

**VALUING ECOLOGICAL SERVICES IN  
A MODERN TECHNOLOGICAL ECONOMY**  
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**ABSTRACT**

This paper describes how economic value may be derived from the inversion of the time-energy cost of goods (or services) produced with an energy equivalent currency of kilowatt-hours, watt-hours and watt-seconds, as suggested by Buckminster Fuller. Ranil Senanayake has stressed the urgent need to evaluate the ecological services provided by photosynthetic biomass and suggests that monitoring the Air Quality Index (US) AQI would prioritize the extant photosynthetic biomass in a production unit. Time-energy accounting for work done will make each economic transaction net of energy footprint and can provide the value for ecological services without a need to capitalize the underlying resources. The Cost of Breathing (COB) of each economic unit will establish the per capita costs necessary to survive for a single day in the Economy. True Parity Purchasing Value (PPV) will apportion relative costs. The Energy Delivered Value (EDV) of each community will be an index that prorates the cost of delivering goods and services across the communities from the amount and source of energy consumed. The quantity and quality of the labour involved maybe calculated as a premium (L) over the base time-energy cost. An energy equivalency currency (ECO) would invert these values to apportion the costs in a time-energy accounting (V) for work done and goods and services produced. The less energy consumed the more inherent value in the good or service produced. An economic system that requires more and more people to do less and less work misuses technology to create and maintain poverty. Clifford H. Douglas suggested an Office of Social Credit that provides a basic stipend to society to distribute the production of industry. Internet-based Distributed Ledger technology can link networks of like-minded communities who tally transactions and collate economic activity seamlessly; building common wealth through consensus, cooperation and mutual debt. This paper then situates this technology in the direct democratic process of our forefathers and the great or common consensus, that if man lives in dhamma, the land, its people, flora and fauna will be safe.

Keywords: Blockchain, Crypto-currency, Direct Democracy, Photosynthetic Biomass, Time-Energy Accounting, Mahasammatta, Social Credit

### **THE MODERN TECHNOLOGICAL ECONOMY**

The inefficiency of the modern economy lies in its inability to distribute its production to willing consumers. This inability arises from an abstraction of the value of a thing from its simple utility.

Cause and effect have been perverted to a system of rewards and punishments and burgeoning unemployment is seen as a symptom of the breakdown of industrial society, rather than as a sign of scientific, technological and economic progress.

Compounded on this are the ecological costs of the wasteful nature of relentless growth and the fact that these practises have endangered life itself.

In the natural world of cause and effect, the value of something is assessed as that quality which makes a given object serviceable in the attainment of a given end. In other words, it is the utility of the thing that is naturally of value.

Borrowing from nature, "The proper function of a money system is to furnish the information necessary to direct the production and distribution of goods and services. It is, or should be, an "order" system not a "reward" system. It is essentially a mechanism of administration, subservient to policy and it is because it is superior to all other mechanisms of administration that the money control of the world is so immensely important."<sup>1</sup>

Many scholars<sup>2</sup> have examined the polarisations of global finance, its reach, agglomeration and club<sup>3</sup>-like nature. As it is, 17 interlocked groups of capital have been identified<sup>4</sup> with links to governments, defense industries, private military contractors, global media conglomerates, and powerful think-tanks that formulate policy and ensure implementation.

"Just so long as a rigid abstraction is made the test to which physical facts must conform (and any theory of money that pretends to measure value comes under this description), just so long must there be friction and abrasion between the theory and the facts."<sup>5</sup>

It is clear then that the gap between Demand and Supply has little to do with the ability of the production and industrial system to answer the calls of need, but all to do with the organisation which stands between them, the abstracted financial system.

If A represents all payments made to individuals (wages, salaries and dividends) in the production of a good or service and B represents all payments made to other organisations (raw material, bank charges and other external costs), then  $A+B=C$ <sup>6</sup> where C is the selling price of the product. Since all income is accounted for in A no individual can purchase what they produce in a single production cycle. This means that the method for evaluating the cost of making an economic good is flawed as total incomes are necessarily less than total prices generated in the same period of time by all industries<sup>7</sup>.

It is vital that the financial ticket system allows us to pay these costs without mortgaging the future.

### **THE SATANIC FORMULA**

The Satanic formula is derived from the generalized formula for extracting energy from fossil fuel,  $CH_4 + O_2 \rightarrow CO_2 + H_2O + e$ . When looked at in terms of its combustion products we arrive at  $fCH_4 + bO_2 \rightarrow nCO_2 + nH_2O + e$ . This states that burning fossil Hydrogen and fossil Carbon (oil, gas, coal) using biologically created Oxygen creates 'new' Carbon Dioxide and 'new' water vapour that never existed in the atmosphere before. "The expansion of fossil fuel industry and farming at the expense of the forests and the seas, not only destabilizes the atmosphere and accelerates global warming but it also removes the very basis for the expression of life by burning the biologically created Oxygen without paying for its replacement."<sup>8</sup>

### **TIME ENERGY ACCOUNTING FOR WORK DONE**

Production is the conversion of matter or energy from an unavailable form to one in which it may be of use and benefit to mankind. Accordingly, the efficiency of this conversion depends primarily on the usefulness of the end product. But usefulness to whom, and who is to be the judge of it?

The metabolic nature of life requires that we consume energy and convert it in order to survive. We once spent a greater part of our time and energy ensuring this but due to increased automation and the industrial method it is increasingly less necessary.

The most critical and valuable material in maintaining the life support system of the planet is its photosynthetic biomass<sup>9</sup>.

No value can be created without a transaction between two or more human beings. Assigning value is how we account for work done.

Buckminster Fuller<sup>10</sup> suggested time-energy accounting of work done in kilowatt-hours, watt-hours and watt-seconds of work.

Such a system would allocate value in the economy according to type, quality and quantity of the energy used to produce the goods and services society needs.

Taking the inverse of the energy cost as the base value of the good produced will prioritize value according to the least time taken to produce it. This would include not only the man-hours but also the time nature has taken to produce the energy that man has taken to convert for use.

The Cost of Breathing (CoB) would add all the monetary (in the transitional period) and energy costs necessary to survive in a 24-hour period in a particular community. This value maybe represented as eCOB.

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An Energy Delivered Index (EDX) would calculate the cost in energy and formal currency to deliver the energy used to produce a particular good or service, and establish a total Energy Delivered Value (EDV), which maybe arrived at by multiplying the time (t) taken to extract, convert and deliver the amount and type of energy (e) to the end user such that:

$$EDV = (e_1 * t_1 + e_2 * t_2 + e_3 * t_3 \dots + e_n * t_n) = \sum_i^n e_i t_i$$

Incorporating the location of production, would prioritise the extant photosynthetic biomass in an economic production unit. This figure (AQI) maybe estimated by measuring the Air Quality of the location as per the US EPA AQI index scale.

Parity Purchasing Value will establish a comparative index based on EDV, EDX, CoB and generate a time and energy base value system.

The quantity and quality of the labour involved maybe calculated as a premium (L) over the base time-energy cost.

An energy equivalency currency (ECO) would invert these values to apportion the costs in a time-energy accounting (V) for work done and goods and services produced:

$$ECO (V) = \{1 / (eCOB/AQI) + (EDV)\} . L \Rightarrow \frac{L}{eCOB . AQI . EDV}$$

An example will illustrate how this true value of each transaction could be assigned. If one takes a street of bakers all making bread of comparable taste and quality:

Baker A uses electricity from the national grid, B uses an lp-gas oven, C uses a wood burning oven, and D uses solar power with batteries to operate the same brand and type of electric oven as A.

Assuming a standard selling price for a loaf of *kadé* bread and equivalency of labour in a standard manufacturing method, inverting the energy cost of manufacture of each Baker will automatically reward the bakery using the least costly energy.

Each party within the system will have an inherent energy footprint and any economic good or service produced by this entity will have a relative value with the other contracting party.

If one evaluates the energy that goes in to giving me a glass of cool water from my LG fridge, one must begin the calculation in Korea and add all the proportional energy required to bring it to my home, where it is plugged in to the national grid and cools my water.

Contrast this to a farmer in the Wannu who has a clay water pot in a shady part of his home, where it transpires and cools.

In an economy where value is predicated on the inverse of the energy cost, the goods and services produced by the farmer would be inherently and proportionately more valuable

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than mine. Accordingly, local industry, production or manufacture will be automatically advantaged over the external and economic activity stratified over all aspects of production.

Society is a machine to produce the goods and services it needs. The more efficiently such a machine functions the more useful it is.

**MAHASAMMATTA**

In Sri Lanka colonialism destroyed the way the country was organized. Before, there was a great independency for the peasantry, individual ownership of land was unthinkable and each person owed a portion of the productive capacity of the land he tilled to the community. A craftsman also received his share according to his contribution. *Pangukramaya*, each according to his share according to his contribution.

The *puranagama* civilisation of the peasantry of Lanka was a tank-based agricultural society maintained by the Cascade System. Each person in the community had a role to play in the maintenance of the infrastructure and social cohesion of the village. This was called *rajakariya*: nominally service to the King but in practice service to the community. The village was administered through an ad hoc Council of Elders.

When the British left they took themselves away but left the Westminster system of rule by elite. Where once our Kings ruled by consensus, *Mahasammatta* (if one lives in dhamma the land and the people will be safe), today our rulers rule by force of power.

Natural resources are the common property of all and the means of their exploitation should also be common. This does not mean they should be appropriated by the government but that they should be enjoyed in common by all. The air we breathe is such a resource, common property in the most complete sense, it is available everywhere and all have the means of its exploitation. If, as is happening today with water, the air was vested in the government or private capital then everyone would lose the right to breathe unless they had the requisite license or financial ticket.

The ecological services provided by natural systems of the planet have no direct way of being valued in the current economy. Instead we have to resort to indirect reparations such as carbon taxes that seek to ameliorate pollution not prevent it and necessitate capitalisation of those resources through an abstraction of their value. Most of the time polluters leave the clean up to society.

In an economy predicated on energy a country such as ours with its abundance of biodiversity is automatically compensated for the services it provides.

I think it is clear that to assign value to ecological services using an abstracted value system is an endeavour fraught with error and inherent bias and will privatise what is and should always be held in common by all.

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You never change things by fighting the existing reality. You must invent a new reality that makes the old obsolete. For that reason, we can only make sustainable change in Sri Lanka and retain what is left of our traditions and culture by restoring our independent, self-sufficient villages.

F. Mansoor  
Puwakwatte  
Kotadeniyawa  
October 18, 2018.

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- <sup>1</sup> [Douglas, C. H. (1933), *Social Credit* 3<sup>rd</sup> ed., Eyre & Spottiswoode, London] Pg. 62  
<sup>2</sup> [Robinson, W.I. (2014), *Global Capitalism and the Crisis of Humanity*, Cambridge University Press, New York]  
<sup>3</sup> [Eleni Tsingou (2015) [Club governance and the making of global financial rules](#), Review of International Political Economy, 22:2, 225-256, DOI: [10.1080/09692290.2014.890952](#)]  
<sup>4</sup> [Phillips, P.M, (2018), *Giants: The Global Power Elite*, Seven Stories Press, New York]  
<sup>5</sup> [Douglas, C.H., *ibid*], Pg 64  
<sup>6</sup> [Douglas, C. H., (1921), *Credit Power & Democracy* 2<sup>nd</sup> ed., C. Palmer, London]  
<sup>7</sup> [Schroeder, J., (2014), [A+B: A Mathematic Reply to an Objection](#), Clifford Hugh Douglas Institute, Online resource]  
<sup>8</sup> [Senanayake, F. R., (2017), [The Satanic Formula](#), Daily Mirror newspaper, Colombo]  
<sup>9</sup> [Senanayake, F. R. (2011), *Realising the value of Photosynthetic Biomass*, Proceedings of the 5<sup>th</sup> Congress on Forestry, Havana,,April 27, 2011]  
<sup>10</sup> [Fuller, R. B., (1981), *Critical Path*, St Martin's Press, New York]

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## APPENDIX 1

### THE TRANSNATIONAL CAPITALIST CLASS

In January, 2018 Oxfam International published a study (Reward Work, not Wealth)<sup>11</sup> that found that in 2017, 82 percent of global wealth went to 1 percent of the population. 3.7 billion of the world saw no increase in their wealth at all.

C Wright Mills' 1956 book, *The Power Elite*<sup>12</sup>, identified three groups of elite who had directive power in the U.S. economy, the Political Elite, the Military Elite and the Business Elite. In the tradition of this seminal work, Professor Peter Phillips of Sonoma State University, in his book, *Giants: The Global Power Elite*<sup>13</sup>, finds that what was once a national capitalist class has developed through transnational integration of their capital in to a transnational capitalist class of 389 individuals who stand at the very apex of the global power structure. Phillips identifies "... 17 global financial conglomerates who collectively manage some \$41.1 trillion in a self-invested network of interlocking capital that spans the globe."<sup>14</sup>

University of California, Santa Barbara, sociologist, Professor William I Robinson in his 2014 book, *Global Capitalism and the Crisis of Humanity*<sup>15</sup> says that the world faces an unprecedented crisis of social inequality, environmental degradation, global violence and economic destabilization. He describes a centralized world in which an over-accumulation of financial capital has just three mechanisms for investing this excess: risky financial speculation, wars and preparations for war, and the privatization of public institutions. Professor Robinson identifies four unique aspects of 21<sup>st</sup> Century Capitalism that contribute to this crisis:

- "First is the rise of truly transnational capital and a new global production and financial system into which all nations and much of humanity have been integrated, either directly or indirectly...
- "Second is the rise of a Transnational Capitalist Class (TCC), a class group that has drawn in contingents from most countries around the world, North and South, and has attempted to position itself as a global ruling class. This TCC is the hegemonic fraction of capital on a world scale...
- "Third is the rise of Transnational State (TNS) apparatuses. The TNS is constituted as a loose network made up of trans- and supra- national organizations together with national states that functions to organize the conditions for transnational accumulation and through which the TCC attempts to organize and institutionally exercise its class power...
- "Fourth are novel relations of inequality, domination, and exploitation in global society, including an increasing importance of transnational social and class inequalities relative to North- South inequalities that are geographically or territorially conceived."<sup>16</sup>

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**GIANTS: TOP ASSET MANAGEMENT FIRMS WITH  
 MORE THAN \$1 TRILLION IN EARLY 2017**

<b>Name</b>	<b>Country</b>	<b>Assets in Mgmt (in Trillions)</b>	<b>Superconnected Global Rank (2010)</b>
1. BlackRock*	US	\$5.4	—
2. Vanguard Group	US	\$4.4	8
3. JP Morgan Chase	US	\$3.8	6
4. Allianz SE (PIMCO)	Germany/ US	\$3.3	27
5. UBS	Switzerland	\$2.8	9
6. Bank of America Merrill Lynch	US	\$2.5	10
7. Barclays plc	Great Britain	\$2.5	1
8. State Street Global Advisors	US	\$2.4	5
9. Fidelity Invest- ments (FMR)	US	\$2.1	3
10. Bank of New York Mellon	US	\$1.7	16
11. AXA Group	France	\$1.5	4
12. Capital Group	US	\$1.4	2
13. Goldman Sachs Group	US	\$1.4	18
14. Credit Suisse	Switzerland	\$1.3	14
15. Prudential Financial	US	\$1.3	—
16. Morgan Stanley & Co.	US	\$1.3	21
17. Amundi/Crédit Agricole	France	\$1.1	24
<b>TOTAL 17 Firms (199 Directors)</b>		<b>\$41.1</b>	

\*Note: BlackRock acquired Barclay's Global Investors's assets management business in 2009, likely putting them into a current ranking of the most interconnected firms. In 2017 BlackRock increased assets under management by 22 percent to \$6.29 trillion and reported a \$1.2 billion tax benefit in the fourth quarter from Trump's tax cut package.<sup>54</sup>

Professor Peter Phillips identified<sup>17</sup> the top seventeen asset management firms in the world each managing at least \$1 trillion dollars of investment capital. He says,

“These seventeen Giants of capitalism that collectively manage this concentration of

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\$41.1 trillion operate in nearly every country. They are the central institutions of the financial capital that powers the global economic system. Western governments and international policy bodies tend to work in the interests of these financial Giants to protect the free flow of capital investment and ensure debt collection everywhere in the world.

In 2011, a study entitled *The Network of Global Corporate Control*, by Stefania Vitalia, James B. Glattfelder and Stefano Battiston of the Swiss Federal Institute of Technology, using mathematical models that usually map natural systems, found that 147 companies in Europe controlled some 40 percent of the world's wealth.<sup>18</sup>

Building on this study Professor Phillips finds that: "Fifteen of the top seventeen asset management firms were among the top 27 most centralized firms identified in the Swiss study, and nine are among the top ten superconnected firms...", he continues:

"The top asset management firms tend to invest in each other, making this network a solid core of interlinked companies with shared investments worldwide. JPMorgan Chase and fourteen other trillion-dollar Giants are invested directly in BlackRock. The seventeen Giants collectively invest \$403.4 billion in each other. This interlocked capital is likely much higher than estimated here, more in the \$1 trillion -2 trillion range, given that the Giants' NASDAQ data set \$9.8 trillion only gives investment information on about 24 percent of the total \$41.1 trillion. But these estimates are enough to clearly show that the Giants are significantly invested in each other. The result of this cross-investment is an interlocked global capital structure amassing greater and greater wealth to the continuing detriment of billions of people worldwide."<sup>19</sup>

The seventeen global financial agglomerates have 199 directors on their Boards. These 199 individuals represent the financial management core of global capitalism. 136 of these individuals are male. 84 percent are whites of European descent. Altogether they hold 147 graduate degrees, 59 MBAs, 22 JDs, 23 PhDs and 35 Masters degrees. Almost all have attended private elite colleges, with 28 having been to Harvard or Stanford. 117 people are from the U.S, 22 each from the U.K and France, 13 each from Germany and Switzerland, 3 each from Italy, Singapore, India, Austria and Australia, 2 each from Japan and Brazil, and one each from South Africa, the Netherlands, Zambia, Kuwait, Belgium, Canada, Mexico, Qatar and Colombia.<sup>20</sup>

These core group managers take active part in global policy groups and governments. They serve as advisers to the IMF, the WTO, World Bank, Bank for International Settlements, the Federal Reserve Board, G7 and G20. In addition, these 199 also serve on 202 smaller investment management firms and many of these are privately owned. This superclass of managers set the priorities for monetary investments in business, industry and governments. Their priority is a return on investment of not less than 3 percent per annum. Capital that invests in tobacco, war weapons, toxic chemicals, and other socially destructive goods and services creating pollution, famine and preventable epidemics, are

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only interested in this return and bear no responsibility, fiduciary or moral, for this destruction they have fostered.

William I Robinson third necessary component of transnational capital is the transnational state apparatus or TNS. The international institutions highlighted in the previous paragraph serve as mechanisms for the TCC consensus building, policy formulation and implementation to ensure the free flow of capital and debt collection globally. These institutions are controlled by representatives of nations states with proportional power and control exercised by the dominant financial supporters, the US and Europe. However, it is the privately funded think-thanks like the Group of 30 (G30) and the Trilateral Commission, at which global policy is developed. Professor Phillips clarifies,

“The G30 and the Trilateral Commission are privately funded, self-supported research organisations / forums, whereby TCC power elites can speak openly on global capital and security issues, moving toward a consensus of understanding on needed policies and their implementation. These meetings offer TCC power elite individuals opportunities to personally interact with each other face to face in private, off-the-record settings that allow for personal intimacies, trust and friendships to emerge. These interactions are the foundation of TCC class-consciousness and social awareness of common interests... a wide variety of policy issues emerge for implementation by transnational entities, security institutions (military/police and intelligence agencies), and ideological organisations (media and public relations firms).”<sup>21</sup>

Phillips identifies a combined membership of 86 individuals in the G30 and the Trilateral Commission. 12 of the 17 Giants, have representation in these privately funded non-profit corporations, Goldman Sachs has four directors. The G30 founded in 1978, releases reports and findings from studies made by power elite bankers, financiers, policymakers and academics. Its findings are usually accepted and implemented across the globe.

Andrew Gavin Marshall reports in *Global Power Projects: The Group of 30 and its methods of Financial Governance*<sup>22</sup>,

“In 2012, the G30 published a report compiled by the Working Group on Long Term Finance, which was composed of nearly two-thirds of the membership of the G30. The reports set out their concerns about the ‘the efficient provision of a level of long-term finance sufficient to support expected sustainable economic growth in advanced and emerging economies.’ The report noted that it was not an ‘abstract exercise’ but was ‘operational’ complete with ‘practical recommendations for global and national actors and policy makers that would... help create a system of long-term finance. In other words, for the Group of Thirty, they don’t produce mere ‘recommendations’ but rather ‘instructions’ which they expect to be followed. It is of significance that many of those who produce the reports as members of the G30 conveniently hold other official positions so as to be able to dutifully implement those instructions.”

Of the 32 policy directors of the G30, 12 are from the U.S. (one dual Israeli national),

three members from France (one with Ivory Coast nationality too), the two members from the U.K are British peers with seats in the House of Lords, Germany and Mexico also have two members each and there is one director each from Poland, Canada, Spain, Argentina, Italy, Brazil, Switzerland, Japan, India, Singapore and China.

Professor Eleni Tsingou of the Copenhagen Business School says the G30 operates like a club. In a paper titled *Club Governance and the making of Global Financial Rules*, Professor Tsingou writes in her Introduction,

“The G-30 is a ‘club’ in the transnational policy community. Clubs are held together by elite peer recognition, common and mutually reinforcing interests, and an ambition to provide global public goods in line with values its members consider honourable. This notion of a ‘club’ explains how the actors who write the rules for global finance work together. This understanding of a club complements, but is distinct from, work on expert ‘epistemic communities’ and the ‘transnational capitalist class’. The club concept goes beyond transnational communities as bound together by scientific agreement or aligned through ideological affiliation and material interest. Clubs focus our attention on specifying the actors, their motivations and the mechanisms that lead to consensus on specific governance issues and policy options. The club is not an abstract analytical construction; rather, it is a concept developed from the 80þ interviews with stakeholders in the financial policy community over a 12-year period. The interviews lead to an overview of group dynamics that goes beyond an understanding of a ‘club’ as mere moniker for a group who has defined material interests and wishes to capture the process of making financial regulation. The most important form of capture is of an intellectual nature in that it defines what constitutes appropriate governance.”<sup>23</sup>

## **APPENDIX 2**

### **JOBS LOST TO AUTOMATION**

McKinsey Global Institute in their study *Jobs Lost, Jobs Gained*<sup>24</sup> dated December 2017 found that while some new jobs maybe created as a result of innovation overall, “...Our scenarios across 46 countries suggest that between almost zero and one-third of work activities could be displaced by 2030, with a midpoint of 15 percent.” This they say represents at least 400 million workers displaced by automation. While asserting that it will be the most scientifically advanced economies that will be most affected by automation they suggest between 3 to 14 percent of the global workforce will have to be switch occupations and learn new skills to apply new technology.

Meanwhile the International Federation of Robotics in its appraisal of world industrial robotics in 2017<sup>25</sup>, observed that in 2016, robot sales increased by 16 percent. After considerable increase in robot sales to the automotive industry between 2010 and 2014, the IFR finds moderate growth of 6 percent for that industry that contrasts with the 41 percent increase in robot sales to electronics / electrical industries. Automotive robots account for roughly 35 percent of total sales with electronics/electrical sales fast catching up at 31 percent of total supply. The IFR finds that 74 percent of global robot sales are concentrated in five major markets, namely China, the Republic of Korea, Japan, the

United States and Germany. Nevertheless, robotic installations have continued to increase in Taiwan, Italy, Thailand, India, Spain, France, the United Kingdom and other Western European states.

When making a comparison between countries in terms of the distribution of multipurpose industrial robots, the IFR uses a measure of robot density in terms of the number of multipurpose industrial robots per 10'000 people employed in industry. The average global robot density is about 74 industrial robots per 10'000 employees in the manufacturing industries. The industrial robot density in the Republic of Korea is 2145:10000, in the U.S. it is 1261:10000, Japan 1240, France 1150, Germany 1131 and Spain 1051.

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<sup>11</sup> [Oxfam International (2018), Briefing Paper: [Reward Work Not Wealth](#)]

<sup>12</sup> [Mills, C. W. (1956) Wolf A (contributor) (2000), [The Power Elite New Edition](#), New York, Oxford University Press]

<sup>13</sup> [Phillips, P.M, (2018), *Giants: The Global Power Elite*, Seven Stories Press, New York]

<sup>14</sup> [Phillips, P.M., *ibid*]

<sup>15</sup> [Robinson, W.I. (2014), *Global Capitalism and the Crisis of Humanity*, Cambridge University Press, New York]

<sup>16</sup> [Robinson, W. I., *ibid*]

<sup>17</sup> [Phillips, P.M, (2018), *Giants: The Global Power Elite*, Seven Stories Press, New York]

<sup>18</sup> [Vitali, S., Glattfelder, J.B. and Battiston S. (2011), [The Network of Global Corporate Control](#), Swiss Federal Institute of Technology, Zurich]

<sup>19</sup> [Phillips, P.M., *ibid*], Pg 37-39.

<sup>20</sup> [Phillips, P.M., *ibid*], Cap 3

<sup>21</sup> [Phillips, P.M., *ibid*], Pg 162

<sup>22</sup> [Marshall A.G., (2013), [Global Power Projects: The Group of 30 and its methods of Financial Governance](#), online]

<sup>23</sup> [Eleni Tsingou (2015) [Club governance and the making of global financial rules](#), Review of International Political Economy, 22:2, 225-256, DOI: [10.1080/09692290.2014.890952](https://doi.org/10.1080/09692290.2014.890952)]

<sup>24</sup> [McKinsey Global Institute, (2017) [Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation](#)]

<sup>25</sup> [International Federation of Robotics (2018) [World Robotics 2017: Industrial Robots](#)]