The Perfect Market:

A Theoretical Analysis of Deterministic Economics

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Abstract;

The following is a theoretical paper detailing multiple potential advancements to the economic field of game theory. Examples include collective group behavior, mutual evolution and cooperative outcomes. While they are yet to be engendered through a rigorous mathematical description, they nonetheless constitute a set of tenets I believe to be closely associated with the behavioral facets of deterministic economics.

Part 1; Financial Economics

Chapter 1: The Heart of the Human Condition

At the heart of the human condition is irrationality. Human beings perpetually tend to make decisions that are rational in terms of their own lives, but completely irrational in favor of the collective. It is extremely important that the point being raised here is NOT a capitalism vs Marxism debate. No. By no means is this the case. What I mean to say is; people make decisions for short term gains. There are four ideas that are fundamental here.

1) **Economics is NOT a zero-sum game**
2) **There is collective, and in fact incentive-less benefit in accounting for life as a cooperative game**
3) **The Equilibrium Paradox**
4) **Synergy exists in altruistic economic behavior**

In order to collectively explain the consequences of each of these, we will be addressing a set of equations that mathematically rationalize them.

Imagine the following.

A) If someone offered you the choice between being given ten thousand dollars or seeing their state gain an additional 10% in employment numbers over the next 5 years, you would likely take the money. There's a very simple reason for this. The money you receive at the time you make the decision has a clear-cut incentive that you are certain of and prefer. It gives you flexibility in terms of affordability, and allows you to invest/save as you like too.
While making the decision, you may well be aware that the 10% employment in the 5 years to come, should you tread that path, might bring you more revenue (as it certifies absolute economic growth). But of this, you are not certain.

B) Suppose you understand, as well as accept the benefits of taking employment over money. You can then make a decision approaching the rational, economic-driven consensus of picking employment. Unfortunately, this doesn't work. The reason this doesn't work is because nobody is consciously aware of the choice and is educated enough to make it at the same time. One may account for this with imperfect information, but it's nowhere near as simple as that.

The factor of the matter is that individuals, peoples, organizations, institutions make decisions like this all the time. The choices they make are almost always irrational in nature, because of, as previously stated, what is at the heart of the human condition – irrational decision making. Economic movement is driven entirely by selfishness. Producers want higher costs and more profit, consumers want smaller prices and higher savings. Third-parties become almost irrelevant this way, because what you're actually trying to do is bring the two to an efficient bargaining medium. Pareto efficient or not – you want one thing. Everyone wants one thing. **The Perfect Market.** In terms of specific economics, a state of production-consumption equilibrium where supply meets demand at the same price where marginal cost meets marginal revenue.

In order to tackle these issues, what one needs to do is assume a few things.

Those familiar with game theory will be also be familiar with the nature of **games.** Those that can be cooperative and non-cooperative. There's a consistent cultural phenomenon of sorts that teaches you to want to win. And you should. By all means. Go out there and win. There's one problem with this idea, however. People misconceive of sorts, some of which is down to cultural competitiveness, that winning must come at the cost of others. Economically, this isn't true. And while it isn't true, its falsity does NOT negate free-markets. The human condition has an extremely powerful element to it – the wisdom of the collective. When individuals make decisions with respect to their own free will across large populations, their mean outcomes tend to approach optimality. In economics, this creates a problem nobody's ever thought of before, that we'll approach later.

The fact of the matter is that life is in fact cooperative. Many will disagree with this, and there is good reason to. Darwin's theory of natural selection, for instance. Survival of the fittest. All the time. Every time. This does something to us, however. We spend years typing away, working hour after hour in a profession that we only pursue for our own well-being (finance-wise). That doesn't do anything to help the hundreds of millions of individuals in poverty, nor does it do anything to solve problems of hunger, inheritance inequality (inequality not because of merit, but because of inherited wealth, etc).

Charities aren't the solution to any of these, because money doesn't help. Pumping money into the machine only buys you time, but it doesn't solve the underlying problem for the simple reason that the machine doesn't work. We need a new machine; one that is efficient, maintains the dynamism of human behavior, as well as organizes them (institutionalizes them, if you like), to make **supply meet demand.**

And therefore, if we really want to minimize and eliminate economic inefficiencies, we must assume, or at least play life like we would a coordination game.

Imagine 50 million organisms of the same species fighting to survive. Ultimately, only 10 million reproduce and manage to contribute to the surviving gene pool. To the naked eye, 10 million organisms have won, and

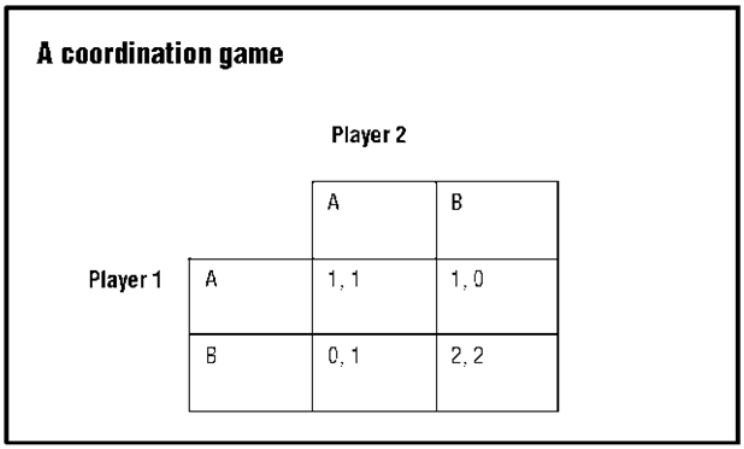
40 have lost. And that might be true, but what one needs to consider is mutual evolution. Without the losing 40 million players, there is no competition involved. The 10 million survivors never prove their worth. We don't consider them players because they aren't remembered, but without them, the entire system collapses in on itself.

The decisions that an individual makes is driven by his/her own interests, but if a number of individuals make the same decision with the interests of everyone repeatedly, then it has the potential to make everyone happy.

This isn't a case of simply dividing a resource equally. No. This is about making sure that everyone gets as many resources as possible, without compromising on any one individual's share compared to if he/she would have fought for it traditionally.

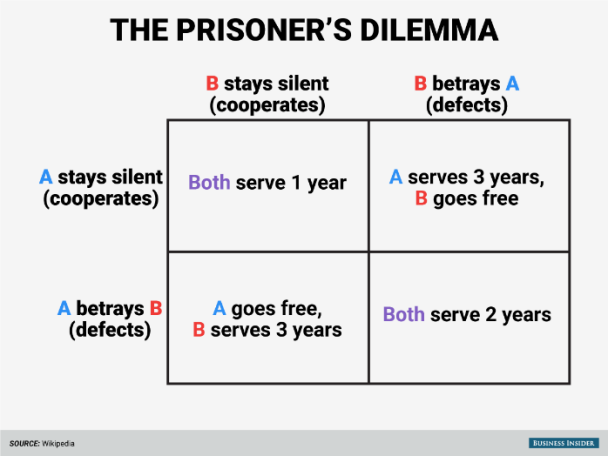
A simple example of a coordination game is as follows:

Fig 1.1



A coordination game is a type of game in game theory wherein the sum of all gains for both players is maximum at states where both of them **cooperate**. It is antithetical to a game with **Nash Equilibrium**, wherein maximum benefit lies in one player betraying the other (an example of such a game is the prisoner's dilemma.

Fig 1.2: Prisoner's dilemma



Institutions have consistently taught us that life is non-cooperative. And a lot of it is based on the premise that economics is a zero-sum idea. People believe it off the top of their head, but it's fundamentally flawed. The sum of all wealth, but more importantly, the sum of all potential gains is by no means, never was and will never be zero-sum.

The proof that the economy isn't a zero-sum mechanism is mathematically the simplest thing you'll ever see.

All transactions, between individuals and organizations, and all other 'players' is meant to be mutually zero-sum. This is what we've been taught. And this isn't true at all. It is zero sum, but only so in terms of money. In terms of transactional value, it is anything but.

Consider the following:

Fig A) Conventional Zero-sum idea

- The conventional zero-sum idea is how most individuals interpret monetary transactions. It is imperative to understand at this point, that financial and economic transactions must be separated in nomenclature. Financial transactions are to do with the exchange or transfer of money in the form of currency only, whereas economic transactions transgress across the exchanges of wealth and value. Economic transactions are inclusive of, but not limited to money.

Employer ⟷ Cash dispersed / Cash received ⟷ Employee

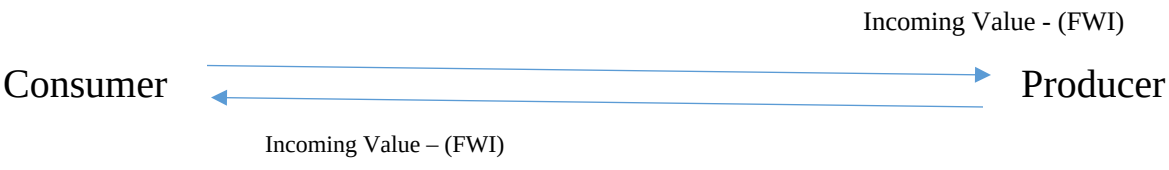
In terms of monetary status, cash dispersed by an employer does equate to the cash received at the end of its employee(s). The problem is, however, that this does not accurately represent the bargaining quotient of the relationship between the employer and employee.

Economics, as a science, speaks of the matter in a different way. What we're effectively analyzing is the consequences of human behavior on decisions that involve wealth and happiness. These things are binded together by one figurative quantity – value. Monetary, emotional, institutional etc. You can't put a price on a good education. Neither can you do so for a life-saving medical treatment.

Fig B) Real Transactional Value

As a result, the true transactional value of any exchange is subjective. Rationally, a consumer wouldn't purchase a good/service if he/she didn't find it beneficial to do so. For instance, if Consumer X values product X at $25, he/she will only buy it for $24.99 and lower – since from that point of price mechanism, the exchange is beneficial in the eyes of the consumer in terms of value. The same is true for producers. Any transaction requires the willing consent of two parties. And in order for the transaction to take place, both parties have to value their respective reception at a higher standing to their outgoing value (be it in terms of money, or a product).

Note: FWI stands for figurative wealth increase



The Money Misconception

A common misconception, or an assumed, unconscious presupposition that one often tends to make is that money is the fundamental proponent of an economy. This is by no means true. Think of money as a certification to entitlement – a piece of paper that entitles you to a product valued accordingly by its producer. The amount of money you possess indicates how wealthy you are. Nevertheless, how happy you are at any one point is dependent on how much value you can extract from the outside world. While more money makes it easier to do so, it doesn't automate the process.

Furthermore, economies crash. Money can become worthless overnight, and while currencies are backed by governments; governments aren't fail safe either. The only thing that isn't impermanent: is value. A house will always provide the same shelter regardless of how much it's valued at, for instance.

Chapter 2: Introducing the Problem

Economics – the science of social good. Termed and phrased in countless ways, it is but of one premise: studying how individuals behave in relation to the economy. It is with this assumption that I will proceed to lay out previously unchecked or undiscovered mechanisms (both market and non-market related) in order to establish a legislative basis for pulling the poor up in terms of wealth, while maintaining free market capitalism. The scale at which this transformation takes place, while only theoretical, is extraordinary.

There's a common saying among right leaning academics: Communism makes everyone equally poor, while capitalism makes everyone richer by different margins. Nevertheless, conjecture aside, it is only when this concept of equality is shoved aside that one can begin to observe a clearer picture of the problem. People have been addressing the wrong problem for decades now when it comes to capitalism. Everyone wants fairness. Fairness in what sense, however? In what dimensionality? Among whom? It's pointless trying to fight for fairness when in fact that only thing one should be fighting for is wealth. Governments and banks need to unite **not** to bridge income

inequality, but to **increase incomes**. Taxing the rich is a temporary solution, and so is social welfare. It's now time for a fundamental change in the way one thinks about economics – and not just in terms of production and consumption.

One of the faults of most capitalism inclined mixed economies, for instance, is imperfect information. Now, while it is already accepted by most that imperfect information will always exist in markets because of the continuous and dynamic nature of the information in question, should one not at least attempt to tackle it?

If the success of a market and the subsequent creation of wealth depends solely on the rationality of decision makers, then it's hardly a waste of time trying to maximize how rational economic agents can get.

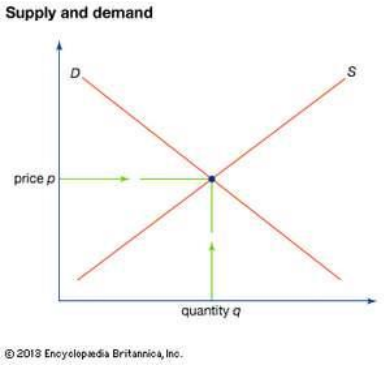
In this respect, one thing modern day economics heavily lacks is integration. For instance, imperfect information has been an economic problem for decades, but few, if any at all, have attempted to use coordination games (in game theory), or used payoff matrices to study them mathematically.

Complex concepts such as resource monotonicity must be brought in when one is considering the creation of wealth. Individuals with a work disincentive spend almost their entire lives stuck in a poverty trap because a relevant analysis of resource monotonicity is never taught.

In further application of game theory – the one goal of any game involving resource allocation (in our case: capitalist markets) is the involvement of Pareto efficiency or optimality. It's a known fact that capitalist markets deviate from this state, but hardly anyone has yet to attempt to minimize or even eliminate this deviation.

The following graph is one determining the inverse proportionalities of supply and demand proposed by Adam Smith. It's conjectural in some sense, that not all markets are bound to it (ie. Markets defined by rarity, such as jewellery).

Fig 1.1



There's a fundamental problem with this graph. Right away, you can see that it has only one mathematical solution. Those familiar with game theory will know that coordination games have multiple solutions.

Adam Smith's model describes only one price-quantity combination of production that ensures that supply meets demand for a given market, but this doesn't always have to be true.

For example, the theory that demand and prices and inversely proportional was built on the constituent that individuals care to save money, and essentially be cheap in every way possible. Like every other element of human behavior, this is malleable. Not via restrictive politics, but via nudges in the grand scheme of things.

Furthermore, they also imply that supply conjecturally increases with price motives – but there are other motives to production to, such as generation of employment.

One key outcome pointed out by John Nash, was that breaking the state of equilibrium in order to win a game is deadly if repeated by multiple parties. In repetition of betrayal, every party is left with little gain. Wars, political standoffs, sanctions – almost every political conflict is an example of this notion.

One way to look at this, is modelling economic games based on *truthful gain*.

In this context, *truthful gain* can be defined as a multilateral quantity that is directly proportional to how much the total payoffs add up to for all parties involved, as well as how fairly they are divided (closest to equitable payoffs).

For instance, consider the following Nash game.

1 \ 2	*A*	*B*
A	(**10**, **10**)	(25, 5)
B	(5, 25)	(15, 15)

The truthful gain in cell *AA* is smaller than the truthful gain compared to every other box, and it is a result of both parties betraying one another.

The truthful gain in cell *AB and BA* match at 30, but have low *truthful gain* since neither is fairly divided and one party suffers a significant blow in each case.

The most desirable solution to this game, though not stable, in the long term, is cell ***BB*,** in which case both parties cooperate having resisted the temptation to betray one another.

Controversially, such a solution is not stable since there is anti-cooperative incentive every time. Nevertheless, in real world games, it is the most optimal and mutually beneficial way to substantiate growth and development. It must be made clear that the setting in which such a solution is optimal is grand (both in space and in time). It I only with consistent repetition of cooperative strategy can all parties involved experience growth without compromising each other too much. One-time games are best played with the dominant strategy, while long term games are best played cooperatively.

In order to model this, *truthful gain* must be quantized. This can be done mathematically, by deriving a real world formula that approximates a description of what *truthful gain* means.

In order to quantize *truthful gain*, one must assume a mathematical variable associated to the formula that can be changed in accordance to the game being played.

In any game x, the primary objective is to identify the cell, or preferred outcome with maximized *truthful gain*. You can either pick an outcome

based on an inequality preference (ie. setting a criteria for truthful gain for choice of outcome), or based on relative advantage (picking the outcome with maximal truthful gain). The latter is to be chosen only in the case of a *forced game*, wherein all parties are forced to play the game and side with a move.

In a non-economic context, *truthful gain* is gain that is inherently honest, and doesn't necessarily come at the expense of others. Civilizations have always been built on cooperative intellect, and the modern world should be no different. We don't need a change in our capitalist economies. We need a change in the decisions we make while having free market freedom, such that to collectively grow in the long term.

Introducing the *Truthful Gain* Coefficient

Mathematically deriving truthful gain is not especially difficult. The two variables we need are a) summation of gains, and b) how equitably the gains are divided.

It must be noted that here, 'equitable' does not denote equality of outcome. The coefficient is being used purely to derive a preferential outcome for both parties if repeated in real world circumstances.

There is no requirement for any numerical exactness in the formula – only relative exactness. We need a model that compare payoff cells to each other on the basis of truthful gain and ranks them.

As a result, we will use a coefficient, denoted *Tg*.

Cell *p* denotes the cell with maximum *Tg*.

The truthful gain of any payoff cell can be found using the following:

$$Tg \approx \boldsymbol{\mu}(x,y) \cdot 1/1+\sigma(x,y)$$

μ(x,y): represents the mean of the gains in the cell concerned. For instance, in a cell with payoffs 12,6, **μ**(x,y) = 9.

1/1+σ(x,y): represents the indirect proportionality of the standard variance of the gains in the cell concerned. This is found by calculating the standard deviation of the gains x and y, by subtracting their means from each gain, squaring the values and averaging them. 1 is added to the

standard deviation of the denominator in case the coefficient ends up being 0, at which point the formula fails (since one can't divide by 0). However, given the formula requires only relative accuracy, we can add a constant to the denominator to prevent this problem.

The two quantities are multiplied as a vector, to result in a coefficient that relatively describes how advantageous a payoff is when considering a long term cooperative game.

Simplification:

The formula is originally written out as $\boldsymbol{\mu}(x,y) \cdot 1/1+\boldsymbol{\sigma}(x,y)$ in order to convey the indirect relationship of the coefficient to the standard variation of the gains. Simplifying this we get

$\boldsymbol{\mu}(x,y) \cdot 1/1+\boldsymbol{\sigma}(x,y)$

$= Tg \frac{\boldsymbol{\mu}(x,y)}{1+\sigma(x,y)}$

The formula above approaches the *truthful gain* coefficient of any pair of gains. As previously stated, the concept of truthful gain is not limited to two parties. As a result, the formula can be be generalized to fit any number of payoffs.

The generalized formula then becomes:

$$Tg \frac{\mu \to \aleph(1 \to \infty)}{1 + \sigma|\aleph(1 \to \infty)}$$

Tg represents the quantity *truthful gain*. The numerator necessitates the mean of the set of all gains (denoted by any number of gains from one to infinity). The denominator is 1 added to standard variation of the set of all gains (from one to infinity).

Example One:

Consider the following payoff matrix in a state of Nash Equilibrium:

For the sake of simplicity, we will be assigning decisional notations *A*, *B* and *C* to Rock, Papers and Scissors respectively.

	A	*B*	*C*
A	1,1	-3,5	5,-3
B	5,-3	0,0	-3,5
C	-3,5	5,-3	1,1

While this possesses Nash symmetry, a (1,1) outcome does not denote a lack of progress. In real world games, a (1,1) tends towards a non-zero sum outcome (as previously explained). To test this hypothesis, we can compare the *truthful gain* coefficient of cell AA, with that of cell AB (for instance).

$$Tg\ \frac{\mu \to \aleph(1 \to \infty)}{1 + \sigma|\aleph(1 \to \infty)}$$

$$TgAA\ \frac{(1+1)/2}{1 + \frac{(1-1)\text{^}2 + (1-1)\text{^}2)}{2}}$$

$$TgAA\ \frac{1}{1}$$

Cell AA therefore has a truthful gain coefficient of 1.

Checking for Cell AB:

$$Tg\ \frac{\mu \to \aleph(1 \to \infty)}{1 + \sigma|\aleph(1 \to \infty)}$$

$$TgAB\ \frac{(-3+5)/2}{1 + \frac{(-3-1)^2 + (5-1)\text{^}2}{2}}$$

$$TgAB\ \frac{1}{17}$$

As can be observed, the truthful gain coefficients of payoff AA and AB are 1, and 1/17 respectively. Although not necessary, payoff AA can therefore be termed seventeen times better than payoff AB in terms of truthful gain.

As is noticeable, there is no definite limit on the truthful gain coefficient of any payoff cell, as there is no limit on the numerator (the mean of the gains concerned). Therefore, two payoff cells can only be compared on the basis of *advantage*.

Truthful gain advantage can be modelled as a division of any two truthful gain coefficients.

$$Tg\alpha|x \uparrow y| = \frac{Tgx}{Tgy}$$

Where $Tg\alpha|x \uparrow y|$ represents the truthful gain advantage of payoff cell x over payoff cell y.

The generalized formula, on the basis of preliminary knowledge then becomes:

$$Tg\alpha|x \uparrow y| = \frac{Tg\ \frac{\mu \to \aleph(x)}{1+\sigma|\aleph(x)}}{Tg\ \frac{\mu \to \aleph(y)}{1+\sigma|\aleph(y)}}$$

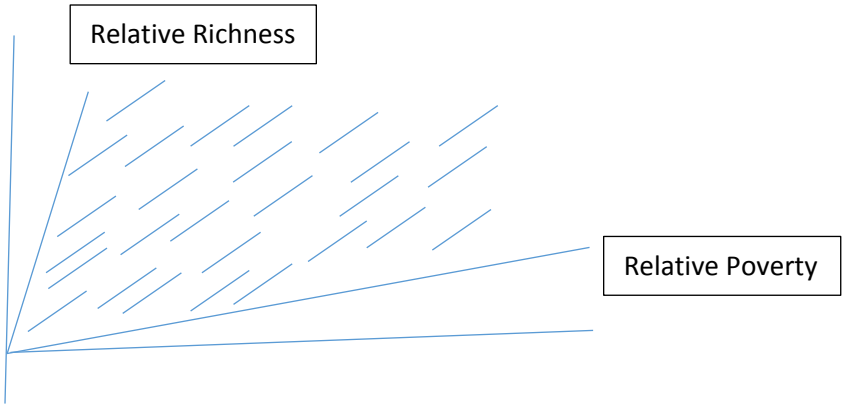
The above example consists of Nash symmetry, in which all the payoffs symmetrically have the same summation of games. This, however, is not a requirement to calculate truthful gain.

How Truthful Gain can reduce Income Inequality

> Truthful gain, quantized or not, is a relative measure of how wholesome a certain economic solution is. It doesn't necessitate inclusiveness. Instead, it encourages a solution more optimal for everyone, without compromise in the long term.

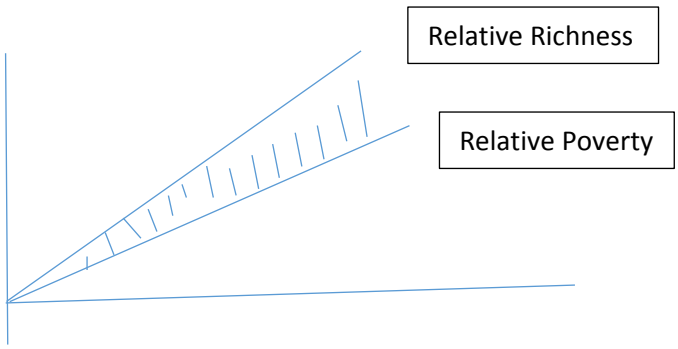
Income inequality is often modelled as a fairness issue, but this is not always the case. Money doesn't inherently belong to anyone. There's nothing ethically flawed about cut-throat capitalism. Nevertheless, most would agree is that every one of us has a social obligation to try and look after one another. To exhibit compassion. It is on top of this premise that one can attempt to solve the problem of income inequality by not bridging the gap between the rich and the poor, but by making the poor richer.

Income Distribution Model 1. {Current}



In the modern economy, relative richness exceeds relative poverty by a significant margin. This isn't because wealth is stolen from the poor. It's because the poor find it exceedingly harder to build wealth with the way in which the economy works. Relative richness and relative poverty can be bridged if supply meets demand.

Income Distribution Model 2. {Goal}



Reducing the deadweight cost will ultimately result in the bridging of extreme wealth statuses, resulting in the creation of wealth through figurative value (as explained above).

Chapter 3: Economic Philosophy

The key to reducing the deadweight cost by making collective decisions repeatedly, is to ask a few necessary questions in order to question the moral angle to modern day capitalism.

The Hijacker Hypothesis

Imagine a plane, with 200 people. A few minutes before the plane takes off, three individuals jump out of their seats and take control of the cabin. Needless to say, they are hijackers. They originate from a native religious sect that doesn't differentiate one life from five. And as a result, upon first contact with the outside world, they're willing to let all the passengers upon the plane go remaining one, whose life they shall take. If the decision rested upon you from an executive standpoint, would you make the exchange (unbeknownst to the passenger being sacrificed) randomly given there was a 50% chance more than one individual would die given the situation play out otherwise? Assume absolutely no political repercussions should you side with the exchange, as well as complete discretion and no threat to yourself.

When confronted with the question, most individuals would side with mathematical rationality. Given a 50% chance that more than one individual were to die, most would side with the exchange as it saves more lives than the alternative risk.

This is a question similar to the trolley problem, but with an added appendage.

Change up your frame of reference. If you were a passenger on the plane, and were given the decisional capacity in question – would you side with the

exchange? One might say yes in theory, but confronted to in a real world setting, one wouldn't be inclined to take the risk, knowing full well it could be their own life handed to the hijackers. The tendency to side with the alternative is indirectly proportional to the number of passengers on the plane.

Modern economics is not much different. Decisions to cut ties with employees are made in a split second, at the slightest hint of an industrial downturn. While it may not be visible immediately, these decisions create financial spirals that lead to the income inequality that everyone talks about.

Therefore, it is these decisions that one needs to look to influence through behavioral nudges, in order to reduce macroeconomic efficiencies in the long run.

The Equilibrium Paradox

A famous idea proposed in anthropological context is the wisdom of the collective. When an individual makes a decision based on intuition, its likelihood of success is considerably lower than the subsequent mean of decisions made by a group regarding the same problem. The larger the group is, the higher its likelihood of averaging a correct answer.

An experimental example is asking a chosen group of people the exact number of balls placed in a jar. Even if the number of balls were to be a specific, and not necessarily a multiple of 10, the mean of all guesses consistently approach the correct answer. Outliers on both ends tend to cancel one another out, and accurate guesses on both ends tend to do so, resulting in a mean that is considerably close to the exact number. With a large number of guesses, in several thousands, the resemblance can be frightening.

This element to human behavior isn't limited to guesses, or decision making. It tends to vary across anything to do with intuition. Human intuition tends to mean out to optimality, regardless of circumstance or environment.

One can shift this idea to economic gain too. Producers and consumers have opposing interests, as they are *non-cooperative parties.* Producers fight for higher prices, consumers fight for lower prices (the price-mechanism). It is this process that should even out to a state of *Pareto Optimality* (a state of resource allocation wherein one cannot mathematically improve one agent's condition agent without compromising another as well as the overall condition of the whole group).

It would seem that this was expected, especially with financial and economic transactions on the grandest of scales, taking place every day. If one were to model the entire world economy as one, large non-cooperative Nash Game, with financial symmetry, then you would expect the price mechanism to balance supply and demand, and have them meet consistently. This is not the case, however. Supply almost never meets demand, because bargaining is inefficient.

In a competitive market, marginal revenue will tend to approach marginal cost over time. If bargaining between two parties takes place efficiently, then the revenue settled upon for an employer should almost always tend to equal the cost of the product that the employer works to produce.

In order for a transaction to take place in a private environment, marginal revenue has to succeed marginal cost. However, as producers compete, this difference narrows down, and over time, marginal revenue approaches marginal cost with an increase in supply.

Marginal cost and revenue can be related as follows:

$$Mr - Mc = Ep + BCp + WCp$$

Mr = Marginal Revenue

Mc = Marginal Cost

Ep = Enterprise Profit – share of the profit diverted to the enterprise responsible for the product

BCp = Blue Collar profit – share of the profit diverted to the pay of blue collar workers (if any) responsible for the production process

WCp = White Collar profit – share of the profit diverted to the pay of white collar workers (if any) responsible for the production process

Solving the deadweight cost necessitates marginal revenue and cost approach one another wherever supply approaches demand.

While supply conjecturally meets demand at a certain price, a one-time SDE solution doesn't work. Instead, supply and demand have to be socially tied to one another, such that to simulate a near perfect economy.

Introducing Supply Demand Symmetry

SDS (Supply Demand Symmetry) effectually eliminates supply and demand inequalities by adapting an economy such that it inherently ties the two together. In doing so, an increase in demand will always be followed by an increase in supply, and vice versa.

One would assume that this would have to do with manipulating prices, but that's not always the case. A short-term, temporary fix would be to get rid of the price mechanism, and set prices at the supply demand equilibrium. But this is only temporary, as after a while, one of the two would fall out of sync. Instead, in order to establish a stronger economic bond between the two, one has to derive where each one comes from.

Demand, for instance, depends on two things:

1) Preferential Economics (which is dynamic)

2) Median Income (which is dynamic but over long periods of time).

3) Prices

Supply, on the other hand, is determined by three:

1) Production Costs
2) Prices
3) Demand (but only slightly)

The goal then becomes to link the two together in a manner that eliminates all the other elements of causation and leaves them both with only each other to fall upon.

Demand doesn't depend on supply, and for all intents and purposes, supply doesn't depend on demand either. It is only in the case of publicly owned industries that welfare is taken into consideration.

Both supply and demand depend heavily on prices, but not entirely on them. It is important to take this into consideration, because a common unconsciously realized misconception is that the price mechanism is all that determines the relation between supply and demand.

Demand is heavily determined by mean income (consumer affordability). This is dynamic, but over time. For the sake of simplicity, we will assume it to be static.

Revenue to demand is what production costs are to supply, inversely.

$$D: MI = S: 1/PC$$

If we assume similar proportionalities to both of them, then we can link demand and supply by linking production costs and median income.

If you remove technicality, median income and production costs are effectively the very same thing. Production costs are comprised of wages, pay etc. to everyone involved in the factors of production. This constitutes a lot when it comes to median income.

If you also assume the law of demand and supply to be in play:

Demand $\propto$ 1/Price $\propto$ 1/Supply

If we take marginal revenue and cost to proportionally determine demand and supply respectively:

$\text{MR} \propto 1/\text{Price} \propto 1/1/\text{MC}$

$\text{Or, MR} \propto 1/\text{Price} \propto \text{MC}$

And right there, we've proven that marginal revenue is directly proportional to marginal cost. Both of them are therefore inversely proportional to price.

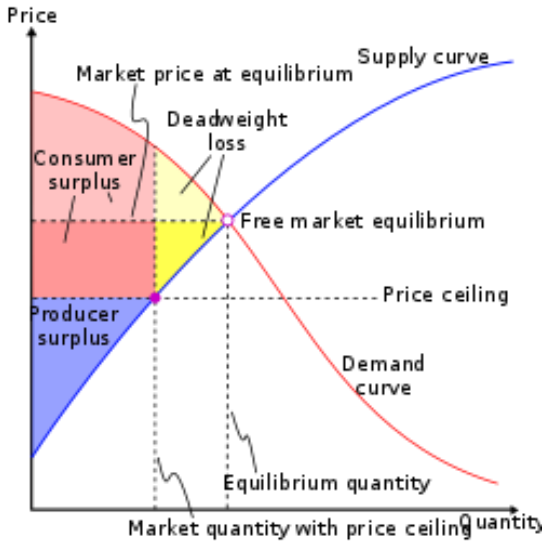
This is conditional, however, and is dependent upon prices increasing. When prices increase, marginal revenue and cost are inversely proportional.

Therefore, it is in everyone's best interest to match marginal revenue and cost at whatever price possible.

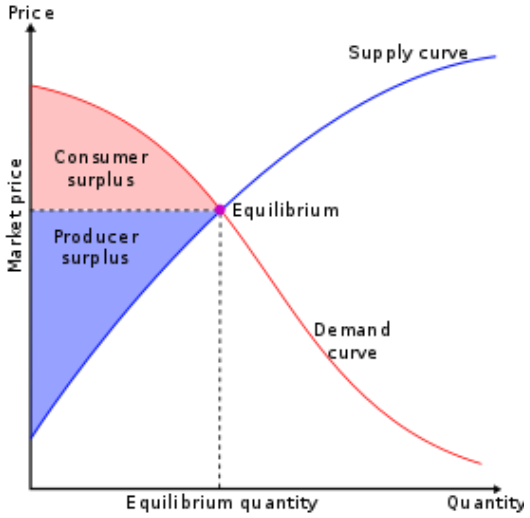
The current model proposes a conjectural model similar to supply and demand, wherein marginal revenue and cost meet at only one specific pricing.

In order to have supply, demand, marginal cost and marginal revenue all meet at the same point, one has to shift the either the point of free market equilibrium to match consumer and producer surplus, or vice versa.

Current Model



Goal:



Since the latter isn't possible if one has to maintain free market variation, the only option is to raise marginal revenue as well as marginal costs, until a market price that fulfills all 4 metrics is determined.

Marginal Revenue is given by:

$$MR\ \frac{\Delta R}{Qs}$$

Qs: quantity sold

Marginal Cost is given by:

$$MC\ \frac{\Delta C}{Qp}$$

Qp: quantity produced

Using the previously described formula that relates the two:

Total Profit:

$$Mr - Mc = Ep + BCp + WCp$$

$$\frac{\Delta R}{Qs} - \frac{\Delta C}{Qp} = Ep + BCp + WCp$$

At this point, to further differentiate the equation, we can describe two quotients:

The Blue Collar Quotient: The percentage of total profits diverted to blue collar workers in relation to the percentage of blue collar workers for the firm/company.

The White Collar Quotient: The percentage of total profits diverted to white collar workers in relation to the percentage of white collar workers for the firm/company.

The Blue Collar and White Collar quotients can be described as *BC, and WC* respectively.

Tp represents total profit.

BCw represents blue collar workers.

Tw represents total workers.

$$BC| = \frac{BCp}{Tp} \text{x } 100$$

$$\frac{\frac{BCp}{Tp} \text{x } 100}{\frac{BCw}{Tw} x\ 100}$$

$$\frac{\frac{BCp}{Tp}}{\frac{BCw}{Tw}}$$

$$\frac{BCp}{Tp}\ x\ 1/\frac{BCw}{Tw}$$

$$\frac{BCp}{Tp}\ x\ \frac{1}{\frac{BCw}{Tw}}$$

$$\frac{BCp}{Tp} \; x \; \frac{1}{BCw} \; x \; \frac{1}{Tw}$$

$$\frac{BCp}{Tp} \; x \; \frac{1}{BCw} \; x \; \frac{1}{Tw}$$

$$\frac{BCp}{Tp \; x \; BCw \; x \; Tw}$$

Hence, we have the derived formula of the blue collar quotient: describing the pay relation (in quantitative fashion), of blue collar workers in a firm.

$$BC \; \frac{BCp}{Tp \; x \; BCw \; x \; Tw}$$

A quotient above 1 describes a pay above proportionality (one that is admittedly rare).

Since the same elements of derivation are relevant to the white collar quotient, we can assign the counter formula:

$$WC \; \frac{WCp}{Tp \; x \; WCw \; x \; Tw}$$

Now that we have expanded formulas for both divisional quotients, we can come back to the original expansion:

$$\frac{\Delta R}{Qs} - \frac{\Delta C}{Qp} = Ep + BCp + WCp$$

Since $\frac{\Delta R}{Qs} - \frac{\Delta C}{Qp}$ can replace total profit as a constant:

We can substitute it into the quotients.

$$BC\ \frac{BCp}{\frac{\Delta R}{Qs} - \frac{\Delta C}{Qp}\ x\ BCw\ x\ Tw}$$

$$WC\ \frac{WCp}{\frac{\Delta R}{Qs} - \frac{\Delta C}{Qp}\ x\ WCw\ x\ Tw}$$

Having substituted the two into each quotient, we have now established a mathematical basis to calculate the pay equality of a firm in terms of its blue and white collar quotients.

It is important to understand that this derivation is not one of equity. It is perfectly formed because it doesn't describe pay division – but pay division in proportion to the employee structure to any firm.

It is, of course, not flawless, because it doesn't take into account leverage over the factors of production, but it is a pretty good indicator otherwise.

Likewise to truthful gain, we can call this quantity the aeque ratio (*aeque* being the latin word for fairness.)

The aeque ratio for a given firm, company, or free market can be described as follows, where $\boldsymbol{A}$ is representative of the ratio.

$$\boldsymbol{A}\ \frac{WCp}{\frac{\Delta R}{Qs} - \frac{\Delta C}{Qp}\ x\ WCw\ x\ Tw} : \frac{BCp}{\frac{\Delta R}{Qs} - \frac{\Delta C}{Qp}\ x\ BCw\ x\ Tw}$$

The formula above, for the *aeque quotient*, is a proportional description of how fair a pay structure is in relation to employee structure. While it does not account for productivity, it is highly indicative in nature.

The aeque quotient can be further modified to fit a normative description for any set of workers of any type, not just blue and white collar divisions.

Nominal adjustments can be made to account for productivity and leverage, but they'd have to be based on a numerical assignment. Such a numerical assignment (of a number) is unlikely to be universal, and will only result in a bigger difference of opinion.

Currently, therefore, we have established two formulae that describe advantageous benefits between two quantities:

1) **Truthful Gain Advantage: the ratio describing the quantitative differences between any two payoffs on the basis of truthful gain.**

$$Tg\alpha|x \uparrow y| = \frac{Tg\ \frac{\mu \to \aleph(x)}{1+\sigma|\aleph(x)}}{Tg\ \frac{\mu \to \aleph(y)}{1+\sigma|\aleph(y)}}$$

2) **Aeque ratio: the ratio describing the quantitative competence of a pay structure in relation to its employee division.**

$$\boldsymbol{A}\frac{WCp}{\frac{\Delta R}{Qs}-\frac{\Delta C}{Qp}\ x\ WCw\ x\ Tw} : \frac{BCp}{\frac{\Delta R}{Qs}-\frac{\Delta C}{Qp}\ x\ BCw\ x\ Tw}$$

The two metrics have a common basis upon which they function: growth that doesn't necessitate inclusivity.

It is imperative to take into account the fact that no one human being has ever presided over anything substantial relative to human history. A lifetime is a little over 70 years on average, and almost never exceeds a century. While a century can be exponentially significant when it comes to human progress, it is not nearly enough to observe the entire spectrum of things. And as a result, most of us are inherently given a choice: to spend all our lives making decisions for ourselves, and ourselves only, or to try and be self-sacrificing for what becomes the bigger picture. And while the former may be encouraged, it is also important to point out that in doing so, we create resistance for everyone

else. Someone's utility is almost always someone else's loss, and as a result, when everyone maximizes their utilities without regard – nobody truly grows.

Growth, isn't defined by wealth. While wealth may indicate growth, the growth of a state, or a nation is fundamentally reliant on how useful its members are to a functioning society (education, medicine etc.). In order to optimize everything we have, we can't fire on all cylinders on all measures at the same time (at least not at first).

It doesn't necessarily come down to a do or die sacrifice; a choice between you and everyone else so to speak. It isn't even a concrete precedent, or a doctrine. It is but a perspective that one may or may not consider when making decisions, but one that everyone should certainly be introduced to. What truthful gain and the aeque ratio ultimately tell us, is in most free market systems, income for any party is mutually compromising, because of a competitive attitude. And while this does create more wealth, and is absolutely necessary to every economy in the world – the fact remains: there are very, very few winners to modern day capitalism.

And being a winner when it comes to capitalism, isn't too far of a stretch such as to being a winner at life. And this makes it a moral question as much as an economic one: are we okay with the majority suffering, if we happen to be a part of the winning minority?

If modern day economics really is to be modelled as what is an optimization game (and it can be done using normative mathematics), then we can begin to allocate resources in a manner that creates wealth (by raising the median income). If we don't optimize, however, we're left with a broken machine. The goal isn't to eliminate poverty, it is to create an economic model in which poverty is much less likely to occur.

We can keep claiming to help by funneling money and resources below, but that results in nothing substantial. Aid is short term. Education is long term. Individuals without the benefit of inherited wealth need to be able to create their own.

A common political notion when it comes to matters like these, is that there simply isn't room for everyone. Whenever one hears that, we tend to cram and compete like there isn't room for everyone, when the real solution is to make the room bigger so that it fits everyone.

Free market competition is important, maybe even necessary. Nevertheless, it is integral to differentiate between mutually compromising, and mutually beneficial competition.

Mutually compromising competition is that which takes place when we assume a zero-sum game, and fight for our own utility at the expense of others (consciously and sub-consciously). Mutually beneficial competition takes place when players in a game (consumers, producers, firms etc.) productively compete with one another to lower prices (for instance).

Mutually compromising competition eventually leads to a state of *Pareto distribution*, an inequality status describing the top 80% of a group's wealth lands up in the hands of only the top 20% of individuals in the group (at least approximating it).

Mutually beneficial competition, on the other hand, leads to increased income, increase in general welfare, productivity and affordability. Contrary to what many might imagine, there is a plausible economic optimization in which everyone wins, where 'everyone' defines the set of all producers, consumers, firms etc. as well as the government.

Resistance to Economic Optimization

Economic optimization must be differentiated from fair division. There is no division such that it can be termed 'fair', objectively. In fact, economic optimization does not call for a division at all. Resource allocation is primarily about three things, as is academically enforced all the time:

1) What to Produce
2) How to Produce
3) For whom to produce

The first condition, what to produce, is answered by the free market on the basis of supply, demand, prices and profit incentives. The second condition is also determined on a likewise basis. If we want to maintain the moral angle to free markets, then we leave both of them untouched. However, the third condition is a variable of another metric: who can afford to pay the most.

In private sectors, money is prioritized. In public sectors, welfare is prioritized. And this is where most governments used mixed economies to distribute resources more equitably.

It may seem impossible, but there is indeed a way out of this – a way of maintaining the private nature of a sector, as well as ensuring money isn't the only thing that determines who gets what.

The premise of the problem at hand, is the fact that firms, organizations and producers are motivated by money on an inherent basis. If one has to change the decision making these parties make, then one has to alter what they are motivated by. While it might seem like there is no surefire way to do so, there is something one can at least attempt.

Imagine a market, where money wasn't the only thing producers were motivated by. If governments could devise a way such that to make public welfare a concern of firms too, then that would significantly change how they'd be inclined to make production decisions.

Doing this, of course, is a lot easier said than done, but it is plausible. A reasonable metric of welfare is employment. Not necessarily high paying employment, but employment that ensures some form of productivity. In most mixed economies, there's a concept of minimum wage, that most firms are forced to abide by. However, a government could easily offer firms the following exchange:

Welfare Exchange

The Welfare Exchange goes as follows.

Suppose the minimum wage for any relevant firm is 7 dollars an hour, and the product of that labor sells at 20 dollars. 20 dollars may not be something everybody can afford, and it is in a government's best interest to bring it down to purchasing power. A government could therefore offer the firm a contract asking it to reduce the price of its product on a temporary or permanent basis to 15 dollars. In exchange, it could allow the firm to bypass its minimum wage law for a number of new workers. As a result, the firm recovers money lost in selling the product by paying less to laborers. Why is this beneficial? This contract not only reduces the price of the product the firm is selling (and increases consumer surplus), but also incentivizes the firm to hire new workers (be it at a lower wage). In the short term, this boosts employment and productivity, increases welfare and has very few downsides.

This is, by no means, a violation of the free market. Instead, it's a non-enforced exchange offered to a firm, by its jurisdictional government that has public welfare in mind.

While this does require government interference, it is important to take into account the following:

There is no single purely capitalistic environment that has ever allowed for the collective growth of its players without compromise, and there is no single purely communistic environment that has ever allowed for any growth at all.

Chapter 4: The Problem with Politics

The fundamental hindrance to solving macroeconomic inefficiencies is hidden in plain sight: politics. The Capitalism vs Communism debate ended a long time ago, but its argumentative remnants prevent any real progress from taking place. The world economy is a machine that's broken, and nobody's willing to fix it – for they feel it requires tremendous compromise on their own part. It doesn't. It requires a change in short term decisions, and has everybody's growth in mind;

even the wealthy. **The only way for a civilization to grow is for every one of its members to grow individually; for it is impossible for a bird to prosper without every one of its feathers and wings intact.**

Shoving non-succeeding individuals under the radar won't do anything except mask a problem that needs to be solved, not ignored.

It is at times like these when one needs to go back to the moral teachings that once built the economy, such as those of Adam Smith. In his famous book "The Wealth of Nations", he consistently argued that the most optimal decision in any setting is made when the relevant player selects the best outcome for himself/herself AND the group. It is only when you take the group into account, when everyone wins. On the other hand, if one is selfish, everyone ends up cancelling each other out, because as is known well – **selfish interests are always mutually compromising.**

If mutually compromising selfish interests are pursued relentlessly, then then only those who are intelligent and conscientious win. That's a problem, because not everyone is intelligent and conscientious. What's even more worrisome is very, very few people are intelligent, let alone conscientious too.

The ideal economy would allow for meritocracy among all traits, including creativity (which is often a trait seen in those who don't rank high in the previous two). Either way, the number of people can reasonably be expected to succeed in a free market increases drastically in the long term.

The average IQ, worldwide, can be approximated to hover around 100 with reasonable consensus, if not lower. That is nowhere near enough to even approach a guarantee of success.

If you have an intelligence or a temperamental mismatch that tilts the game almost entirely in favor of one group, is it ethical to not tilt it back? While tilting it back may take away your inherent advantage, it will make the game better at doing what it is supposed to do: reward meritocracy. Not everyone is intelligent, and not everyone can be. As a result,

intelligence can't be the only, or one of the few metrics that determine capitalistic success.

If we don't find a way to change how people make decisions, we're headed for a calamity of unheard proportions. Ultimately, selfish interests facilitate cut-throat profit incentives, which are at the heart of multiple externalities: the most notable of which is global warming and climate change.

One can observe any successful civilization throughout history – and can observe that its success has been built on truthful gain. Civilizations haven't compromised – they've collaborated to help each other grow. If they didn't, they'd eventually always fight to death. The result of the fight, would of course, be signified by a civilization that once was, but destroyed itself.

Politics is, and has always been about self-interest. It's been about power. And power, if not used for the right things, can devolve into a menace. Legislation isn't going to fix the economy, people are.

When a group of people come together, to accomplish something previously thought to be impossible, the odds of pulling it off depend solely on the collective will of everyone involved. Every great thing that has ever happened to anyone, has required some amount of sacrifice – the amount being proportional to how great the reward is. Pulling everyone out of poverty isn't going to happen by funneling cash down the capitalistic hierarchy. It's going to require a change in the decisions we make, so those poorer than us have the chance to make a decision at all.

This, when aggregated into an overview, is what is going to be the defining issue of the twenty first century. The economy, in this sense can be compared to a free flowing fluid (symbolizing a free market). Its growth and size depends on the container the fluid is held in, but ultimately, its state is determined by the movement of each every particle of the fluid. Every tiny bombardment, every collision, changes the course of the fluid in the long term – sometimes even drastically,

when it becomes the reminiscing of the butterfly effect. Every transaction, every individual in an economy matters – because a single decision can set off a chain of events that can have magnanimous consequences on everyone.

For instance, every time a transaction is made, there is a transfer of affordability from one party to another. That affordability is passed on continuously, perhaps even millions of times, split up, redistributed until it is no longer valuable (destroyed in the case of cash).

It may not be computationally possible to predict the axiomatic consequences of each unitary transaction on the world economy, but it is certainly possible to say with a fair amount of certainty that its effect is relevant.

In order to further study this, we have to closely examine the concept of *transactional potential*.

Transactional potential is defined by the tendency of a group, defined by demography or geography, to make transactions. The *Tp* of a group is dependent on group size, type, specifications and spending power.

When the quantities of certain transactions is modified in bulk, it opens up room for affordability in other areas with transactional potential. As a result, it automatically tends to result in spending that is distributed, rather than concentrated.

The most fundamental element to any set's transactional potential, is that it is always equal to the sum of the transactional potential of its subsets.

<u>The Transactional Potential Equation</u>

The variables of transactional potential are as follows:

1) The size of Group *G* (*in terms of players P, where one player is defined as an entity capable of making unitary transactions).*
2) Time *T allotted to the group to make transactions*

3) Capitalistic Tendency *C, a score of 1-10 defining how free market the group is – 10 being the most free (in the case of a nation or state, defined by the Index of Economic Freedom).*
4) Spending Power *S, defining the total GDP, or per annum income of the group.*
5) Rate of Inflation *R, relevant to the spending of the group*

In identifying so, a simplified equation to determine the transactional potential of a group is as follows:

$$TpG\ \frac{c \times s \times p \times t}{R}$$

Since transactional potential is variable and continuous, its determination can never be exact. Therefore, approximating *Tp* values for groups necessitates using quotients that are relevant to their specificities.

However, the general formula (written above) is accurate for most normative contexts, because transactional potential ultimately points down to a vector multiplication of the first four variables ***c, s, p and t***. The first variable, capitalistic tendency *c*, determines how free the economy is. The more work-centered an economy is, the more transactions it facilitates. The more entitlements in an economy, the fewer transactions it facilitates. In other words, this measures the ***willingness*** of players to make transactions.

Secondly, spending power *s*, can be defined in any unit as the purchasing power of the group in question. Its most obvious indicator is the GDP of the group, or its per annum income. The aggregate spending power of a group subsequently represents the ***capability*** of players to make transactions.

Thirdly, the size of group G in players *p*, an obvious factor in the *Tp* metric, is determined by how many players make up the group and can contribute to its economy – otherwise measuring the ***availability*** of players to make transactions.

Fourthly, and the last variable on the numerator – the time *t* allotted to the group is a proportional measure of the ***possibility*** of any one player willing, capable and available, being able to make a unitary transaction.

The four variables, that determine that willingness, capability, availability and possibility of a high transactional potential are counteracted by the rate of inflation in the denominator. The inverse proportion exists because a higher rate of inflation increases price that reduces both the willingness and capability involved in any potential transaction. Fewer transactions are likely to take place.

Once again, it is important to reinstate that the transactional potential of any group remains the same, even if the group is broken up.

To represent this, we can equate the transactional potential of group G to the sum of that of two of its subsets.

Where $g \subseteq G$, $\mathfrak{g} \subseteq G$ and $(g + \mathfrak{g}) = G$:

$$TpG\ \frac{c \times s \times p \times t}{R} = |\ \{\ Tpg\ \frac{c \times s \times p \times t}{R} + Tp\mathfrak{g}\ \frac{c \times s \times p \times t}{R}\ \}\ |\ TpP$$

Studying transactional potential clinically makes it easier to identify how groups defined demographically or geographically affect one another by making transactions based on inherent selfish interest.

It must be noted that transactional potential is neither equal to, nor proportional to purchasing power. Purchasing power defines the capability of an individual to purchase a certain good on the basis of affordability, relative to that of another player. Affordability, however, is only one of the things tackled by transactional potential.

Likewise to purchasing power parity, transactional potential parity is a state of equilibrium between two groups, achieved when the mean player from each group is said to hold the same potential for successfully making a unitary transaction. This is constituted by the notation *TpP*.

Having consolidated this, we have now derived three fundamental behavioral equations that determine the competence of an economy:

1) **Truthful Gain Advantage: the ratio describing the quantitative differences between any two payoffs on the basis of truthful gain.**

$$Tg\alpha|x \uparrow y| = \frac{Tg\ \frac{\mu \to \aleph(x)}{1+\sigma|\aleph(x)}}{Tg\ \frac{\mu \to \aleph(y)}{1+\sigma|\aleph(y)}}$$

2) **Aeque ratio: the ratio describing the quantitative competence of a pay structure in relation to its employee division.**

$$\boldsymbol{A}\frac{WCp}{\frac{\Delta R}{Qs}-\frac{\Delta C}{Qp}\ x\ WCw\ x\ Tw} : \frac{BCp}{\frac{\Delta R}{Qs}-\frac{\Delta C}{Qp}\ x\ BCw\ x\ Tw}$$

3) **Transactional Potential: the tendency of a clearly defined group to make economic transactions.**

$$TpG\ \frac{c\times s\times p\times t}{R} = |\{Tpg\ \frac{c\times s\times p\times t}{R} + Tpg\ \frac{c\times s\times p\times t}{R}\}|\ TpP$$

The most effective solution to the broken economy is economic optimization, as it is the only way around selfish interest. This optimization must be differentiated from a *profit optimization* (that describes the utility of choices made by a firm based on revenue). This optimization is founded on the idea of truthful gain (creating as much wealth for as many individuals as possible).

Chapter 5: Economic Optimization

Modelling economic optimization effectively requires following variables

A) *Initial Consumer Decision Point: C*
B) *Final Consumer Decision Point: C1*
C) *Initial Producer Decision Point: P*
D) *Final Producer Decision Point: P1*
E) *Consumer Cost of Immediacy: Cx*
F) *Producer Cost of Immediacy: Px*
G) *Relevant Interference: RI*
H) *Benefit of Optimization: B*

C represents the metric of the decision that a given consumer is naturally inclined to make (mostly on the basis of saving money). C1 represents the metric of the decision that the same consumer makes at the end of the relevant interference (RI). RI is subsequently measured by the products of how distant C and C1 are, and how distant P and P1 are.

The consumer cost of immediacy, Cx defines the nominal cost suffered by the consumer at C1 instead of C, and Px defines the nominal cost suffered by the producer at P1 instead of P.

The benefit of optimization, to the consumer, producer and market, is defined by the truthful gain advantage of payoff (C1, P1) over (C,P)

The primary objective of any optimization is not to maximize relative interference. It is to maximize the benefit of optimization, while keeping the costs of immediacy to the consumer and producer (Cx and Px) low. Since the costs of immediacy, and the benefit of optimization are **mutually compromising** (ie: they compromise one another upon increase), we will use truthful gain to model an appropriate outcome.

Any given variable above is graphed on the basis of a payoff. For instance, P, the initial producer decision point is graphed on the XY plane on the basis of a payoff value (such as the amount profited by the sale on default).

Optimizing the Economy

Linear programming, a fairly basic mathematical concept is ideal when considering optimizing the outcomes of multiple transactions.

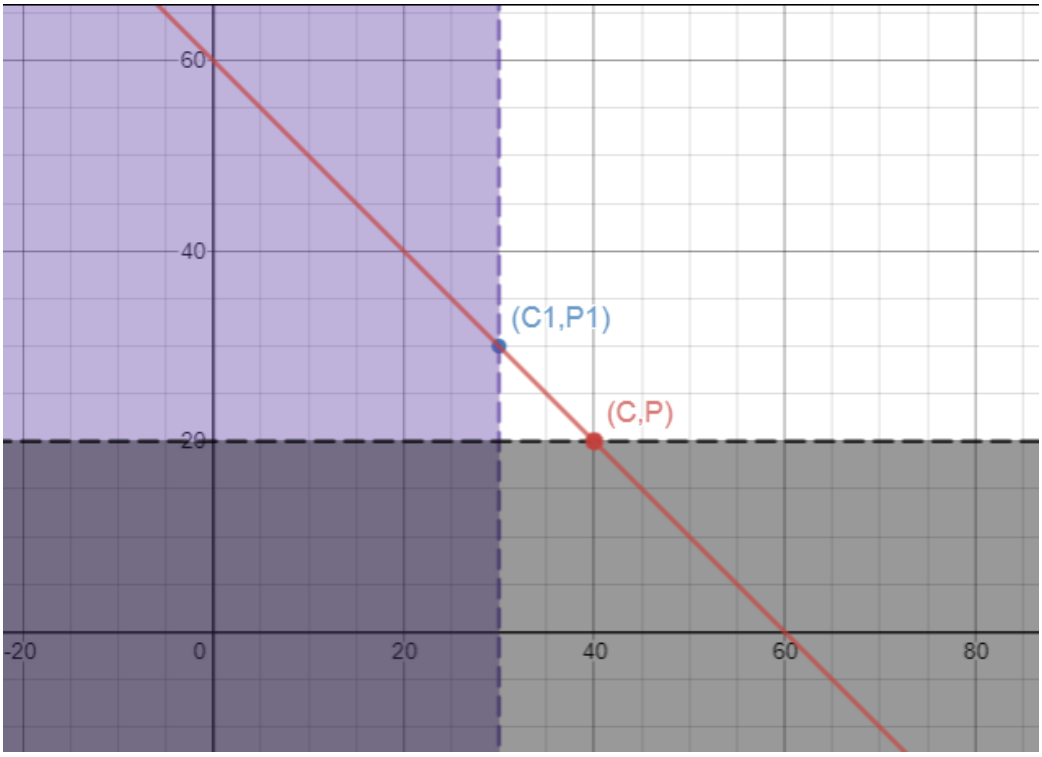
We'll use multiple points (with pairs of consumer and producer payoffs, both initially and finally), plot multiple transactional lines. This will create a set of inequalities, and we'll pick the point, or the outcome with maximum payoff.

The points for any one transaction are

1) (C,P)
2) (C1,P1)

These two points will be graphed, and then joined using a linear line. This will be repeated for multiple transactions.

Graph 1



The first graph represents one instance of relevant interference changing the payoffs of a transaction. The two payoffs in question are (40, 20) – (C, P) and (30, 30) – (C1, P1)
The relevant interference can be defined as the distance formula, which here equates to 14.14 (approx.) units.
The benefit of optimization, as defined previously, is as follows:

$$Tg\alpha|x \uparrow y| = \frac{Tg\ \frac{\mu \to \aleph(x)}{1+\sigma|\aleph(x)}}{Tg\ \frac{\mu \to \aleph(y)}{1+\sigma|\aleph(y)}}$$

$$Tg\alpha|x \uparrow y| = \frac{\frac{30}{1}}{\frac{30}{11}}$$

$$Tg\alpha|x \uparrow y| = \frac{30}{2.72727..}$$

$$Tg\alpha|x \uparrow y| = 11$$

Therefore, the benefit of optimization for this particular transactional change is 11 (ie: (C1,P1) is eleven times a better outcome than (C,P) in terms of truthful gain.

However, this benefit comes at the cost of immediacy to the consumer, who stands to make a better payoff with decision *C* than *C1*. The cost of immediacy can be calculated as a percentage value of the total payoff, which becomes:

(40-20)/60 x 100

= 33.33%

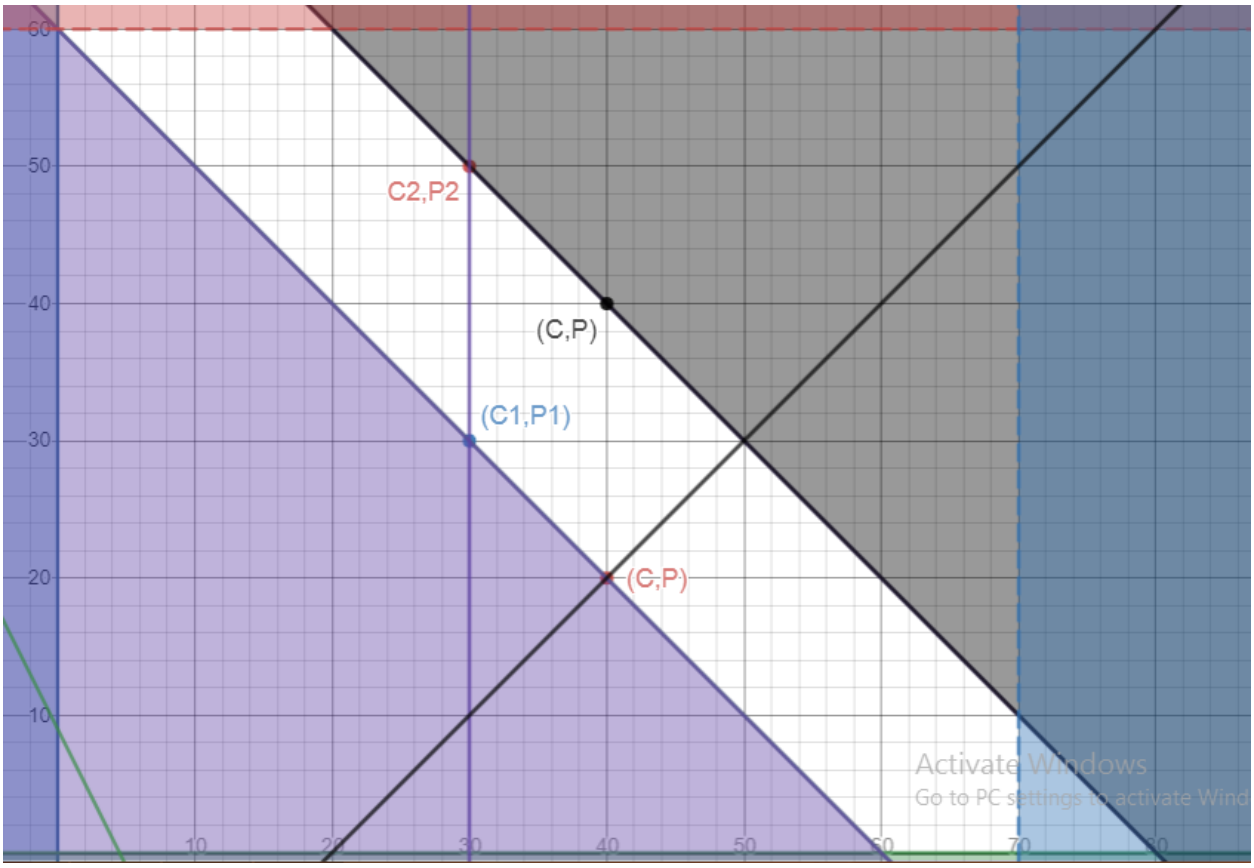
Or a 1/3 *Cx*.

However, the consumer cost of immediacy, needless to say, is always equal the negative counterpart of the immediate benefit to the producer ie. producer's benefit of immediacy. Therefore, the producer benefits by a factor of 1/3.

While the consumer falls short at the time of the transaction, an important risk is averted. If either the consumer or the producer were to become too selfish in the process of negotiation, then they would risk having the entire transaction fall apart. This would result in a null payoff, or no payoff at all for either the consumer or the producer.

The line that the points on Graph 1 fall under, is defined by the linear equation x+y=60. In real world economics, we can model this as a transactional equation that defines one set of linear transactions. Plotting multiple linear equations therefore gives us an inequality set, like the real world economy.

Graph 2, with 1 more equation and relevant surplus limits



The limits x>70, and y>60 define consumer and producer surpluses in the economy. Within their limits, the 5 points form a region of optimality, whose points can be modelled for benefit.

The 5 points are as follows:
(30, 30)

(40, 20)

(50, 30)

(40, 40)

(30, 50)

Since three of the points have a higher total payoff (80), than the other two (60), the other two are eliminated.

From the other two, (30, 50) and (50, 30) have a similar truthful gain quotient. (40, 40) on the other hand has a truthful gain advantage over both of them, making it the most optimal payoff outcome.

The same graph can be expanded to fit the needs of the financial industry (purchasing and selling stocks), or used to determine optimal purchases of gold, petroleum etc.

Linear programming can also be used to assess risk options, when considering investment in the long term.

Ultimately, all economic downturn is a result of one thing: imperfect information. When consumers and producers make decisions for their own short term gains, they are essentially passing on options that will result in higher total payoffs when the economy settles. Furthermore, this anxious nature of decision making also results in the downturn that caused it in the first place, to last for a longer time. On the other hand, if one were to make reassurances, spending and buying would equalize at a much faster rate, causing the economy to boom again.

We've accepted that recession cycles are inevitable, but they only take place because of predictable human behavior. Any recession is the result of dangerously low economic activity, which in turn depends on individual transactions.

If we were to collectively change how we thought about each transaction, the recurrent chain of events causing periodic recession would eventually dissipate. If everyone begins to think rationally, or in terms of the national economy rather than their short term finances, it'll eventually result retention of employment, wealth increase and a massive reduction in income inequality.

These changes don't even have to be drastic – if even 10% or so of all transactions were to be compromised upon, the benefit to the economy will be notably, and quantifiably large. These changes might even be subject to experimental, or empirical testing. By modeling the economy as a permutation game, one can easily observe the effects of one transaction upon another. With the help of an algorithm, it may even be possible to predict them.

Chapter 6: Overcoming Selfish Interest

The aggregate of these mathematical solutions is but wasted if we don't find a way to change how we think and behave while making transactions. This is because of the resistive proponent of selfish interest, which can be looked at in the following manner:

1) All players in a non-cooperative game are naturally inclined make decisions in accordance to what produces the best outcome for them in that moment
2) If they don't make a decision that satisfies the above principle, it is either because they are forced, or persuaded from their initial view to do so

The majority of social and political maneuvers are made on the premise of selfish interest, and are made on the understanding that they will benefit the

player making them with immediate payoffs. These are inclusive of investments too, as though they are made on a risk-reward basis, they are made in the promise of sole economic gain.

In order to gradually change the behavioral patterns of the players in an economy, one has to divulge into the psychological solutions. While the welfare exchange is an example of an offering that firms might or might not take, it requires a prompt to get them to do so. It's an active solution – one that requires a perpetual form of action to be accessible. The world economy, however, on its size and scale, requires a passive one – a solution whose origins are psychological in nature and come from within, rather than from a prompt.

Further examining the transactional potential equation,

$$TpG\ \frac{c\times s\times p\times t}{R} = |\{Tpg\ \frac{c\times s\times p\times t}{R} + Tpg\ \frac{c\times s\times p\times t}{R}\}|\ TpP$$

It is clearly observable that each of the four elementary variables in the numerator can be differentiated on malleability. The capitalistic tendency of a group depends on its overall spending behavior. The spending behavior of a group is subject to an averaging game, and can therefore be termed less malleable. The spending power of a group, comes from its income, which is moderately malleable. The third and fourth variables, p and t, size and time can be changed at any given point.

The ideal economy is one that grows every year at a logarithmic rate. This rate of logarithmic growth is applicable to almost everything – income, population, rate of inflation etc. As it continues to grow, the group becomes wealthier and its behavior changes accordingly.

Ultimately, the one outcome that indicates a successful economy is the level and wholesomeness of economic activity. We want as many people making transactions as possible, and making as big as transactions as possible. In order to increase transactional potential while maintaining time and size, one needs to increase spending power and capitalistic tendency. This can be done by encouraging producer competitiveness (which increases c), while at the same time temporarily helping welfare (lowering taxes, interests etc) – which

increases s. Over time, as the level of economic activity in a group increases, people will start to flourish. Supply and demand will increase proportionally, or close to proportionally, resulting in a subsequent increase in employment – which in turn will increase pay.

There's one problem with this. The said increases in employment and pay will not be equitable, and will side to a state of Pareto inequality. Why? Encouraging economic activity is not all that's required. Encouraging economic activity in low-income groups is too. Otherwise, the capitalistic tendency of a group takes over, and leads to a state similar to that seen in the world economy today.

This brings us back to transactional potential:

$$TpG\ \frac{c\times s\times p\times t}{R} = |\{Tpg\ \frac{c\times s\times p\times t}{R} + Tpg\ \frac{c\times s\times p\times t}{R}\}|\ TpP$$

For the sake of simplicity, let's assume two subsets in the group TpG

Tpg and Tpg

This is the pair that makes up the larger group *G*. Let's assume the two groups have similar capitalistic tendencies, sizes, and time allotted but differing spending power. The two of them divide group *G* in half, with 50 players each. They have a spending power, determined by GDP, of 100,000 and 500,000 dollars respectively. They've both been given 1 day to make transactions, and have a *c* ratio of 7. Both of them have a rate of inflation of 2% per year.

$$Tpg\ \frac{7x100000x50x1}{2}$$

$$Tpg\ 1.75x10\text{^}10$$

$$Tpg\ \frac{7x500000x50x1}{2}$$

$Tp\mathcal{g}\ 8.75x10\text{^}10$

As can be noted, the two subsets have vastly different transactional potential ratios, because of differing spending power. Spending power is more inherent than it is not, so we know that it isn't always the most moral metric. On the premise of truthful gain, we would want to increase the spending powers of both subsets, but increase them at different rates such that to help the first one match the second eventually. In order to do this, we increase the spending power of the first subset at a faster rate than the second. This is completely different from wealth redistribution – which involves indirect giving from the rich to the poor; that's not what's happening here.

Since the aggregate sum of both *Tp* ratios equal the total transactional potential of group *G*, we can then work on balancing them out.

$$Tpg \uparrow \frac{c \times s \times p \times t}{R}\ Tp\mathcal{g} \downarrow \frac{c \times s \times p \times t}{R}$$

There are multiple ways to do this without touching either group's wealth. One can either modify the time allotted to one group to make transactions, change the capitalistic tendency of one over the other, increase or decrease the rate of inflation in one group over the other. Changing the size of either group is not an option, since that is deterministic.

Once we alter the transactional potential in one subset, it will symmetrically result in an alteration in another (assuming two subsets). If there are three subsets, one can be modified to alter the other two symmetrically, and so on.

The only reason this works is because the total amount of wealth in a group, will always equal the added sums of the wealth in its sub-groups if split into them at that exact point in time.

Addressing whether or not neutralizing selfish interest is possible

For the most part, biological organisms have invested in selfish interest to grow. While some altruistic behavioral traits have been proposed in certain branches of evolutionary biology, for most species, it is of consensus that the default goal, for an organism, in evolutionary terms, is to survive and pass on its genes at whatever cost.

This, along with many other facts of nature, facilitates the question: Is abandoning selfish interest even possible? One can certainly encourage it, (eg: the welfare exchange), but it may not be possible to actively force it.

As it turns out however, one might not need to. Ultimately, the aggregate of all economic behavior is based on a consistent psychological determinant. Altering that determinant, in theory, would mean permanently changing how groups behave.

This might seem immoral at immediate sight, but that's not necessarily the case. Remember – changing one's psychological determinant solely by providing information (with consent) does not take away one's free will – which is what effectively forms the basis of a free market. Choices still exist in full, but the willingness to make one choice over another goes up significantly. Ideally, this contrast should favor choices that represent the economy's best interests – wide-scaling purchasing power and high employment.

Even if the said change isn't as wide reaching as one might hope for, its effects could be more than beneficial. The objective of any such attempt won't be to reach as many people as possible. Instead, it'd be to make as much of an impact as possible on a person-by-person basis. As previously stated, a single economic transaction can lead to a chain of transactional events that's noticeable. If repeated transactional behaviors are changed within the scope of permissibility, their transformative results on the economy can be unimaginable.

In order to break this down further, and in more relevant terms, let's address the most fundamental macroeconomic objective of any government: high employment.

High Employment

When either a consumer or a producer compromises on their end, it results in the other party benefiting. What matters here, is that the compromise and benefit is not symmetrical in any nature. This is because the compromises being talked about are immensely small on any scale, but the benefit that they collectively produce is asymmetrically higher.

For instance, if 100 individual consumers compromise each on their end relative to one individual producer, the benefit they bring to the producer might be enough to earn him/her employment. If the producer can hold the job, the economic stimulation that he/she provides far outweighs the sum of all compromises made by the consumer. This may not impact each one of the consumers individually at first. However, if multiple consumers initiate compromises on their end with a short range of time – the economic activity that it will likely result in certainly will.

This can be termed as the *CP compromise (The Consumer-Producer Compromise),* and it is not limited to one direction of altruistic behavior. When producers make compromises, the aggregate affordability of consumers goes up dramatically – resulting in willingness to spend in the economy, invest etc.

While not numerically concrete, the *CP* compromise can still be represented mathematically. Ultimately, its validity rests on the fact that synergy well and truly exists in altruistic economic behavior.

In order to derive *CP* numerically, we first identify all the relevant variables:

To describe the benefit of the compromise, it is best to use an inequality.

The following describes every symbol used in the equation:

Since the CP compromise goes both ways, we will identify a set of preliminary terms to be used for both:

A) Unitary Beneficiary – this represents either the sole consumer or the sole producer benefiting from the compromise
B) Collective Compromisers – represents the group of consumers or the group of producers willing to compromise

1) y = representing the total assets/wealth of the unitary beneficiary before making the compromise
2) y = representing the total assets/wealth of the collective compromisers before making the compromise
3) $\bar{x}$ = representing the total assets/wealth of the unitary beneficiary immediately after making the compromise
4) $\bar{y}$ = representing the total assets/wealth of the collective compromisers immediately after making the compromise
5) $\tilde{x}$ = representing the projected productive benefit to the economy as a direct result of the compromise (measured in GDP increase)

It is fairly obvious that the compromise can't be made each time – since synergy doesn't always exist. At times, the collection of compromised wealth might not lead to any productive output at all. Therefore, in order to validate whether or not a *CP* compromise should be made, we check the change in GDP as a direct result of the compromise to see if it outweighs the sum of all collective compromises made.

Therefore, the condition for the *CP* compromise becomes:

$x+y < \bar{x}+ \bar{y}+ \tilde{x}$

We can assign more telling terms to each variable, so

x becomes UB_1

y becomes CC_1

$\bar{x}$ becomes UB_2

$\bar{y}$ becomes CC_2

$\tilde{x}$ becomes PO *symbolizing productive output

This gives us the *CPC condition (the consumer-producer compromise condition)* that one can use to project the utility of a compromise:

$UB_1 + CC_1 < UB_2 + CC_2 + PO$

Individually, each variable can be modified as required by the numbers of the compromise. For instance, UB1 and UB2 might not be in terms of net worth or income, since they are multilateral variables affected constantly (by factors other than the compromise).

However, whatever unit or measure is used, if we predict that the productive output will outweigh the loss in the compromise, then we should make the compromise.

One might say that you could simplify this equation to whether or not PO exceeds 0, because $UB_1 + CC_1$ will always equal $UB_2 + CC_2$.

That, however, is not true, because the beneficiaries and compromisers do not have to split profit equally. For instance, a compromise can be made on a producer's end, but he/she might not share the full blunt of it.

Therefore we need to account for all four variables while making a calculation.

This concludes for us the derivation of our fourth equation of the set:

1) **Truthful Gain Advantage: the ratio describing the quantitative differences between any two payoffs on the basis of truthful gain.**

$$Tg\alpha|x \uparrow y| = \frac{Tg\ \frac{\mu \to \aleph(x)}{1+\sigma|\aleph(x)}}{Tg\ \frac{\mu \to \aleph(y)}{1+\sigma|\aleph(y)}}$$

2) **Aeque ratio: the ratio describing the quantitative competence of a pay structure in relation to its employee division.**

$$\boldsymbol{A}\frac{WCp}{\frac{\Delta R}{Qs}-\frac{\Delta C}{Qp}\ x\ WCw\ x\ Tw} : \frac{BCp}{\frac{\Delta R}{Qs}-\frac{\Delta C}{Qp}\ x\ BCw\ x\ Tw}$$

3) **Transactional Potential: the tendency of a clearly defined group to make economic transactions.**

$$TpG\ \frac{c\times s\times p\times t}{R} = |\{Tpg\ \frac{c\times s\times p\times t}{R} + Tpg\ \frac{c\times s\times p\times t}{R}\}|\ TpP$$

4) **The CPC condition (the consumer-producer compromise condition) that one can use to project the utility of a compromise. Should this condition be satisfied, the compromise in question should be made.**

$$UB_1 + CC_1 < UB_2 + CC_2 + PO$$

Re-defining rationality:

In order to successfully solve any economic inefficiency, one needs to define the state of economic optimality with relative consensus. For instance, what does it mean to be rational? Information failure, for instance, is defined as a collective market failure resulting from asymmetrically information distribution, which in turn leads to consumers and producers making irrational decisions. However, this definition is vague and not of utility if one can't address what rational really means.

In conjecture, it can be fairly asserted that human beings are inclined to make decisions that are rational for themselves in any given circumstance (for instance – saving money through bargaining a purchase, and deciding whether to buy or sell at the right time). However, this definition of rationality isn't representative of the ideal economy at all.

This is because of one fundamental reason: **everyone's choices can't be rational at the same time and succeed.** While economics may not be a zero-sum game, financial decision making certainly is. As a result, any decision can be more or less derived to be of one of two different rationalities, if rational at all:

1) **Selfish/Financial Rationality**: This is the most common, and in today's economy, the most functional type of rational decision making. The decisions under this division of rationality originate from a projection of self-interest, where the decision maker is looking out for himself/herself in the short, and sometimes long term.

2) **Economic Rationality**: This type of rationality is the rational decision making that most economies would benefit greatly from. Economic rationality is rationality in not financial, but economic terms. Any decision (eg: a compromise, decision to bargain, purchase, sale etc.) that benefits the economy in the long term (long term being more than a few days) can be said to be economically rational.

Most individuals, organizations and firms think in terms of financial literature – making and maintaining the flow of money. And in countries that are not ruthlessly capitalistic – that system works well. It creates wealth, creates employment, and increases affordability for some groups. However, it can be made drastically better by understanding one basic principle: *The Economy isn't based on money, or on wealth. In its purest form, the economy is run by decisional standards and payoffs.* These payoffs may or may not be in the form of money, but money, in and of itself, does not run the economy.

What runs the economy is the payoffs, back and forth, money or not, between players (consumers, producers, governments etc.). There's a fundamental difference between these two ways of thinking.

When you think about the economy purely in terms of money, you are in fact creating a symmetrical limitation to how one decides to make decisions. In terms of money, someone's utility will always be someone's loss. And that might be applicable in running a business, but it certainly isn't applicable in running an economy.

Running an economy efficiently requires acknowledging the fact that payoffs are not the same thing as money, and that their benefit can't be quantitatively measured. A job offer is an example of a payoff, while the money it brings you is an example of income. The difference is payoffs can be asymmetrical, and they usually aren't zero sum.

As previously discussed, using the *CP* compromise, a group of individuals can create economic synergy through altruistic decision making. Each individual compromise doesn't affect the compromiser too much at all, but the sum of their benefits has the potential to change the life of unitary beneficiary.

In order to further decode this, we need to address why an economic system like capitalism creates wealth in the first place.

Capitalism, which is based on the notion of free markets, creates wealth through competitive growth. When everyone makes decisions for their own good, the overall outcome tends to be better for everyone. However, if

practiced without limitation, it can create monopolies and unfair practices that are left unchecked.

If maintaining free markets is the only thing that one has to do while creating economic synergy, then all one really has to do is change how people think. And changing how people think, even millions, is not something remotely impossible. It's been done countless times before, and it can certainly be done again.

In order to revolutionize consumer and producer decision making, the most fundamental element to the discussion has to be that of behavioral economics. While we've relentlessly studied how everyone makes decisions, nobody has really tried to change how we make decisions on a noticeably large scale.

If one were to do that, experimentally or empirically, its results would tell us one of two things:

Either, economic synergy exists and altruistic behavior in the short term pays off for the economy in the long term. In this case, the world could rapidly progress towards economic betterment.

If this is not the case, at least we'll know the answer to another fundamental question: that there is a much harder way out of the biological thinking mechanisms that we have been confined to.

Either way, it'll be better than the status and range of our current knowledge on the economy.

Chapter 7: Is it worth it?

In order to truly invest one's effort into it, a certain sense of assurance, if not certainty, is required in the matter. Is it even worth it? This isn't something one can label a cost-benefit analysis with, as it's not a financial proposal at all; it's an economic proposal with financial consequences. There is no way of knowing for sure if it can succeed, but one can certainly assess its worthiness in terms of a potential attempt.

In all probability, quantifying a risk assessment of economic synergy isn't feasible, because there are way too many continuous variables involved. Therefore, one has to identify a list of pros and cons, and then observe how and if they neutralize one another.

There are a number of risks that can be associated with economic synergy. They include, but are not limited to:

1) **Short term losses for players**: this is the most obvious consequence of a failed attempt at economic synergy. Unless experimentally proven, there is no assurance that a wide-scale attempt to make compromises and deviate from traditional rationality will result in economic growth Should it not, players will lose short-term (which is something that could be particularly be devastating for those simply can't afford to lose).

   More importantly, this loss might precede an age of financial mistrust.

2) **Breaking Supply and Demand**: if firms, consumers and producers all begin to behave differently, and with respect to different SDE (Supply Demand Equilibrium) curves, there might be nothing whatsoever that guarantees the final outcome will be ideal.

3) **Disrupting the Price Mechanism**: at the heart of capitalistic economies is the price mechanism, which is something whose very consumeristic core could be cleaned out with a single instance of economic synergy for a given industry.

As of today, we've collated our efforts into building the financial sector (investment banks, lenders, borrowers, rating agencies etc.). If we could somehow find the resources to do the same for building a strong economy, whether or not we'd get there won't be the question anymore. The question will become that of when we get there.

Philosophical Economics

The entire model of compromise between any two parties for the supposed greater good, is fundamentally based on the idea that life, as an abstraction, is not zero-sum. There are multiple ways this can be reinstated, modelled or proven, but 3 primary ways are as follows:

1) Understanding that zero-sum games are sadistic in nature
2) Mutual Evolution
3) Determinism

As far as zero sum games go, they have one crucial attribute – utility equals loss. In specific terms, the aggregate utilities in the payoffs are cancelled out by the aggregate losses. This outcome takes place because in any zero-sum game, utility **causes, or necessitates equivalent loss (which is a trait that can easily be termed as sadistic).**

The capitalistic attitude reinstates that winning at all costs is necessary, but when you put it into material terms, it's almost frightening how ethically flawed it becomes. A functioning human heart, even though it might not feel for others as much, couldn't possibly celebrate a victory if it comes at a great loss to someone else.

However, in real life economics, these effects aren't as exaggerated, so we don't pay attention to them. For instance, nobody stops to consider the costs at which their own utility comes at, because they simply aren't visible in their immediate surroundings. Moreover, when utilities and/or losses are shared, no one individual suffers greatly (eg: winning a lottery). However, these markers by no means eliminate the sadistic tendencies of a zero sum gain.

It is of utmost importance to also take into consideration that most real life circumstances are inherently not zero sum, but are perceived to be (because of intrinsic human nature). For instance, a survival game.

When considering a survival game, most would agree that it would be a mistake to compare the payoffs of only two players or individuals. Measuring

the ability to survive requires a large sample size (for instance: a predator-prey relationship).

For the sake of experimental simplicity, let's assume a survival game between Predator X and Prey Y. For any one pair of the two, the zero-sum attribute is clearly observable. The predator wins at the cost of its prey, and vice versa. However, when discussing the nature of both species over a significantly longer timeline – the zero sum trait vanishes. This is because both **even though selfish interests are mutually compromising, they result in mutual evolution if repeated over millions of iterations.** Both species tend to evolve consistently, in order to adapt to one another – resulting in a **positive sum** outcome. If you compare a random pair of the two at any one point in time, with a random pair of the two several generations later – you will observe a **positive sum difference.**

Mutual evolution, or devolution, like the concepts mentioned above, can also be modelled mathematically, in terms of **positive/negative sum** – where the positive sum of any two competing, non-cooperative groups A v B over time T, equals the individual change of each divided by the number of generations in between.

In the equation below, the following notations apply:

$A_{1:}$ The competence of a random player selected from group A from an inferior point in time.

$B_{1:}$ The competence of a random player selected from group B from an inferior point in time.

$A_{2:}$ The competence of a random player selected from group A from a superior point in time.

$B_{2:}$ The competence of a random player selected from group B from a superior point in time.

G: number of generations in between the random pair selections

$P_{s:}$ Positive Sum (can also have a negative value; in which case it becomes a negative sum).

$$Ps = \frac{(A2\ -A1) +\ (B2\ -\ B1)}{G}$$

The larger the change/timeline ratio gets, the greater the positive or negative sum of the game becomes. The 5th equation completes the set of financially motivated economic behavior:

1) **Truthful Gain Advantage: the ratio describing the quantitative differences between any two payoffs on the basis of truthful gain.**

$$Tg\alpha|x \uparrow y| = \frac{Tg\ \frac{\mu \to \aleph(x)}{1+\sigma|\aleph(x)}}{Tg\ \frac{\mu \to \aleph(y)}{1+\sigma|\aleph(y)}}$$

2) **Aeque ratio: the ratio describing the quantitative competence of a pay structure in relation to its employee division.**

$$\boldsymbol{A}\frac{WCp}{\frac{\Delta R}{Qs}-\frac{\Delta C}{Qp}\ x\ WCw\ x\ Tw} : \frac{BCp}{\frac{\Delta R}{Qs}-\frac{\Delta C}{Qp}\ x\ BCw\ x\ Tw}$$

3) **Transactional Potential: the tendency of a clearly defined group to make economic transactions.**

$$TpG\ \frac{c\times s\times p\times t}{R} = |\ \{\ Tpg\ \frac{c\times s\times p\times t}{R} + Tpg\ \frac{c\times s\times p\times t}{R}\ \}\ |\ TpP$$

4) **The CPC condition (the consumer-producer compromise condition) that one can use to project the utility of a compromise. Should this condition be satisfied, the compromise in question should be made.**

$$UB_1 + CC_1 < UB_2 + CC_2 + PO$$

5) **Mutual Evolution: the formula defining the positive or negative sum of a long term game:**

$$Ps = \frac{(A2\ -A1) +\ (B2\ -\ B1)}{G}$$

PART 2 – Intrinsic Economics

Chapter 8: Power Structures

In order to maneuver real life games (positive, negative or zero-sum), it is absolutely crucial to grasp the role of power structures. Power structures define the organization of institutional power amongst a group of usually non-cooperative players.

Power structures always have been, are, and will continue to be competitive by nature. This is good for the economy, because it's what drives any kind of decision making in the first place. However, maneuvers such as the CPC (consumer-producer compromise), or the welfare contract compromise power structures at one level or the other.

In order to fix this, by counterbalancing or any other method, one must first reiterate what power is in the first place.

The definition of power changes from a single player to a group. For any one player, the competitive market is the summation of all other individual players in the game. Therefore, power is defined as leverage over every one of those individuals. A group, however, competes both internally and externally. Power for a single group can be defined as competitive leverage over other non-cooperating groups. However, the power structure within any one group isn't fixed either (example: a firm). A firm, for example, undergoes internal transformation over time. This transformation in terms of power is determined by what change best suits its external competitiveness. For example, partners within a firm are recruited, changed, or let go based on which combinations best serve the firm as a whole, in relation to the market in which it operates.

In summary of the above, we can therefore conclude that there are two primary types of power structures:

A) **Internal Power Structures**: An IPS can be defined as the power structure within a single player (a player that can be an individual, group or a firm).

B) **External Power Structure**: An external power structure can be defined as the distribution of power in an economy among individual players

Neither internal nor external power structures stay static over time. In fact, a key indicator of a healthy and booming economy is how dynamic its power structures are. The more stimulated an economy, the more its tendency to undergo changes in power (both internally and externally).

Power in an economy isn't defined by wealth or money. Instead, it is defined by leverage, or the influence of a single player on the economy. This influence may or may not be caused by money itself. It can have political or social roots too.

For example, an individual with a political foothold may not be worth as much as a partner in a well-known firm, but will have the backing of a federal reserve in making decisions. The best way to put forth this idea is as follows.

There are few things in this world that money can't buy, but power is one of them.

The Fault in Power Structures

Power structures in the modern world are far too univalent. It may be cliché, but inherited wealth plays far too big a role in shaping power structures. Meritocracy, a far-reaching promise of capitalism, is a thing of the past.

In order for the economy to be 'fairer', and perhaps even stronger, power structures need to be made dynamic. Unless the range of financial competitiveness is increased to cover much more of the population than it does today, the economy will continue to be vulnerable to recessions and bubbles.

Understanding power structures is the only true way of understanding the economy. This is because in an economy, money talks, but power is what runs the show.

Don't be mistaken – creating the perfect market by no means involves tearing down the power structures we have today. It simply means questioning their authenticity, and then using civilized ways of changing them for the better.

The ideal internal and external power structures are likely to have the 2 following traits:

1) **Consistent Dynamism**: Dynamism in positions of power is the only way economic growth can take place. This is likely to take place via raising standards and raising the stakes.

2) **Pareto Optimality:** In order to optimize power (perhaps even in terms of truthful gain), one has to treat power like any other resource. There's a limited amount of it – so the best way to negotiate is to try and attain a state of Pareto optimality (where re-allocation is not possible without some amount of compromise).

Since there is a limited amount of power, but an unlimited thirst for it, it's fair to assume that we find ourselves in a state of *power scarcity*.

As a fact of nature, whether it be for evolutionary or economic purposes, individual players and groups are consistently fighting for not only survival, but also **power.** While survival can still take place on a large scale relative to the competing group, power is something that can only be held by a small percentage of players. Therefore, the threat to a player's potential of being in power is much greater than the threat to a player's prospects of survival.

However, power is something that comes later in the chronological sequence of needs for the average player. For some, it can even be classified as a 'want'. Survival, on the other hand, is the most basic need for any player. The prospect of power therefore comes considerably after survival has been successfully accomplished (which is why it isn't talked about as much).

The thing about power structures is that when it comes to changing them, it only takes a singular nudge to alter one's course. Likewise to transactions, power structures are often subject to chaos theory, where a unitary decision can have exaggerated effect on the entire game.

This is because in order for any power structure to function, there is often a **hierarchy of action**: where any one player is usually acting in a certain way with respect to the demands or needs of a higher hierarchy. The most common example would be an individual working a firm, with the incentive of a salary. The actions of the individual are subject to supervision and demands from a hierarchical authority above him/her. The individual acts in a certain way because the hierarchy above has **leverage** over him/her (in this case: the right to terminate employment, or give a raise).

For the sake of simplicity in demonstration, let's assume an example of an underpaid employee.

As previously discussed, any individual would traditionally act in respect to his/her selfish interests. Even if he or she happens to be underpaid, it is a better alternative to being unemployed. If a single individual is let go by the firm, it's the individual that takes the loss. Therefore, he/she sticks to the firm despite being underpaid.

This is where the exaggerative element of power structures comes in. If we assume more than one underpaid employee – say ten, or fifteen; all of them share a common goal. If one individual makes the decision to leave the firm, it could set off a chain reaction. All it takes is for one player to defy a power structure, and other unhappy players tend to follow too. This may be either because they feel more confident in doing so (given at least one other person now bears the same risk as them), or because they see a promising opportunity elsewhere. Either way, the power structure that was in place has been compromised.

When power structures remain dormant and rigid for too long, they create a stagnant effect on the economy. The ideal economy is one whose constituent power structures keep alternating and changing over time. If they don't, the market competitiveness is likely to slowly decrease over time.

Breaking a Power Structure

For any one individual to attempt to break a power structure, he/she has to have a definitive incentive in terms of risk and reward. When one's own source of income is at stake, for example, the subsequent reward has to be significant (for instance, a job at a competing firm).

This complication is added to by the fact that successful attempts to break a power structure only take place when multiple player contributions are involved. It is impossible for a single individual to break the power structure at a firm by simply leaving, because the aggregate distribution of financial leverage is more or less the same. It takes the loss of 7 or 8 competent individuals for a firm to realize its mistake in full, and either correct it or suffer the consequences.

And as with most economic games whose outcomes rely on more than one decision, an attempt to break a power structure is subject to a state of **nash equilibrium.**

If two underpaid workers collectively decide to leave a firm, and one betrays the other by not leaving, the betrayer might get promoted to a higher title (because of the new vacancy) resulting in higher pay; while the one who left will find himself or herself unemployed.

As a result of this, power structures are very rarely broken. When anything requires collective decision making with the possibility of betrayal, very few individuals are actually willing to take the risk and attempt to cooperate. Part of the reason for this is because human beings are inherently wired to think short term (eg: preferring a $50,000 a year job now over taking a chance at a $250,000 a year job in two years). This can be credited to a **risk aversion mentality**.

Risk aversion is effectively a side-effect of human psychology that results in players making decisions on the basis of certainty, even if it means a lower expected payoff as compared to another alternative.

The truth about risk averse individuals is that they almost always seem to avoid failure, but are rarely ever successful either. The one thing that people

seem to ignore while making risk averse decisions is that unlike other resources, time is sufficiently finite. And no matter who or where you are (unless you're an elderly individual), you almost always have enough time to turn around your life. People, however, have a hard time accepting that, which is why they prefer being risk averse, safe, and are generally satisfied by 'sufficient' rather than 'significant'.

This, of course, is a normative trait – not a universal one. In fact, the most successful economic players are those who are willing to take calculated, but also instinctive risks that separate them from everyone else.

Risk aversion, from an economic standpoint, credits this to the simple, intrinsic human preference of certainty. While preferring certainty seems rational at first, it is anything but in the long term. In order to truly be successful (in the top 1 percentile), one has to compromise certainty at some level. When it comes to economic decisions, certainty doesn't actually exist. Nobody can truly predict human behavior to a degree that is 100% accurate, and it is therefore impossible to generate significant returns without taking a leap of faith, even if it happens to be a small one.

In summary, power structures can only be broken if risk aversion, as a concept, is ignored by the individuals attempting to break it. As has been reinstated, a single uncertain risk has the potential to break an entire power structure with certainty.

Chapter 9: Price's Law and The Efficiency Thesis

One of the most frontal and vital elements of a strong economy is its ability to delegate and distribute work efficiently (ie. Productivity). Most people acknowledge the importance of productivity in micreconomic settings (eg: stakeholders and executives of small firms). The problem, however, lies in that the majority of them overlook productivity as a key determinant of long term economic output. For the sake of simplicity, one can primarily use the following four dynamic variables to determine long term macroeconomic output (sales and revenue);

Number of Workers/Employees

Wage Rates

Prices

Productivity per worker

Three of the above are subject to natural, expected changes because of market forces and long-run socioeconomic phenomena such as inflation. Therefore while it may be possible to manipulate either one in the short term to boost economic output, one needs a more permanent, universal solution.

The fourth one is a variable that can be propagated to a high quantitative value and maintained/kept there for significant periods of time. Simply streamlining recruitment processes and inefficiencies s at specific stages of production is nowhere near effective enough.

This is where Price's law comes in. Being an information scientist, Price discovered that in most systems of employment involving some form of productive output, approximately speaking, the square root of the number of people in the productive domain who were the most productive produced half of the productive output. So in a domain of 400 employees, the 20 most productive people are more than likely to produce half of the domain's work.

The psychology and human behavior behind the manifestation of Price's law is still yet to be understood in a concrete manner, but what this tells us that the functionality and efficiency of individuals in a competitive domain is far from being symmetrical, and if nothing else, shows conformity to Pareto optimality.

A Pareto distribution is a well-known standard of socioeconomic divide that describes the distribution of welfare amongst productive populations. In most industries, markets and societies, 80% of the wealth, resources and capital that the community has to offer is owned by or close to only 20% of the number of people in the class who could theoretically own them.

If one were to match this with a productivity-based reward system in most domains of dynamic employment, then a similar figure could be yielded.

For instance, most law and consulting firms in modern white collar industries (especially those that prioritize revenue instead of public benefit) reward their employees meritocratically – with the most conscientious, hard-working individuals receiving correspondingly generous bonuses that reflect the quantity and quality of their work. Since most of these firms constitute normative productive domains, they are subject to Price's law. And in fact, upon closer observation, 80% of the firm's revenue is often drawn and kept by 20% or so of the firm's employees (usually the most senior and experienced partners and executives).

One question that hasn't been addressed by information science similar to and resembling Price's law, is whether or not it propagates through different arrangements and generations of productive domains. To visualize, if one were to assemble a group of 16 people randomly and give them a cooperatively collective task, it will more or less be expected for the 4 most productive people to complete close to half the total domain's work. But let's assume, for instance that there were 4 such domains, totaling 64 participants.

What would happen if the 4 most productive people from each domain (let's refer to them as the productive class) were to be identified and separated from their groups, only to be placed together in a different group? It is obvious that this group will be far more productive than the previous ones, but the question that arises is that of whether the workers of the productive domain will obey or conform to Price's law. It may seem straightforward at first, but it is anything but.

In order to effectively analogize the functionality of Price's law, one must assign a mathematical dimension to its applications.

In doing so, it might become a lot easier to model some of its effects into the real world in a manner that is both practically, experimentally and empirically acceptable.

To start off, we know that there are primarily three parental factors with which the productivity of a domain can be derived;

Number of Workers/Employees; Nx

Productivity per worker P_{Nx}

Aggregate Productivity A^{P}_{Nx}

Using the former three variables one can define the total productivity of a particular employment domain.

Step 1; it is easily inferable that the aggregate productivity of a domain equals the average productivity of each individual worker times the total number of productive workers accounting for that average.

So $\mathbf{A^{P}_{Nx} = P_{Nx} * Nx}$

However, the mean productivity of each worker is itself a multivariant quantity that is dependent on numerous factors. In fact, the very purpose of modelling an optimization equation related to aggregate productivity is to demonstrate the different ways in which one can alter a worker's mean productivity to change the former.

At the same time, almost every firm runs on a salary/employment budget and does not possess and infinite number of financial and material resources to incentivize workers with. Therefore, in order to raise their wages to just the right amount, so as to maximize productivity and maintain productivity, it is imperative to understand this.

Consequentially, the average productivity of each worker $\mathbf{P_{Nx}}$ can be further described to be a quantity compromising 4 variables.

Median Wage W_M

Wage Incentivisation Coefficient: P_{Wx}

Total Wage Raise: W_X

Wage Raise per worker W^{N}_{X}

Surplus budget/resources available for wage raise; B_x

The median wage is the wage at status quo – ie. Current wage offered to a series of workers. The total wage raise is the idyllic quantity by which the total operating budget for salaries and stipends should be increased in order to maximize productivity and increase profits, and the surplus budget refers to the total available monetary buffer for doing so.

The wage incentivisation coefficient connotes the expected per unit increase in a worker's productivity as a motivated response to a unitary increase in his/her wage.

It is also fairly clear that the allocated budget should be exhausted, so as to provide a saturated increase in total productivity.

So, in other words,

$PNx = W_M + (P_{Wx} * W^N_X)$

Where:

$W^N_X = B_x$

Combining this finding with the first derivation, we get our first theoretical equation;

$A^P_{Nx} = [W_M + (P_{Wx} * W^N_X)] * Nx$

Needless to say, conjectural estimations like the one above give rise to a host of unanswered questions and uncertainties. For instance, it is practically daunting to assess the rate or sensitivity with which workers respond to a wage raise; especially so given the uniqueness of each industry and volatility of markets all around. And it is this volatility and unpredictability of demand and economic potential that makes it ever more difficult for firms to raise wages without a guaranteed degree of reliability and faith that such a change will succeed in recovering profits. It's also contributed to by the fact that human productivity is strongly intrinsic in the way that it acts. Being overtly reductionist and narrowing productivity down to a causal concept that is unidimensionally linked to financial reward is a mistake that no capitalistic entity would make in their wildest nightmares. And this is where the psychology of the human mind becomes increasingly important in defining boundaries of productivity.

There are two ways in which one can treat individual efficiency. The first one, demonstrated in the equation above is by modelling it to be a dependent variable that is reliant and changeable on an on-demand basis. The second one, is the more open acceptance of it being a dynamic variable that can be influenced, but not predictively and consistently alterable. In other words, there are inevitably a number psychological elements contributing to productivity that we cannot either observe, or experimentally test. It is this lack of empiricism and functional vacuum that causes many to question whether or not human efficiency is a penetrable science. Since psyches and personalities differ by person, it is very difficult, if not impossible for a stakeholder to identify and stratify executive regimes for individual employees to add to their aggregate productivity.

Nevertheless, this issue is not one that can't be circumvented. While the intricate processes that govern human productivity can't be studied in reasonable measure, the observable effects they have in macroeconomic systems can still be adjusted through trial and error. For example, constructing groups using the most productive batches of individuals in different domains does considerably more than additively benefit the aggregate productivity of the new domain; it pits some of the most fiercely competitive workers against one another and encourages their work ethic to, over a period of time, spread out in an asymmetric manner via the playing out of Price's law. When this takes place the least productive workers of the new domain tend to exhibit an unchanged mode of productivity, but those that compete and win in a Darwinist environment manage to have unlocked an entire new gear of efficiency.

By activating an entirely unknown dimension to their work, the stakeholder might then manage to not only increase his/her domain's overall productivity, but its **net output of work** too.

Chapter 10: Matching Productivity Cycles with the Business Cycle

It is well known that most economies operate sporadically as integrants to normative business cycles, wherein full and total employment is actualized

across predictable intervals. In other words, economic activity is rarely ever constant, but nonetheless exhibits a structural periodicity in its dynamism. One can predict peaks, crests, recessions and recovery periods with margins of error close to anywhere from 5 to 10 percent. This slight uncertainty, still, can, on an absolute scale, constitute billions of dollars' worth of transactions and entire months lost and their subsequent productivity. While this is, of course, challenging to the say the least, matching the cyclical movement of human productivity diagrammatically with corresponding economic activity may perhaps either reduce, or increase the damages caused to middle class populations over an iteration of low financial success.

In microeconomic settings (ie. When individual firms or markets are concerned), multiple metrics or scales can be utilized to determine labor productivity. On an aggregate degree however, the most widely accepted method of calculating labor productivity happens to be by dividing an economy's real GDP by its total number hours spent in production.

Needless to say, this means that labor productivity, in terms of its modern day definition rises and falls with economic activity (or the other way around).

Thinking about productivity in this capacity, however, is limiting. This is because it axiomatically submitting to the fact that productivity, like the economy, is subject to natural, intrinsic unavoidable changes and fluctuations that hinder any intended linear growth. If one were to not make this assumption, or at least attempt to work otherwise, that would open up a world of possibilities. For instance, influencing and propelling human productivity is key to boosting economic activity. If economic success really is a derivative of how efficiently human beings can function (irrespective of industries, markets, or sectors), then surely the only tenable solution to empowering economies is to provide them with the most productive, sustainable and durable populations of working class individuals. In fact, this is precisely why developed countries (such as Scandinavian ones) where socioeconomic success is sky high, are noticeably constituted by majority populations that holds steady jobs and incomes, with above-world-average productivity. This is also enables them to pursue secondary, specialized

career prospects later in life (because they avail financial security), further increasing economic returns and stimulating a greater number of transactions.

Enhanced industrial development also reduces the need for cut-throat competitiveness, because real scarcity is low, affordability is high and welfare is strong. Therefore, most people can sustain an affluent, wealthy and comfortable lifestyle, as well as afford to pay for their children's tuition (if that's a requirement at all) without denting their savings. They may not be millionaires, but they most certainly don't have financial troubles on a daily basis, and rarely experience them in the first place.

Productivity, of course is a subjective, opinionated, psychological construct. It is a resultant quality of one's behavior, and it is very difficult to standardize or model under any agreed-upon/universal metric. Due to this fact, associating and correlating changes in productivity with changes in economic outcomes is a slippery slope, and a grey, uncertain area of academic exploration. It is one that requires plentiful research, psychometric analysis and further insight and understanding into the fundamental determinants of efficiency, including the most rudimentary elements of human physique and mental health.

Chapter 12: Collective Adaptability

One of the most pivotal elements in redefining economic transactions and revamping financial markets is assessing whether or not there exists a potential for collective adaptability in the long run. Most people possess varying degrees of personal and impersonal flexibility on monetary fronts but perfectly rationalistic economies demand nothing short of perfectly rational decision making, in all industries and markets, all the time. While this is theoretically achievable, it is of course a far-fetched dream. While egalitarian economies can approach this state with asymptotic accuracy, fulfilling it is near impossible. Regardless, there are a number of different barriers and obstacles that need to be overcome far before a large enough attempt at realizing the perfect market takes place.

In any regional institution that is generative and financially motivated, there are a number of hindrances that constitute a counter-cyclical resistance to the

profitability of the company. They may or may not be noticeable, but their presence is of large enough importance to warrant analysis and in the future, reform to reduce their effect.

A) *Naturalistic attrition*; over a period of time, non-appreciative productive assets to an economy (both people and capital) erode. While they are often replaced, renovated or repaired, their gradual rate of decay expected depreciation is always an overarching concern in their potential yield and vitality to their employment domain. Workers and employees age and grow more fragile, weaker and become needy medically and fiscally, machinery and equipment breaks and diminishes in quality etc. Entities that are indebted to these institutions, or carry a pension burden through a contractual agreement also create financial resistance to their generative power over time. Healthcare, insurance, and all other contingent liabilities are included in the above dissertation.

B) *Expected Dilution of Market Share*; similarly, likewise to administrative complications, most firms in competitive, capitalistic environments tend to encounter more and more competitors in the long run (because of new entrants and incentivized production). Therefore, while revenue may increase, real market share, and its derivative – relative profits may fall substantially purely as a result of an inevitable growth in market competitiveness.

C) *Isolated Incidents with Unwanted Ramifications;* One-time, unforeseeable/unpredictable extrinsic incidents/accidents or natural disasters of public, communal or internal nature that are heavily taxing on an institution's ability to break even, raise capital, make acquisitions or register profits for a specific period of time characterized by the aftermath of the event.

While the first two are certainly avoidable (statistically), and perhaps through inferential mathematical intervention, unforeseeable ordeals, as

are in the name, are extremely difficult to pre-empt. This is because they are completely independent of predictable movements and shifts in activity that are cyclical, and are instead completely random and wayward in the way that they unfold.

As previously discussed, the empirical success can solely be measured using its power to generate high levels of income across an inclusive strata of its inhabitants. It doesn't have to be perfectly egalitarian to satisfy this objective, but nonetheless needs to alienate monetizability from the top one or two percent of extremely wealthy and powerful individuals. Value, leverage and stimulation should, idyllically, originate from all socioeconomic classes, regardless of their power to draw in income. This econometric concept, however, is seldom reflected in today's economies. Languid and inactive populations who have not yet reached the median age of retirement that either live off welfare/social security or are dependent on an financially stable member of their family/or a blood relative are the most defining reasons for why developed economies tend to reach stagnation after a certain point in time. Socioeconomic ambition is halted because of expedient living that is neither productively motivated nor financially beneficial.

As a direct consequence, it can't possibly be emphasized how important rational inclusivity, meritocratic hierarchies of dominance and cooperative synergy are in the development of the perfect market.

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