03308,    Adjusted R-squared:  -0.1051
F-statistic: 0.2394 on 3 and 21 DF,  p-value: 0.8678

> |

```

Figure 7. Regression summary on the GDP per capita



```

R Console
> regressionSatisfaction<-lm(Life.Satisfaction~Annual.Working.Hours+Life.Expectancy+Population,data=Data)
> summary(regressionSatisfaction)

Call:
lm(formula = Life.Satisfaction ~ Annual.Working.Hours + Life.Expectancy +
    Population, data = Data)

Residuals:
    Min       1Q   Median       3Q      Max
-0.91029 -0.46466  0.05365  0.50554  0.71366

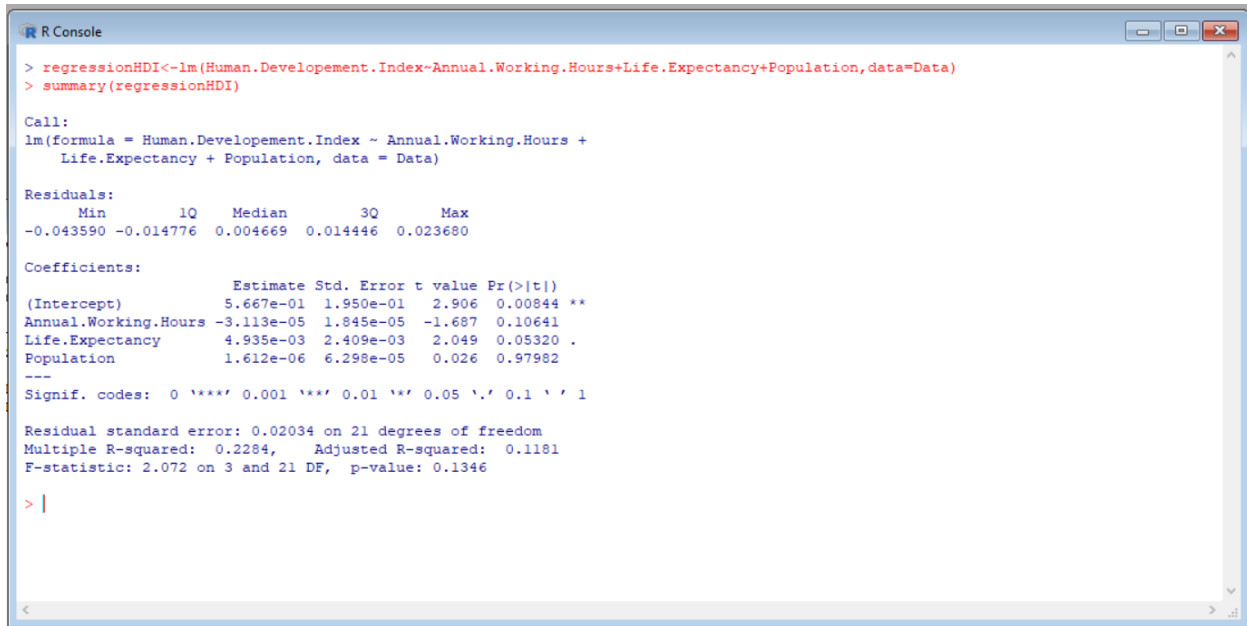
Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  7.3684512  5.4068782   1.363  0.18738
Annual.Working.Hours -0.0016705  0.0005118  -3.264  0.00371 **
Life.Expectancy      0.0284892  0.0667976   0.426  0.67408
Population        -0.0016417  0.0017465  -0.940  0.35792
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5642 on 21 degrees of freedom
Multiple R-squared:  0.3625,    Adjusted R-squared:  0.2715
F-statistic: 3.981 on 3 and 21 DF,  p-value: 0.02161

> |

```

Figure 8. Regression summary on the Life Satisfaction Rate



```

R Console
> regressionHDI<-lm(Human.Development.Index~Annual.Working.Hours+Life.Expectancy+Population,data=Data)
> summary(regressionHDI)

Call:
lm(formula = Human.Development.Index ~ Annual.Working.Hours +
    Life.Expectancy + Population, data = Data)

Residuals:
    Min       1Q   Median       3Q      Max
-0.043590 -0.014776  0.004669  0.014446  0.023680

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  5.667e-01  1.950e-01   2.906  0.00844 **
Annual.Working.Hours -3.113e-05  1.845e-05  -1.687  0.10641
Life.Expectancy    4.935e-03  2.409e-03   2.049  0.05320 .
Population        1.612e-06  6.298e-05   0.026  0.97982
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.02034 on 21 degrees of freedom
Multiple R-squared:  0.2284,    Adjusted R-squared:  0.1181
F-statistic: 2.072 on 3 and 21 DF,  p-value: 0.1346

> |

```

Figure 9. Regression summary Human Development Index

Conclusion

Although this study has the following limitations and needs to be supplemented by further future studies, based on the regression analysis, GDP has a p-value of 0.8678, Life Satisfaction p-value is of 0.02161, and HDI's P-value is of 0.1346. The data concludes the null hypothesis that the four-days/eight-hour workweek will affect the productivity is not to be rejected, however there is an impact on the satisfaction rate of the workforce.

Recommendation

This research paper has studied the effect of working hours on the productivity of the country as well as the satisfaction rate of the country. As this paper focuses on country wide data, the authors of this paper acknowledge that different countries' governments operate differently and therefore have different societal norms. Due to time constraints and limited

resources, some factors were also not taken into consideration. There are other factors that must be controlled to ensure accurate and reliable comparisons, including the female labor participation rate of the country, and education level can be included further in future research. First, our findings may have external validity issues; we used a single country, South Korea, as the sample. Thus, we should be careful when generalizing these findings to other cultural areas. There is also the possibility that culture at a national level may influence the impact of working hours on employees' life satisfaction (Spector et al., 2002; Wharton & Blair-Loy, 2006), which should be considered in future research.

The study has a potential endogeneity problem due to reverse causality, even though a longitudinal data by (Rudolf, 2014, p. 1141) was used. If changes in working hours are driven partly by satisfaction or dissatisfaction with workers' life subdomains (i.e. work, family, and leisure) and their overall life satisfaction (Rothbard & Edwards, 2003), then our estimates are not free from potential endogeneity bias. In the case of South Korea, the reverse causality problem might not be that serious – it is not easy for employees to choose their own working hours. However, it is recommended that future studies use instrumental variables to solve the endogeneity problem.

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