WORKING PAPER SERIES

Preference to work and its effects on economic growth and happiness

Jim Yongtao Jin and Geethanjali Selvaretnam

Preference to work and its effects on economic growth and happiness

J. Jin[1] and G. Selvaretnam[2]

Abstract

There are circumstantial and researched evidence that people's preferences to work differ and change. We depart from partial equilibrium models which show decisions for labour and leisure depend on their relative prices. This paper presents a simple general equilibrium framework to show that labour hours are determined by the preference to work and are independent of real wages and consumption. Moreover, the theoretical model enables us to estimate the preference to work at the macro level. A panel data analysis across countries for the years 1990 – 2018 shows with statistical significance that preference to work has been on the downward trend and has a negative relationship with GDP per capita and the ratio of wage income to GDP. Results also show that higher the preference to work, higher the GDP growth rate and lower the reported level of happiness.

Keywords: work, labour hours, preference to work, economic growth, happiness, general equilibrium

JEL: J22, O4, I31, D5

---

[1] University of St Andrews, School of Economics & Finance, 1 The Scores, St Andrews KY16 9AL; email: jyj@st-andrews.ac.uk; Tel: 0044 (0)1334 462447.
[2] University of Glasgow, Adam Smith Business School, University Avenue, G12 8QQ; email: Geethanjali.Selvaretnam@glasgow.ac.uk; Tel: 0044 (0)141 330 4496

1. Introduction

There are various factors which have been shown to influence economic growth in a country. In the existing literature many papers have investigated such variables[3], for example education, social capital, R&D investment, infrastructure, life expectancy, fertility rate, level of corruption, financial markets, saving, gender equality, government consumption, economic equality, trade liberalisation, foreign direct investments, legal framework, civil peace, research and technological progress etc. Holzer (2008) is one of many papers to point out that an important component of economic growth is the productivity of the labour force, which is influenced by education and training. Several papers have shown how financial incentives increase worker productivity[4]. A recent paper, Kopytov et al (2020), shows that one of the factors causing the decrease in working hours is the reduction in the cost of recreational goods and services. An important factor which has not been explored in depth is people's preference towards work and leisure. This paper aims to address this issue.

There is circumstantial observation and opinion that different groups of people value leisure and work differently. For instance, the Japanese are considered particularly "hard working", famously known for paying little attention to their private and family life. Hamada and Kurosaka (1986) examines the Japanese labour market in 1970 - 1983 and reasons for consistently low unemployment rate despite fluctuations in the economy. His finding highlights people's willingness to work long hours, commitment to work, culture of work ethic even if wages fluctuate considerably. In recent years, South Koreans are known to work the longest hours among developed countries – is this because they are workaholics or because they have to work more in order to earn enough like the Mexicans and Costa Ricans who work even longer hours on average?[5]

There is a general opinion that Germans have a strong work ethic compared to their European counterparts stemming from Protestant work ethic[6], although this is not a claim having robust

---

[3] Acemoglu and Johnson(2007), Affaro et al (2004), Alesina and Rodrik (1994), Barro (1997, 2000), Basu and Weil (1998), Bils and Klenow(2000), Carrol et al (1997), Forbes (2000), Frankel and Romer (1999), Galor and Weil (1996), Hall and Jones (1999), Hanushek and Kimko (2000), Jones (1995), Levine (1999), Mauro (1995), Persson and Tabellini(1994), Strauss and Thomas (1998), Temple and Johnson (1998), Wacziarg and Welch (2008).

[4] Bellamare and Shearer (2009); Booth and Frank (1999); Heckman (1993); Klette (1999); Rice et al (2006).

[5] https://edition.cnn.com/2018/11/04/asia/korea-working-hours-intl/index.html;
https://www.bbc.com/worklife/article/20190809-deskterior-the-ornately-decorated-desks-of-south-korea

[6] https://www.careeraddict.com/5-work-habits-worth-learning-from-the-germans;
https://www.welcometothejungle.com/en/articles/german-work-culture;
https://www.dw.com/en/study-finds-that-germans-work-more-than-most-europeans/a-4529694

research backing for recent times. Stam et al (2013) perform a regression analysis of 44 countries using European Values Studies 2008 about work ethic, defined as the 'conviction that work is a moral duty', and find that work ethic is lower in countries which are richer, more educated and having more social welfare, while it is higher in countries which are Islamic/ Orthodox and ex-communist. The results could have been different if the definition of work ethic was different. Baby boomers are considered to have a high level of work ethic. This opinion is not only anecdotal but also researched, comparing them to generation X and millennials.[7] These papers relied on self-reports about the values people attached to work and leisure. It shows that people's utility from leisure has increased while the satisfaction from factors related to work has decreased. However, in some sectors such as the IT, millennials are found to be willing to work longer hours. Following the 2008 financial crisis, some countries have survived better than others. Some commentators imply, although there is not much scientific evidence, that the Mediterranean countries are not as highly driven to work as their northern European counterparts.[8] This could be due to several factors, including the crucial factor of the 'availability of jobs' and productivity.

Ashraf and Galor (2013) claim that Africans, who are far too genetically diverse, and native Americans, who are far less genetically diverse, are less productive compared to their counter parts in other parts of the world. Their opinion is based on scarce empirical data and strongly criticized by other scholars, (Gelman, 2013; Guedes et al, 2013; Leviox and Parent, 2018). Economists often attribute differences in work ethic to economic incentives, probably supported by free market mechanisms. If this were true, Japanese up to the 1990s should be the least hard working given their permanent job security and seniority based promotion, followed by Germans who enjoyed a similar but less extreme system, then the baby boomers, and finally dominated by the current American and British generation under rather strict competition pressure and excessive rewards. This is quite the opposite to the perception about the work ethic of these groups of people. Some economists point to cultural influence to explain this difference. Protestantism (Weber, 1905) and Confucianism are often cited as examples. These explanations do have merit, but also seem to overlook other facts. Catholic Bavarians in southern Germany are hardly differentiable with the northern Protestant Prussians in term of working ethics. China not only suffered a long stagnation under Confucian influence, but also

---

[7] Cennamo and Gardner (2008), Davis et al (2006), Gursoy (2013), Lancaster and Stillman (2002), Meriac et al (2010), Smola and Sutton (2002), Twenge et al (2010), Wallace (2006).
[8] Ozturk and Sozdemir (2015), Chen et al (2019), Pop (2011), Thompson (2012), Coleman (2015), Yglesias (2011)

saw its hard-working spirit quickly weakened among the "rich second generation" after decades of rapid economic growth. The work ethic in China has been discussed in several papers, (Haslett and Leidel, 2015; Hruby, 2018; Li and Madsen, 2009). There appears to be certain attitude to work, neither related to short run stimulation such as money, nor permanently set for a long period as culture.

There are findings about different groups of people responding to financial incentives differently in the labour market. Heckman (1993) points out that the decision of whether to participate in the labour market is different to how many hours of labour to supply. Participation is more income elastic than hours of work elastic. Number of hours is usually fixed for most full-time jobs. The groups that show considerable differences in the labour market are men and women; different age groups; marital status; number of children; regions; race, education, experience in labour market and so on. Hellerstein et al (1999) find that given the wage, workers who have never been married are less productive; younger workers are more productive; women were more productive; however, there was no difference across races. Holzer (2008) finds that women are more productive despite having lower wages. Elvira and Town (2002) used data from a large US company to show that the productivity of black workers was lower than that of whites, and furthermore productivity was lower when the race of supervisor and workers was different. It is important to stress that they had not controlled for education and training, which plays an important role in productivity.

Bick et al (2018) find that people in rich countries generally work significantly fewer hours than their counterparts in poor countries. Bick et al (2019) further evaluate the impacts from the income effect and tax and welfare systems, and conclude the former is dominating as higher income raises preference for leisure. However, in their analysis, the utility function remains the same, thus the internal preference of leisure is the same for people in rich and poor countries.

Our research in this paper does not consider racial or cultural differences, if they ever exist, in work ethic. The primary objective of this research project is to explore the issue of *preference to work* across societies and across time periods. We will investigate this through the relative value of leisure compared to work – i.e. how much leisure is a worker willing to sacrifice in order to earn for consumption. The existing literature has concentrated on labour productivity and labour income to explore labour hours, taking for granted that the preference for labour and leisure remain unchanged in the utility function. We put forward a simple general

equilibrium model to find the preference to work together with arguments as to why this is a sensible approach. The objectives of this research paper can be summarised as follows:

1. Present a general equilibrium model where the firms offer jobs at given wages, and the workers choose how many hours they want to work, taking into consideration how much they value leisure. This model will provide us with an appropriate indicator of workers' preference to work; a way to measure this indicator at a macro level and how it influences the economy.

2. Using the predictions of the theoretical model, estimate the value of work relative to leisure across countries for certain years.

3. Using the estimated variable, preference to work, perform an empirical analysis about how it influences economic growth and happiness.

4. Investigate what factors can affect the preference to work.

This research project will be a valuable addition to the literature by (1) providing a proxy for 'preference to work' which can be estimated for countries across time and (2) providing evidence through a panel data econometric analysis as to how preference to work influences economic growth and level of happiness. This method would enable future research on how preference to work could affect countries' economic recovery after shocks such as COVID 19 and whether such shocks affects the preference for work itself.

2. Theoretical Model

We consider a simple general equilibrium model. An economy consists of n consumers, each consumer i has a Cobb-Douglas utility function,

$$u_i = c_i^\alpha (T - h_i)^{1-\alpha} \tag{1}$$

where c_i is consumption, T is the total time available, h_i is the working time and $T - h_i$ is time for leisure. The utility function (1) implies that a 1% increase in consumption can be traded-off by $\frac{\alpha}{1-\alpha}$% reduction in leisure time. When $\alpha = 0.5$, the trade-off is one-to-one, and we can say that he valuates the money and leisure equally. If $\alpha = 2/3$, the representative consumer values 1% change in consumption as equivalent to 2% change in his leisure time. As α rises to 1, he becomes completely insensitive to leisure, and as α falls to 0, he becomes money insensitive. We recognise that α captures the preference for consumption, in other words, preference to work relative to leisure.

This simple utility function captures several common but often overlooked features regarding attitude to work. For instance, an increase in real wages might encourage working because of the higher opportunity cost of leisure. However, it shows that as the consumption rise with wages, the marginal utility of consumption will fall. Thus the relation between wage and working time is not clear. On the other hand, the marginal utility of leisure rises with consumption, and thus higher income makes leisure more attractive. This factor again should imply that higher income reduces the incentive to work, but this has to be compared with the higher opportunity of leisure. The conclusion must be based on a general equilibrium analysis.

The economy has a Cobb-Douglas production function with constant returns to scale, given labour L and capital K as two chosen inputs:

$$f(L,K) \ = \ AL^\beta K^{1-\beta}, \ \ 0 < \beta < 1. \tag{2}$$

where A is constant and determined by technology and natural resources. The economy has capital K, while the labour employed L must match with the labour supply which is variable. Given wage rate w, interest rate r and the output price p, competitive firms choose L and K to maximize the net profit

$$\pi(L) = pAL^\beta K^{1-\beta} - wL - rK. \tag{3}$$

The first-order conditions are given by (4) and (5):

$$\frac{w}{p} = \beta A \left(\frac{K}{L}\right)^{1-\beta} \tag{4}$$

$$\frac{r}{p} = (1-\beta)A \left(\frac{L}{K}\right)^{\beta} \tag{5}$$

Hence the optimal capital/labour ratio is:

$$\frac{K}{L} = \left(\frac{1-\beta}{\beta}\right)\frac{w}{r} \tag{6}$$

Labour income share in total income, β

From (6) we derive the ratio of the total wage earnings to the total revenue,

$$\frac{wL}{wL + rK} = \beta \tag{7}$$

6

Notice that (7) shows that β is the labour income share in GDP. A higher β indicates a more significant contribution from labour, and thus a higher share of labour income. Many studies place the share of labour income in GDP for the US economy between 75% and 60%. In recent years, the ratio of labour income in the total output, i.e. β, has been declining in most countries, indicating less reliance on labour for production.

General equilibrium condition

Using (5), $A(L/K)^\beta = r/(1 - \beta)p$, the optimal output would be $f(L, K) = rK/(1 - \beta)p$, where r is the interest payments (dividends) received by capital owners. The dividends are distributed to capital owners who are also consumers, according to their capital ownerships. We indicate consumer i's ownership by $\theta_i \geq 0$, with $\sum_{i=1}^{n} \theta_i = 1$. Then consumer i's budget constraint would be $c_i p = w h_i + \theta_i rK$, which can be written as

$$h_i = \frac{pc_i - \theta_i rK}{w} \tag{8}$$

Using (1) and (8) each consumer chooses c_i to maximize his utility,

$$u_i = c_i^\alpha \left[T - \frac{(pc_i - \theta_i rK)}{w} \right]^{1-\alpha} \tag{9}$$

The first-order condition for the utility maximization, $\alpha(wT + \theta_i rK - c_i p) = (1 - \alpha)c_i p$, implies the optimal consumption as:

$$c_i = \frac{\alpha}{p}(wT + \theta_i rK) \tag{10}$$

Summing up (10) for all n consumers, we get the total consumption, which can be written as $\alpha(wnT + rK)/p$. In equilibrium, the total demand for consumption must be equal to the total output $rK/(1 - \beta)p$. Hence, we have the equilibrium condition:

$$\alpha(wnT + rK) = \frac{rK}{1 - \beta} \tag{11}$$

Equilibrium working time

Combining (11) with (6) to substitute out w/r, we solve for the average equilibrium working time per worker,

$$\frac{L}{n} = \frac{\alpha\beta}{1-\alpha+\alpha\beta} T \tag{12}$$

Surprisingly, the average working time in (12) is independent of real wages, Capital, GDP and consumption levels. It is also independent of parameter A in the production function, which indicates the technology and know-how beyond labour and capital. The equilibrium working time is found to be a fixed fraction of T, determined by α and β which are the preference for work in the utility function and the significance of labour contribution in the production technology respectively.

For given α and β, our result shows that average working time should stay constant as economies grow.[9] This seems inconsistent with empirical evidence that working hours tend to be lower in rich countries. However, this apparent inconsistency only exists if β remains fixed, which is not true in reality. The existing labour economics models focus on relative prices between consumer goods and leisure to explain working hours and assume utility functions to be fixed. Here we take a different approach using a general equilibrium framework to show that working time only depends on α and β. Since β is generally higher in rich countries, the difference in preference to work can be explained by β instead of relative prices and real wages. This directly raises a question that the preferences in the utility function may count for some observed changes in working time.

The average equilibrium working time $\frac{\alpha\beta}{1-\alpha+\alpha\beta} T$ increases with α. The average equilibrium leisure time, which works out to be $\frac{1-\alpha}{1-\alpha+\alpha\beta} T$, decreases with α. When people have stronger preference for consumption over leisure, they are willing to work more. Moreover, the fraction $\frac{\alpha\beta}{1-\alpha+\alpha\beta}$ rises with β. When labour plays a larger role in production, the equilibrium working time rises.

We define T as the physical maximum time, which is 24 hours a day so that the leisure time of $T-h$ includes the time taken for sleeping, eating, family time, and other leisure activities. Using equation (12) and assuming $\beta = \frac{1}{4}$, the proportion of T that is spent working would be

---

[9] If we allow more complicated utility functions, this result may not hold precisely. However, we can be confident that average working time would not be dramatically affected by other factors, since the Cobb-Douglas function represents basic interactions in a simple general equilibrium set up.

$\frac{\alpha}{4-3\alpha}$. If $\alpha = 2/3$, the representative consumer values 1% change in consumption as equivalent to 2% change in his leisure time, and the ratio becomes 1/3. Given $T = 8760$ hours a year, the average working time would be 2920 hours a year, close to 56 hours a week. If the preference for leisure is higher so that $\alpha = \frac{1}{2}$, the proportion of T that is spent on work is 1/5 and the average working time would be 1754 hours a year. Assuming 47 working weeks a year (excluding holidays), the weekly working hours would be 37.3, close to current levels in Western Europe. In the case of a higher $\beta = \frac{1}{3}$ and $\alpha = \frac{1}{2}$, the proportion increases to ¼ and the average working time increases to 2190 hours a year.

Equilibrium wages and total output

To further illustrate the real driving force for declining working hours in rich countries, we demonstrate that increasing real wages and average consumption may not affect working time, when capital and technology rise but α and β remain constant. We substitute out L from (12) into (4) to find the equilibrium real wage, given by (13). Equilibrium level of real total output per capita is presented by equation (14), after substituting L from (12) into (2).

$$\frac{w}{p} = \beta A \left(\frac{(1 - \alpha + \alpha\beta)K}{\alpha\beta nT} \right)^{1-\beta} \tag{13}$$

$$\frac{f(K)}{n} = A \left(\frac{K}{n} \right)^{1-\beta} \left(\frac{\alpha\beta T}{1 - \alpha + \alpha\beta} \right)^{\beta} \tag{14}$$

The equilibrium level of real wages clearly increases with *A* and *K* as expected. Equation (14), which captures the average consumption of the economy, also increases with *A* and *K* as expected. Richer countries should have higher real wages and higher average consumption than poor countries due to more abundance in capital and advanced technology. We saw in (12) that none of these factors affect L/n, so we cannot explain fewer working hours in richer countries by higher income although it can be correlated with less working time. We conclude that the preference to work has a role to play.

Preference to work, α

A key aspect of this research article is to provide a measurement for preference to work. According to the utility function in the theoretical model, α indicates a representative agent's

relative preference between consumption and leisure, i.e. preference to work. Rearranging equation (12), we obtain the estimate of α as a function of β and h.

$$\alpha = \frac{1}{\beta \left(\frac{T}{h} - 1\right) + 1}. \tag{15}$$

In the next section. we estimate the preference for work for different countries across time using data which represent β and h.

3. Empirical Analysis

3.1. Empirical model and data

We use panel data for our analysis, including as many countries as possible according to data availability for the period 1990 - 2018. After estimating the preference for work for each country and year, the factors affecting the preference for work is analysed, followed by the effect of this preference on economic growth and happiness.

Estimating Preference for Work

According to the theoretical model α can be considered the relative preference between consumption and leisure of a representative agent in an economy. We use equation (15) to estimate α , which is a function of β and h, with data on labour income share in GDP and average labour hours of working people respectively. Since we do not have a priori a natural choice of T, we use its upper limit for seven days which is 168 hours.

Factors affecting Preference for work

The estimated α is the dependent variable in the panel data regression model in (16) below and is used to analyse the data to understand how some explanatory variables affect α. The model uses the natural log of α denoted by $Ln\ \alpha$, so that we can interpret the results sensibly.

The first explanatory variable is β, which is the percentage of GDP that is labour income. We have used the natural log of β denoted by $Ln\ \beta$, which seems appropriate after checking the relationship between $Ln\ \alpha$ and $Ln\ \beta$. The natural log of GDP per capita, $LnGDPpc$, is included to check whether preference to work is affected by how rich a country is. The variable $Year$ is included to check whether there is a significant trend over time.

$$Ln\ \alpha_{it} = b_0 + b_1 Ln\ \beta_{it} + b_2 LnGDPpc_{it} + b_3 Year + u_{it} \tag{16}$$

Effect of α on Economic Growth and Happiness

Using the estimated α as an explanatory variable, we perform a panel data analysis with growth rate of GDP per capita denoted by $GDPgr$ as the independent variable, controlling for other explanatory variables such as average school years, life expectancy, inflation, percentage of exports and imports on GDP, denoted by $AvgSchoolyrs$, $Lifexp$, $Infl$ and $XMgdp$ respectively. We included $LnGDPpc_{it}$ considering the influential Solow (1956) model that poorer countries should grow at a faster rate.

We expect to find a significant positive relation between α and $GDPgr$. If so, we can say that a lower preference for relative leisure in favour of work by its people will result in positive economic growth in the country. This regression model is given in (17).

$$GDPgr_{it} = b_0 + b_1\alpha_{it} + b_2Schoolyrs + b_3Lifexp_{it} + b_4Infl_{it}$$
$$+ b_5LnGDPpc_{it} + b_6LnGDPpc_{it}{}^2 + b_7XMgdp_{it} + b_8Year_{it} + u_{it} \quad (17)$$

Finally, we carry out a similar analysis with the independent variable being a Happiness index as shown in the model (18), denoted $Happiness$. This index is according to the self-reported sense of happiness and life satisfaction in the 'Cantril Ladder' where 0 being the worst possible life and 10 being the best.

$$Happiness_{it} = b_0 + b_1\alpha_{it} + b_2Schoolyrs + b_3Lifexp_{it} + b_4Infl_{it} + b_5LnGDPpc_{it}$$
$$+ b_6Gini_{it} + b_7Year_{it} + u_{it} \quad (18)$$

Data

Data needed to calculate α and β, mean weekly hours worked per employed person and labour income share in GDP, are obtained using the ILO web site.[10] GDP growth rate, GDP per capita (constant 2010 US$), Inflation, life expectancy, imports and exports as a percentage of GDP, and income inequality index GINI are from the world bank data base.[11] Data on average number of years of education by those aged 25 years and above are from the UN Human Development

---

[10]https://www.ilo.org/ilostat/faces/ilostat-home/download?_adf.ctrl-state=5q4gd8k59_9&_afrLoop=728417708190961&_afrWindowMode=0&_afrWindowId=5q4gd8k59_6#!%40%40%3F_afrWindowId%3D5q4gd8k59_6%26_afrLoop%3D728417708190961%26_afrWindowMode%3D0%26_adf.ctrl-state%3D474lefyy6_9

[11] https://databank.worldbank.org/source/world-development-indicators

Report.[12] Data on the Cantril Ladder about happiness is from Our world in data.[13] Summary statistics of the variables are given in Table 1.

Variable	Observations	Mean	Std deviation	Minimum	Maximum
α	1093	0.3777	0 .0657	0.2618	0.6927
β	1286	0.5141	0.0961	0.153	0.874
$Schoolyrs$	4985	7.4557	3.18522	0.3	14.1
$Infl$	4709	28.0218	399.6669	-18.1086	23773.13
$XMgdp$	5077	87.3177	55.0757	0.021	860.8
$Gini$	1389	39.1258	9.3735	23.7	65.8
$GDPpc$	5531	12886.41	18352.24	164.3366	141200.4
$Happiness$	1683	5.4434	1.1225	2.6617	8.0189
$GDPgr$	5258	3.6338	6.4599	-64.0471	149.973

Table 1: Summary statistics

3.2. Empirical Results

Factors affecting Preference for work

Before presenting the panel data regression results, Figure 1 and Figure 2 plots the preference for work captured by α against $GDPpc$ and β respectively, using all the available data across countries and years. This gives an indication of the straightforward correlative relationship. Figure 1 indicates that richer countries have lower preference to work. Figure 2 shows a strong negative relationship between labour income share of GDP and attitude to work. As we mentioned earlier, GDP and consumption levels do not directly affect working time in our simple general equilibrium model. However, these factors are correlated with β. In rich countries, capital is more abundant and labour is relatively scarce. So the production function becomes more sensitive to labour contribution than to capital. Consequently labour obtains a higher share of GDP. It seems that it is this structural difference rather than the absolute level of GDP and consumption that makes working time shorter in rich countries. Shorter time is partially due to different utility functions, instead of income levels.

---

[12] http://hdr.undp.org/en/data
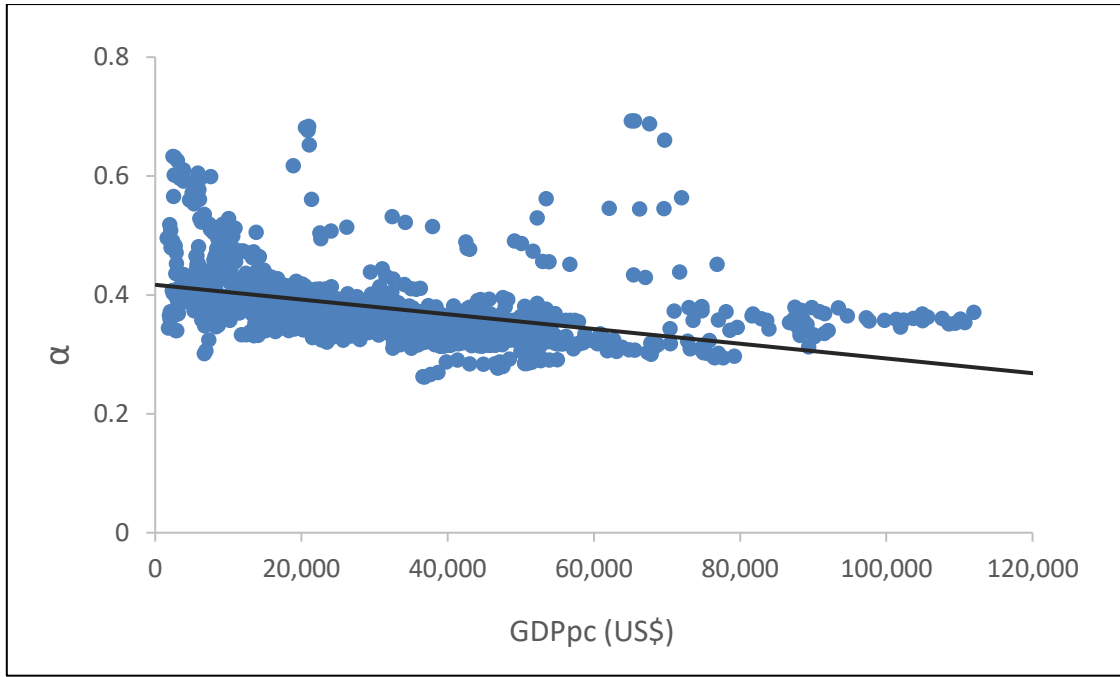[13] https://ourworldindata.org/happiness-and-life-satisfaction
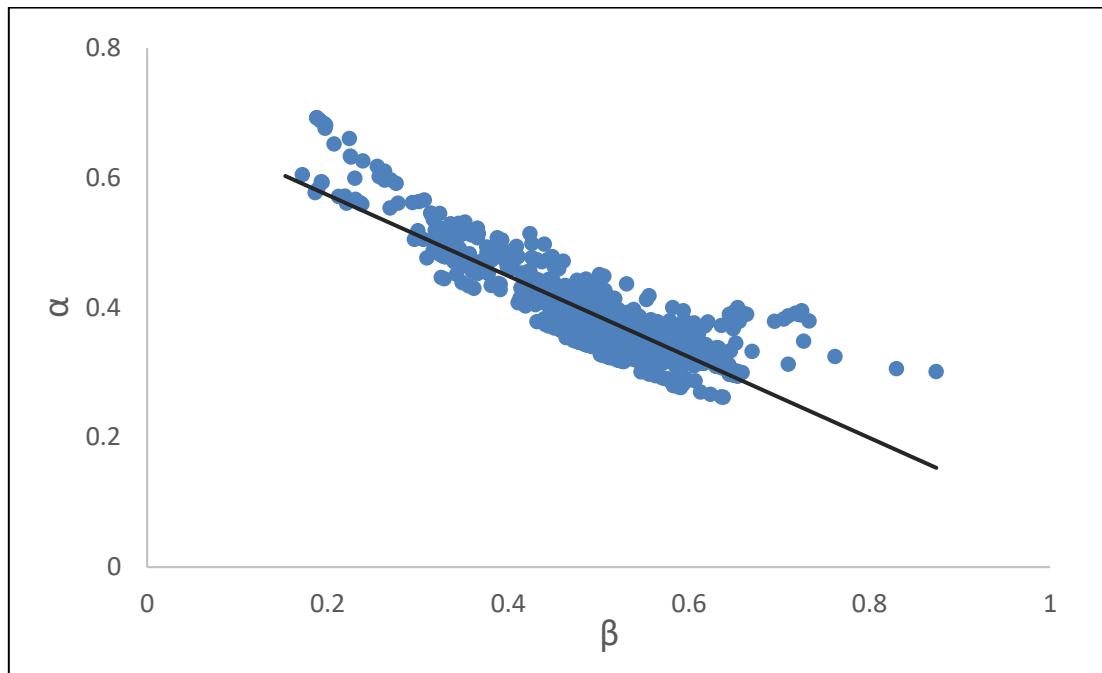
Figure 1: $GDPpc$ and α

Figure 2: β and α

A better understanding of the statistically significant explanatory variables and the direction of effect can be formed from the results of the panel data regression analysis given by (16). The regression included country fixed effects, while standard errors are clustered by countries so that any country specific effects are automatically taken care of. The results of regression (16) about the factors affecting preference to work, α, are presented in Table 2 where robust

13

standard errors are within parenthesis and superscripts **, and *** indicate 5 and 1 percent significance level respectively.

	$Ln\alpha$
$LnGDPpc$	-0.3052^{**} (0.0172)
$Ln\beta$	-0.6197^{***} (0.4534)
$Year$	-0.0019^{***} (0.0004)
Observations	1092
Groups	69
ρ	0.9151

Table 2: Factors affecting α

We find that GDP per capita has a negative effect on α at the 5 percent level of significance. This result vindicates that people in richer countries attach more value to leisure in addition to the impact of β. This result differs from the conventional wisdom that higher real wages reduce work time due to income effects, given fixed preference to work. The share of labour income in GDP, β, has a statistically significant negative effect on α at the 1 percent level. This indicates that as the economy becomes more sensitive to labour contribution, consumption becomes less important relative to leisure. When real wages increase (i.e. higher cost of leisure), instead of being incentivised to work more, they are reducing work because they prefer leisure more. This is different from the usual income effect overriding the substitution effect. Notice from equations (12) and (15) in the theoretical model that both β and α have positive relations with labour. If preference remains fixed, higher β in rich countries would imply longer working hours. Only with a lower α at the same time, can the opposite phenomenon be explained. Our empirical data show a combined impact from both factors, higher β and lower α in rich countries, resulting in a negative overall effect on working time. Another important finding is that as the years go by, the preference for work is going down at a statistical significance level of one percent.

Effect of α on Economic Growth and Happiness

We begin the analysis by presenting Figure 3 and Figure 4 to describe how the preference for work indicator, α, relates to $GDPgr$ and $Happiness$ respectively. Unsurprisingly, the trends show that α has a positive relationship with GDP growth but has a negative relationship with the level of happiness.
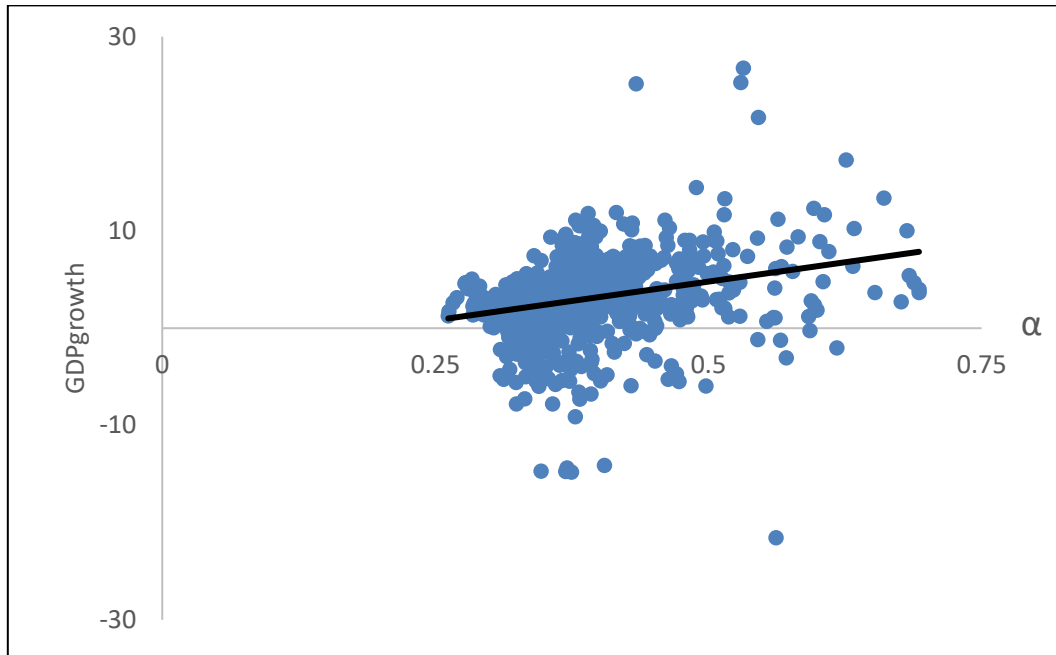

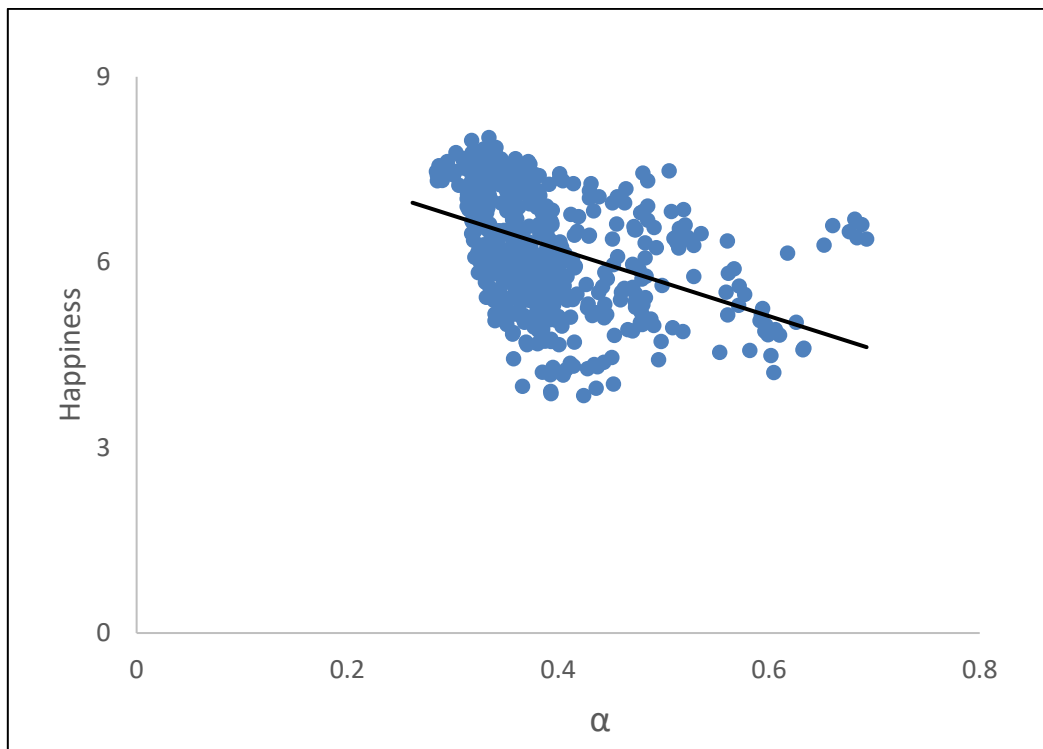Figure 3: α and $GDP\ growth$

Figure 4: α and $Happiness$

Finally, we present the results of the panel data regressions (17) and (18) in Table 3 which analyse the effect of α on GDP growth rate and Happiness. In addition to the country fixed effects, we have controlled for peculiar shocks to the economy or happiness levels by including year fixed effects. The results show that α has a positive effect on $GDPgr$ at the 5 percent level of significance but has a negative effect on $Happiness$ at the 1 percent significance level.

	$GDPgr$	$Happiness$
α	23.0972** (9.6180)	−3.9301*** (1.2687)
$Schoolyrs$	0 .4653** (0 .2334)	−0.0089 (0.0679)
$Infl$	−0.0013 (0 .0140)	−0.0094** (0 .0044)
$XMgdp$	0.0102 (0.0094)	
$Gini$		−0.0381** (0.0186)
$LnGDPpc$	−18.0248** (10.1017)	2.2482*** (0.3929)
$LnGDPpc^2$	1.0978** (0.5522)	
$Year$		−0.0508*** (0. .0109)
$Country\ fixed$	Yes	Yes
$Year\ fixed$	Yes	Yes
Observations	960	334
Groups	60	50
ρ	0.7547	0.9873

Table 3: Effect of α on Economic growth and Happiness

The results of the control variables are as expected. $Schoolyrs$ has a positive effect on GDP growth at a 5 percent significance level and the $GDPpc$ has a quadratic effect which is statistically significant. As the percentage of $GDPpc$ increases, $GDPgr$ reduces at an increasing

rate so that after a point, it will have a positive effect. Turning to happiness, the analysis shows that $GDPpc$ is found to have a statistically significant positive effect while inflation and Gini coefficient of income inequality have a statistically significant negative effect on $Happiness$. We also included a year trend and find that $Happiness$ reduces over time at a statistical significant level of one percent. This could be because people have set a higher threshold for life satisfaction and happiness.

4. Conclusion

In this paper we use a general equilibrium model to suggest a method to estimate preference for consumption relative to leisure, *preference to work*. Using the estimated values, we find some evidence that the preference may differ among countries and times, and the average working hours might be explained partially by this difference. This has not been explicitly examined in the literature, which usually assume preferences are exogenously given and are independent of national or cultural characteristic.

We find empirical evidence that preference to work has decreased over time; is positively affected by higher levels of labour income but negatively affected by GDP per capita. Moreover, we find that differences in preference for work insert visible influence on economic growth, and happiness. If this result can be further established, we should pay more attention to its implication on economy and our social life. In particular, this will affect the impact of taxation on incentives to work, and the long-term economic consequences. It also raises questions about the overall agenda of economic policy, the trade-off between efficiency and equality. After many decades of GDP focused economic policies, we may need to consider different alternatives to meet people's needs when their main preferences shift along social and economic development.

There are some limitations to this research, which can be addressed as this strand of research develops. The data we used to estimate α and β did not include many low-income countries for the results to be more robust. Data did not go back far enough for the analysis to throw more light on possible changes to preference to work.

There are several ways in which this paper can inspire future research. The theoretical model is a good start to this research agenda. There is the possibility of developing other theoretical models to explain people's attitude to work in richer frameworks. Although certain rich countries, e.g. France, have shorter working hours, there is also high unemployment, thus it is unclear whether it is a choice made through optimal labour supply. Moreover, almost in every

country, rich people are working more than the poor. This could be due to different levels of job satisfactions which can also be associated with other factors such as their education and training. We may consider incorporating a model with backward bending labour supply curve. This framework and estimated values for preference to work can be used to investigate how the labour market has responded to shocks such as COVID-19 and whether different attitude to work in countries had any influence in the economic recovery.

Reference

Acemoglu, D., & Johnson, S. (2007). Disease and development: the effect of life expectancy and economic growth. *Journal of Political Economy*, 115(6), 925 - 985. https://doi.org/10.1086/529000

Affaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and Economic Growth: the role of local financial markets. *Journal of International Economics*, 64(1), 89 – 112. https://doi.org/10.1016/S0022-1996(03)00081-3

Ashraf, Q., & Galor, O. (2013). The 'Out of Africa' Hypothesis, Human Genetic Diversity, and Comparative Economic Development. *American Economic Review*, 103, 1 – 46. https://doi.org/10.1257/aer.103.1.1

Alesina, A., & Rodrik, D. (1994). Distributive politics and economic growth. *Quarterly Journal of Economics*, 109, 465 – 490. https://doi.org/10.2307/2118470

Barro, R, (1997). Determinants of economic growth: a cross-country empirical study. NBER No 5698. https://doi.org/10.3386/w5698

Barro, R. (2000). Inequalities and growth in a panel of countries. *Journal of Economic Growth* 5, 5 – 32. https://doi.org/10.1023/A:1009850119329

Basu, S., & Weil, D. N. (1998). Appropriate technology and growth, *Quarterly Journal of Economics*, 113, 1025 – 1054. Retrieved on August 26, 2020, from http://www.jstor.org/stable/2586973

Bellemare, C., & Shearer, B. (2009). Gift giving and worker productivity: evidence from a firm-level experiment. *Games and Economic Behaviour*, 67, 233 – 244. https://doi.org/10.1016/j.geb.2008.12.001

Bick, A., Fuchs-Schündeln, N., & Lagakos, D. (2018). How do hours worked Vary with income? Cross-country evidence and implications. *American Economic Review*, 108, 170 - 99. https://doi.org/10.1257/aer.20151720

Bick, A, Fuchs-Schündeln, N., Lagakos, D., & Tsujiyama, H. (2019). Why are Average Hours Worked Lower in Richer Countries? *NBER Working Paper No. w26554*. https://doi.org/10.3386/w26554

Bils, M., & Klenow, P. (2000). Does schooling cause growth or the other way around? *American Economic Review*, 90, 1160 – 1183. https://doi.org/10.3386/w6393

Booth, A. L., & Frank, F. (1999). Earnings, productivity and performance-related pay. *Journal of Labour Economics*, 17 (3), 447 – 463. https://doi.org/10.1086/209927

Carrol. C., Overland, J., & Weil, D. N. (1997). Saving and growth with habit formation. *American Economic Review,* 90, 341 – 355. https://doi.org/10.1257/aer.90.3.341

Cennamo, L. & Gardner, D. (2008). Generational differences in work values, outcomes and person-organisation values fit. *Journal of Managerial Psychology*, 23 (8), 891-906. https://doi.org/10.1108/02683940810904385

Chen, W., Mrkaic, M. & Nabar, M. (2019). The Global Economic Recovery 10 Years After the 2008 Financial Crisis. *IMF Working Paper Research Department*, WP/19/83. file:///C:/Users/gs169r/Downloads/WPIEA2019083.pdf

Coleman, J. (2015). Greek bailout talks: are stereotypes of lazy Greeks true? *BBC News*, 10th March, 2015. https://www.bbc.co.uk/news/world-europe-31803814

Davis, J. B. Pawlowski, S. D., & Houston, A. (2006). Work commitments of Baby Boomers and Gen-Xers in the IT profession: generational differences or myth? *Journal of Computer Information Systems*, 46, 43-49. Available at, https://doi.org/10.1080/08874417.2006.11645897

Elvira, M., & Town, R. (2002). The effects of race and worker productivity on performance evaluations. *Industrial Relations A Journal of Economy and Society*, 40 (4), 571 – 590. https://doi.org/10.1111/0019-8676.00226

Forbes, K (2000). A reassessment of the relationship between inequality and growth. *American Economic Review*, 90 (4), 869 – 887. https://doi.org/10.1257/aer.90.4.869

Frankel, J., & Romer, D. (1999). Does trade cause growth? *American Economic Review*, 89, 379 – 399. https://doi.org/10.1257/aer.89.3.379

Galor, O., Weil, D. N. (1996). The gender gap, fertility and growth. *American Economic Review*, 86, 374 – 387. https://doi.org/10.3386/w4550

Gelman A. (2013). Ethics and statistics: they'd rather be rigorous than right. *Chance*, 26, 45–49. https://doi.org/10.1080/09332480.2013.794616

Guedes J d'A, Bestor TC, Carrasco D, Flad R, Fosse E, Herzfeld M., Lamberg-Karlovsky, C.C., Lewis, C. M., Liebmann, M., Meadow, R., Patterson, N., Price, M., Reiches, M., Richardson, S., Shattuck-Heidorn, H., Ur, J., Urton, G., & Warrinner, C. (2013). Is Poverty in Our Genes? A Critique of Ashraf and Galor (2013). *Current Anthropology*, 54(1), 71–79. https://doi.org/10.1086/669034

Gursoy, D., Geng, C., Qing, V., & Karadag, E. K. (2013). Generational differences in work values and attitudes among frontline and *service contact employees. International Journal of Hospitality Management*, 32(1):40-48. https://doi.org/10.1016/j.ijhm.2012.04.002

Hall, R., & Jones, C. (1999). Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics*, 114, 83 – 116. https://doi.org/10.3386/w6564

Hamada, K., & Kurosaka, Y. (1986). Trends in unemployment, wages and productivity: the case of Japan. *Economica*, 53, 275 – 296. https://doi.org/10.2307/2554382

Hanushek, E. A., & Kimko, D. D. (2000). Schooling, labour force quality and the growth of nations. *American Economic Review*, 90, 1184 – 1208. https://doi.org/10.1257/aer.90.5.1184

Haslett. B. B. & Leidel, K. (2015). Work Values in a Changing Global Environment: Comparing Chinese and U.S. Students. Intercultural Communication Studies XXIV(2), 11 – 34. https://web.uri.edu/iaics/files/02-Haslett-Leidel.pdf

Heckman, J. J (1993). What has been learned about labour supply in the past twenty years? *The American Economic Review*, 83 (2), 116 – 121. Retrieved on August 26th, 2020, from http://www.jstor.org/stable/2117650

Hellerstein, J. K., Neuman, D., & Troske, K. R (1999). Wages, productivity and worker characteristics: evidence from plant-level production functions and wage equations. *Journal of Labor Economics*, 17(3), 409-446. https://doi.org/10.1086/209926

Holzer, H. J. (2008). The determinants of employee productivity and earnings. *Industrial Relations: A Journal of Economy and Society*, 29 (3), 403 – 422. https://doi.org/10.1111/j.1468-232X.1990.tb00761.x

Hruby, D. (2018). Young Chinese are sick of working long hours. *BBC News*, 8th May 2018. https://www.bbc.com/worklife/article/20180508-young-chinese-are-sick-of-working-overtime

Jones, C (1995). R & D – based models of economic growth. *Journal of Political Economy,* 103, 759 – 784. https://doi.org/10.1086/262002

Klette, T. J. (1999). Emerald Book chapter: "Do higher wages reflect higher productivity? Education, gender and experience premiums in a matched plant – worker data set. *Discussion Papers 208, Statistics Norway, Research Department*. Available at https://ideas.repec.org/p/ssb/dispap/208.html

Kopytov, A., Roussanov, N., & Taschereau-Dumouchel, M. (2020). Cheap thrills: the price of leisure and the global decline in working hours. *NBER Working Paper No. 27744*. https://doi.org/10.3386/w27744

Lancaster, L. C., & Stillman, D. (2002). When Generations Collide: Who They Are. Why They Clash. How to Solve the Generational Puzzle at Work. *The Quality Management Journal*, Harper Collins, New York, NY. Available at https://search.proquest.com/openview/ee94a3087929a389f1ee1c3def9c7a04/1?pq-origsite=gscholar&cbl=31933

Leviaux, P., & Parent, A. (2018). The biological hypothesis in cliometrics of growth: a methodological critique of Fogel (post 1982) and Ashraf & Galor (2013). *Journal of Evolutionary Economics*, 28, 929–950. https://doi.org/10.1007/s00191-018-0560-x

Levine, R (1999). Law, finance and economic growth. Journal of Financial Intermediation, 8, 8 – 35. https://doi.org/10.1016/j.jfineco.2004.06.010

Li, J. & Madsen, J. (2009). Chinese workers' work ethic in reformed state-owned enterprises: implications for HRD, *Human Resource Development International*, 12(2), 171-188. https://doi.org/10.1080/13678860902764100

Mauro, P (1995). Corruption and growth. *The Quarterly Journal of Economics*, 110(3), 681 – 712. https://doi.org/10.2307/2946696

Meriac, J. P., Woehr, D. J., & Banister, C. (2010). Generational differences in work ethic: An examination of measurement equivalence across three cohorts. *Journal of Business and Psychology*, 25, 315–324. https://doi.org/10.1007/s10869-010-9164-7

Öztürk, S. (2015). Effects of Global Financial Crisis on Greek Economy: Causes of Present Economic and Political Loss. *International Journal of Managerial Studies and Research*, 3(6), 26-35. www.arcjournals.org

Öztürk, S. & Sozdemir, A. (2015). Effects of global financial crisis on Greece economy. Procedia Economics and Finance, 23, 568 – 575. https://doi.org/10.1016/S2212-5671(15)00441-4

Persson, T., & Tabellini, G. (1994). Is inequality harmful for growth? Theory and evidence. *American Economic Review*, 84, 600 – 621. https://doi.org/10.3386/w3599

Pop, V. (2011). Merkel under fire for 'lazy Greeks' comment. *euobserver* 19th May, 2011. https://euobserver.com/political/32363

Rice, P., Venables, A. J., & Patacchini, E. (2006). Spatial determinants of productivity: analysis for the regions of Great Britain. *Regional Science and Urban Economics*, 36 (6), 727 – 752. https://doi.org/10.1016/j.regsciurbeco.2006.03.006

Smola, K. W., & Sutton, C. D. (2002). Generational differences: revisiting generational work values for the new millennium. *Journal of Organizational Behavior*, 23 (4), 363-382. https://doi.org/10.1002/job.147

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics*, 70(1), 65–94. https://doi.org/10.2307/1884513

Stam, K., Verbakel, E., & De Graaf, P. M. (2013) Explaining variation in work ethic in Europe. *European Societies,* 15(2), 268-289. https://doi.org/10.1080/14616696.2012.726734

Strauss, J., Thomas, D. (1998). Health, nutrition and economic development. *Journal of Economic Literature*, 36, 766 – 817. Retrieved August 26, 2020, from http://www.jstor.org/stable/2565122

Temple, J., & Johnson, P. A. (1998). Social capability and economic growth. *Quarterly Journal of Economics*, 113, 965 – 990. https://doi.org/10.1162/003355398555711

Thompson, D. (2012). Europe Agrees: Greece Is the Laziest, Most Incompetent Nation in the EU. *The Atlantic*, 29th May, 2012. https://www.theatlantic.com/business/archive/2012/05/europe-agrees-greece-is-the-laziest-most-incompetent-nation-in-the-eu/257764/

Twenge, J.M., Campbell, S. M., Hoffman, B. J. & Lance, C, E. (2010). Generational differences in work values: leisure and extrinsic values increasing, social and intrinsic values decreasing. *Journal of Management (NY)*, 36 (5). https://doi.org/10.1177/0149206309352246

Wacziarg, R., & Welch, K. H. (2008). Trade liberalization and growth: new evidence. *The World Bank Economic Review,* 22(2), 187–231. https://doi.org/10.1093/wber/lhn007

Wallace, J. E. (2006). Work commitment in the legal profession: a study of Baby Boomers and Generation Xers. *International Journal of the Legal Profession*, 13(2), 137-151.

https://doi.org/10.1080/09695950600961293

Weber, M. (1905). The Protestant Ethic and the Spirit of Capitalism. *Oxford University Press*.

Yglesias, M. (2011). Are Greeks lazy? Europe is a mess because Germans work hard and Greeks are shiftless. False! *SLATE* 19th December, 2011. https://slate.com/business/2011/12/european-financial-crisis-is-europe-a-mess-because-germans-work-hard-and-greeks-are-lazy.html

https://www.bbc.com/worklife/article/20190809-deskterior-the-ornately-decorated-desks-of-south-korea

https://www.careeraddict.com/5-work-habits-worth-learning-from-the-germans

https://databank.worldbank.org/source/world-development-indicators

https://www.dw.com/en/study-finds-that-germans-work-more-than-most-europeans/a-4529694

https://edition.cnn.com/2018/11/04/asia/korea-working-hours-intl/index.html

http://hdr.undp.org/en/data

https://www.ilo.org/ilostat/faces/ilostat-home/download?_adf.ctrl-state=5q4gd8k59_9&_afrLoop=728417708190961&_afrWindowMode=0&_afrWindowId=5q4gd8k59_6#!%40%40%3F_afrWindowId%3D5q4gd8k59_6%26_afrLoop%3D72841770819 0961%26_afrWindowMode%3D0%26_adf.ctrl-state%3D474lefyy6_9

https://ourworldindata.org/happiness-and-life-satisfaction

https://www.welcometothejungle.com/en/articles/german-work-culture