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Informal Institutions, Stars and Increasing Returns

We are just an advanced breed of monkeys on a minor planet of a very average star. But we can understand the Universe. That makes us something very special.

— Stephen Hawking

I. Introduction.

A shared characteristic among economists is the need to make assumptions about the world in order to simplify their models and be able to draw certain conclusions from them. It is a tradeoff economists must make between realism and simplicity, and most of the time they are led to the latter. One of the sacrifices that have been made out of necessity is the institutional environment where individuals transact and make decisions.

The purpose of this paper is to understand how this institutional environment—which most economists take as given—actually functions. As will be shown, institutions have a certain characteristic that makes them more dynamical than has been noted, namely, that institutions have increasing returns. Individuals live in a world that has rules and conventions that influence their decisions, and sometimes these various "rules of the game" compete with each other.

This paper will not follow the typical economic methodology of optimization and static equilibrium analysis, but it will instead use a simpler and more intuitive style, an analogy. This tool will allow us to use a comparative analysis to highlight and understand how increasing returns affects the dynamics of institutions. Using an analogy has its setbacks, and one in particular is when the analogy is taken too far. The literary figure is used only as means of explanation and to facilitate understanding, and at no point should it be interpreted that stars and individuals act alike.

The structure of the paper is as follows. Section II will explain what institutions are, and how contemporary economists have dealt with them. Section III will introduce a specific kind of increasing return that has been found in technology research: network externalities. Section IV will apply the concepts in section III to informal institutions, followed by a simple model for understanding its effects in section V. The astronomical analogy will be used in section VI to see some examples of the model in the previous section, followed by the concluding remarks in section VII.

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II. Institutions, Formal and Informal.

"Institutions matter" is a phrase that has been recently expressed by many economists, and it is the reason why so much research has been done lately in this field. The study of institutions has existed for centuries, but only recently has it been incorporated into the field of economics (the New Institutional Economics, NIE). But what are institutions? This is a question those same economists have been asking themselves. There are several definitions, though this paper will follow the lines of two economists in the semantics of institutions: Douglass North and Samuel Bowles. According to North, "Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)."[1] Bowles says, "Institutions are the laws, informal rules, and conventions that form a durable structure to social interactions among the members of a population … Institutions influence who meets whom, to do what tasks, with what possible courses of action, and with what consequences of actions jointly taken."[2]

Although both definitions differ in some aspects, they give an insight into what constitutes an institution. These social mechanisms inform, assign and coordinate individuals in repeated social interactions. "Institutions" is a broad term, so it is of great importance to distinguish what kind of institutions exist in order to understand their independent effect on individuals. Oliver Williamson has done a good job in identifying them. He separates them in four levels, which correspond to a different area of study. The figure on the following page (from Williamson, 2000) illustrates the different levels, the frequency (the amount of years needed for radical change of institutions), and the purpose of the institution.[3]

Most economic studies are focused in the L4 institutions, and have recently moved to L3 and L2. Studies of L1 institutions have been relatively few, but there has been interesting research in this area, which will be mentioned throughout the paper. Williamson said, "An identification and explication of the *mechanisms* through which informal institutions arise and are maintained would especially help to understand the slow change in Level 1 institutions."[4] That is the purpose of this paper, to understand the functioning of informal institutions. With the help of current research in technology, and an analogy with the formations of stars, I attempt to give an insight on how Level 1 institutions are formed, on how they grow, and how they may disappear. An example of informal institutions is crucial for the understanding of the ideas presented in this paper.

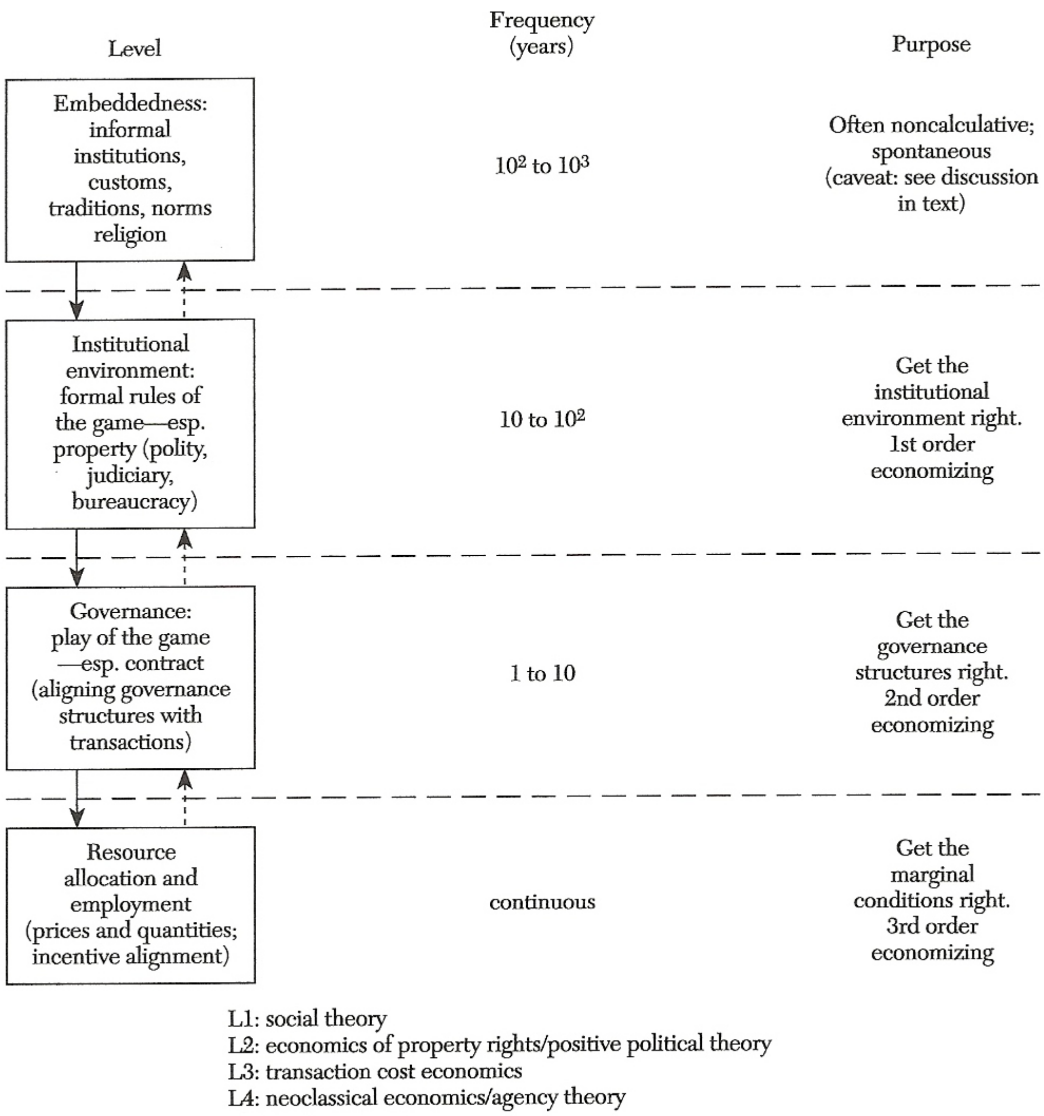
Long distance trading was a complex business in the past. During Roman times for example, when merchants imported grains, they faced a big problem, uncer–

[1]Douglass C. North, "Institutions," *Journal of Economic Perspectives*, 5 (Winter 1991), p. 97.

[2]Samuel Bowles, *Microeconomics: Behavior, Institutions and Evolution* (Princeton University Press, 2006), pp. 47-48.

[3]Oliver E. Williamson, "The New Institutional Economics: Taking Stock, Looking Ahead," *Journal of Economic Literature*, 38 (Sept 2000), p. 597.

[4]*Ibid*.



tainty. They had to purchase grains from far lands, from people who they did not know and never would, wait for a boat that carried their goods, with no information of their whereabouts, and hope that the amount and quality of the grains were what they expected. These problems are still faced today, but in a lesser degree due to technology advances such as the Internet and satellites, but to the Roman merchant these were problems big enough to stop importing. Merchants tried to face these problems through various means, including trading with family only. But the demand for grains grew to the point where they needed to deal with strangers. An informal institution was developed, the endorsement of a merchant by a knight or senator. If a senator were satisfied with the results from the merchant, he would endorse him and even recommend him to other businessmen.

For this to work, the merchant had to be sure that other senators would accept another senator's endorsement, and that other merchants would be competing for a senator's endorsement. The bigger the network of senators and merchants that accepted the endorsement mechanism, the greater assurance the marginal merchant would have over the acceptance of his endorsement. The more people were part of the institution, the more attractive it would be to an outsider, and when an additional outsider joined the network, the attractiveness of the institution would grow even more. This means that informal institutions have increasing returns, something that has been pointed out by many economists, including North and Bowles. But why do they have increasing returns? What made the senator-endorsement mechanism in Rome have increasing marginal returns when an additional merchant got involved in the institution? To answer these questions, I turn to a helpful tool in understanding increasing returns in technology.

III. Technology and Network Externalities.

Robert Metcalfe, the creator of the Ethernet, was the person who first established the term "network externality." Metcalfe believed that the value of a network depends on the number of users in it. The more people used a certain network, the more possible connections existed between individuals, which increases its value. For example, if only three people used the telephone for communication, there would only be six possible connections, but if there were four people using the telephone, there would be twelve possible connections. Therefore the value of the telephone network is proportional to the number of nodes made possible by the number of phone users. Let M be the value of a network in a Metcalfean way, we then have:

$$\begin{aligned} &M_i \equiv f(n_i) \\ &f(n_i) = n_i(n_i - 1) \end{aligned} \tag{1}$$

where n_i is the number of the users in the network i, and is therefore restricted to positive values. As we can see, $f(n_i)$ is positively correlated with n_i, which means than the value of the network is increasing with the amount of users. Now consider the sensitivity of the value of the network i (M_i) to a change in the amount of its users.

Taking the first and second order derivatives we get:

$$\begin{aligned} &\frac{dM_i}{dn_i} = 2n_i - 1 \\ &\frac{d^2M_i}{dn_i^2} = 2 \end{aligned} \tag{1.1}$$

The first order derivative is always positive. The second order derivative is always positive at any given n_i, which means $f(n_i)$ is a convex function. We can now see there is a marginal increasing network value with an increase in the number of its users. This is the main point in Metcalfe's idea of the value of a network; not only is the value of a network a direct and positively correlated function of the number of users, but it is marginally increasing. This is what is called the Metcalfe Law.

Consider now how network externalities, explained by the Metcalfe Law, work in an institution, for example the institution of money, and in this case gold. This institution provides a means of exchange between numerous individuals. The value of gold as a means of exchange depends on the number of people who use gold for this purpose. If there are only ten people using gold, there would be 90 nodes, which are 90 different potential ways of exchange between the group of people that use gold. Now, if an additional individual started to use gold with the same purpose, he would increase the value of the network of the institution by 20, and if another individual were incorporated into the institution he would bring its value up to 132. That is a relatively low value for the institution at the time compared to what it could have been in 1971. Suppose that before Richard Nixon eradicated the gold standard, approximately 2 billion people (53.45% of the 1971 population) used it as means of exchange. Using Metcalfe's Law, the value of the institution was 4×10^{18}.

Now suppose there are two different institutions of money, gold standard and silver standard, and it is the year 1971. Both goods have the same characteristics, money-wise; they are equally homogeneous, divisible, durable and fungible. Now suppose there were only 10 people using silver as means of exchange, while there were 2 billion using gold. What would be more attractive to the marginal individual, to use silver or gold as means of exchange? An institutional value of 4×10^{18} nodes sounds much more attractive than an institutional value of 90; the possibilities for exchange are greater with gold than with silver. The more individuals an institution has, the more attractive it will be at the margin to outsiders to join, and insiders to stay.

IV. Informal Institutions and Increasing Returns.

Institutions therefore have a sort of attraction at the margin, which depends on the number of people in it. Returning to the institution in ancient Rome, the more people used the senator-endorsement as means of reputation, the greater it attracted outsiders into the institution. This force of attraction in institutions sounds a lot like gravity. Gravity is the force of attraction between two masses: the bigger the mass, the bigger the gravitational force it will have on the marginal particles. A star has a certain gravitational attraction on the planets and other objects surrounding it, and as more mass builds up in the star, the bigger the gravitational pull it will have. I will now call the amount of people in an institution the "institutional mass," and the bigger this mass is, the more it will attract marginal individuals due to its network externalities.

This force of attraction in institutions is what I will call a Force of Institutional Gravitation (FIG). The FIG of an institution is generated due to its network externalities, and since its network externalities depend on the institutional mass, so does the FIG. A greater institutional mass leads to a greater FIG. An institution cannot grow indefinitely, because the institutional mass has its limitations, which depend on many things, including the kind of institution. Consider the case of Japan during the 17th century as an example. Due to its political situation, it was practically impossible for its people to leave Japan, and also for outsiders to enter. The people over the centuries developed, in a spontaneous way, a code of conduct called *Bushidō*, which governed their behavior and beliefs.

What is the growth limit for this institution? In this case the limitation is merely geographical, since there are no possibilities for more people to join the institution beside the individuals in Japan. Geography is just one possible limitation. Other limitations may include gender, ethnicity, age, socioeconomic status, language, etc. The potential members of an institution (the number of people who are able to join it) are what I will now call the "social nebula." A nebula is a cloud of dust and gases where, due to the gravitational forces of the masses, stars are born. In the same way, social nebulas are a cloud of potential members where institutional stars are born, and just like in a stellar nebula, there are different kinds of institutional stars that may emerge. The formation of these different institutional stars depends on their FIG, but before getting into the different kinds of institutional stars, it will be of a great help to see what exactly determines the force of institutional gravitation.

It has already been said that the FIG depends on the network externalities created by the institutional mass, but only in a Metcalfean way. Another great contributor to the study of network externalities has been David P. Reed, an MIT computer scientist who developed what he called Group-Formation Networks (GFN). According to Reed, the value of a network grows at a faster pace than what Metcalfe proposes. Instead of deriving the value of a network according to the possible nodes, he believes it depends on the potential sub-groups that can be created in a network. As Reed puts it, "a GFN has functionality that directly enables and supports affiliations (such as interest groups, clubs, meetings, communities) among subsets of its customers."[5] In institutional terms, a GFN enables the possibility of the creation of multiple groups within the institution.

The institution of language can give a clear view of the power of Group-Formation Networks. When the number of people speaking a same language increases, the possibilities of sub-group creation also increase. As Silvana Dalmazzone puts it, "knowing a widely spoken language enables the individual to communicate with a larger number of persons and widens the set of possible interactions (employment, investment and trade opportunities, exchange of information, cultural activities, etc.) available to them."[6] Dalmazzone has clearly laid out some of the possible sub-groups that may emerge from this institution.

Now consider formally how Reed views the value of a network *i*, which will be denoted by *R*:

(2)
$$R_i \equiv g(n_i)$$
$$g(n_i) = 2^{n_i}$$

Again we need to impose the restriction of n_i belonging to the positive numbers. R_i is the value of the network *i* under Reed's definition, and its sensibility to the change in the number of users is given by:

(2.1)
$$\frac{dR_i}{dn_i} = \ln(2) \cdot 2^{n_i}$$
$$\frac{d^2 R_i}{dn_i^{\ 2}} = [\ln(2)]^2 \cdot 2^{n_i}$$

In this case, as in equation (1.1), we see evidence of increasing marginal network value due to increases in n_i, and that the function $g(n_i)$ is convex at any point in

[5]David P. Reed, *The Sneaky Exponential: Beyond Metcalfe's Law to the Power of Community Building* (1999) (http://www.reed.com/Papers/GFN/reedslaw.html).

[6]Silvana Dalmazzone, "The Economics of Language: A Network Externalities Approach, in Albert Breton, ed., *Exploring the Economics of Language* (Quebec: Department of Canadian Heritage, 2000).

the function. Reed believes as well that network values can be thought of as network externalities. As was mentioned earlier, Reed believed that the value of the network marginally increased at a greater pace than what Metcalfe believed. We can see this by comparing (1.1) and (2.1) for any given n_i:

$$\frac{dM_i}{dn_i} < \frac{dR_i}{dn_i}$$

for all values of n_i.

This has now been called Reed's Law. It is important to note that the subgroups in Reed's definition are only potential, and it will depend on the necessity of the individuals if they are formed. As Reed puts it, "a potential connection is what economic thinkers call an option, which is the right, but not the obligation, to perform an action at some point in the future."[7] The fact that the GFN is potential and not existing does not imply that the value of the network does not exist. Reed uses a simple example to illustrate this:

> Consider a phone that can call only 911. A customer for such a phone buys it because of a low probability future need to call for emergency help; in fact, the customer probably takes other steps never to need to use the phone. But the existence of a lucrative market for such phones indicates that customers can value potential connectivity to a single point, even though the connection is never used. Potential connectivity to many points should have value proportionally larger, since it is not necessary to use the connection to find value in its availability.

[7]Reed, *op. cit.*

V. Force of Institutional Gravitation and Informal Institutional Dynamics.

Now that the basic concepts of network externalities and institutions have been defined, it is possible to propose a model for the Force of Institutional Gravitation. This force is what attracts the individuals in the social nebulas that are not associated to the institution to participate in it. Therefore, since the number of nodes (Metcalfe's Law) and the number of subgroups (Reed's Law) is what creates the network externalities in an institutional star, and the force affects the nonparticipants in the social nebula, the equation for the FIG will be:

$$\text{Force of Institutional Gravitation} = \frac{\text{M}_\text{i} \times \text{R}_i}{\text{Social Nebula} - \text{Participating Individuals}}$$

$$(3) \qquad FIG_i = \frac{\left[n_i(n_i - 1)\right]^{\lambda} \cdot \left[2^{n_i}\right]^{(1-\lambda)}}{N_i - n_i}$$

$$n_i \in [0, N_i]$$
$$N_i \in [0, \infty)$$
$$\lambda \in \{0,1\}$$

n_i being the number of individuals in the institution *i,* and N_i being the sum of potential members in the social nebula of *i.* All the nodes and sub-groups are assumed to be of equal value.

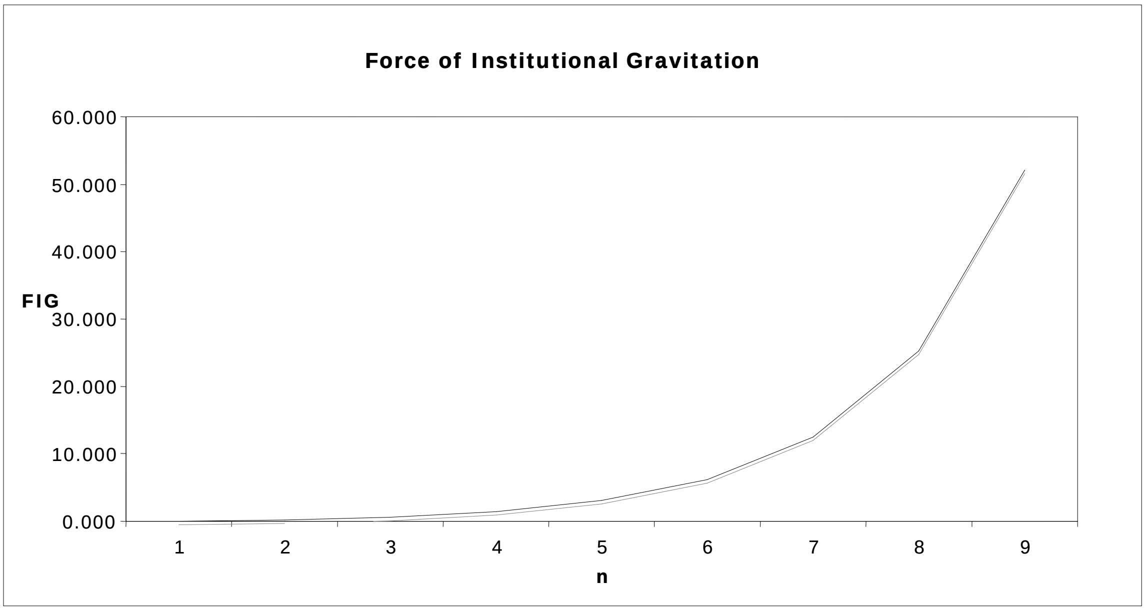
The number of sub-groups in Reed's Law include all of the nodes that Metcalfe's accounts for. This is because one of the possible sets of sub-groups is two person sub-groups. The sum of all the two person sub-groups is equal to the number of nodes. If an institution has the property that its value is a function of the number of subgroups, $g(n_i)$, then λ will take the value of 1. Now, if the institution does not have the characteristic of group formation and only that of nodes, λ will take the value of 0. The hypothesis that alternate institutions have different network externalities characteristics is an important idea in this subject, but for further research. For the sake of the theoretical analysis and simplicity (I am an economist, after all), I will assume that all institutions referred to in this paper are in accordance to Reed's Law. For this reason and simplification, the Force of Institutional Gravitation will be reduced to the following equation excluding the possibility of group-formation:

$$(4) \qquad FIG_i = \frac{R_i}{N_i - n_i} = \frac{2^{n_i}}{N_i - n_i}$$

As n_i increases, the Force of Institutional Gravitation also increases, as shown in the figure below. In the short run, N_i will be constant, which is why the assumption will be carried throughout the paper, but in the long run it may either increase or decrease.

The higher the percentage of participating individuals, the higher the force of institutional gravitation will be on the non-participating. Following Reed's interpretation of the GFN, the FIG depends on the *potential* nodes and sub-groups, not the existing. It is worth noting that the force of institutional gravitation, does not imply that individuals will automatically be incorporate in the institution, since the FIG simply exposes the benefits of the participation, not the costs. Assuming that individuals are *homo economicus*, it may be possible that even if the FIG is large, it may not have the consequence of additional incorporation of non-participants, due to higher costs than benefits. The costs of incorporation are normally opportunity costs, the sacrificing of other networks to be part of the institution, but there may be other costs as well.

There is still some information left out of this equation. The FIG does not only depend on Metcalfe's and Reed's Law, but it also depends on variables that are exogenous to the network externalities effects. Bringing back the gold and silver



example, one important assumption was that both institutions had the same characteristics (money wise), but this is not necessary true. There may be other factors that attract marginal individuals to an institution that does not depend on the number of individuals in the institution *ex ante*. A constant needs to be added to the network externalities effects to avoid the mistake of excluding these exogenous variables. The equation should therefore be:

$$FIG_i = \alpha_i + \frac{2^{n_i}}{N_i - n_i}$$

α_i being the sum of the exogenous variables that have an effect on the FIG.

Following the example of money, the institution of gold as means of exchange would have a higher α than silver. Assuming that both gold and silver belong to the same social nebula and have the same number of participating individuals, gold will have a higher force of institutional gravitation over non-participating individuals than silver. For the sake the argument, and analyzing only the effect of Metcalfe's Law and Reed's Law on the FIG, we will assume a *ceteris paribus* condition, and α will be the same for every institution in a common social nebula.

Now consider how a change in the number of people in an institution will affect the attractiveness at the margin. Taking the first order derivative of FIG with respect to n_i, we get the following:

$$\frac{\partial FIG_i}{\partial n_i} = \frac{2^{n_i}[\ln(2)(N_i - n_i) + 1]}{(N_i - n_i)^2}$$

The first order derivative will always be positive (when n_i and N_i are bound by the restrictions in (3)). It can be verified that the second order derivative is also positive for the entire domain of n_i, which means that FIG is convex. The FIG is therefore consistent with the characteristic of the institution having network externalities due to the amount of individuals in it. This simple model will enable us to interpret different kinds of institutions according to their FIG.

VI. Stars and Institutional Stars.

We now have a clear view of what the force of institutional gravitation depends on and its tendency, and we can analyze the different institutional "stars" that can be formed in the social nebula. All stars start in the same way, but gradually turn into different kinds. One of the most interesting results of stars are black holes. Stephen Hawking, in his book *A Brief History of Time*, gives an excellent description of what black holes are. These are concentration of masses which are so intense that their gravity is incredibly strong. Due to this immense force, any particle (even light) in its proximity is attracted to the huge mass, with no possibility of escape.[8] Another kind of star is the white dwarf. These stars are masses that have existed for a relatively long time, and due to their low mass level, are very unstable. These stars can be absorbed by a larger and more stable mass when it comes to their proximity. The last case to be analyzed is when a star ends due to gravitational collapse. This kind of collapse is a consequence of the inability of the mass to maintain itself, and therefore collapses due to its own gravity. As

[8]This is still a controversial issue, since some astronomers believe that mass attracted to a black hole may escape through other means, but for the sake of argument we will assume this is impossible.

we shall see, there are institutions that share the same characteristics with the stars described above.

The institutional black holes are those that, due to their high level of institutional mass, have a FIG so powerful that every individual in the social nebula will be attracted to it, with no possibility of getting out. During the twentieth century, there was a prisoner's code in many prisons in the United States, and it is a good example of an institutional black hole. All prisoners followed this unwritten code, which governed their behavior in many ways, including relationships with guards, the management of information about possible escapes, sexual relationships between inmates, etc.[9] Any prisoner who disobeyed the prisoner's code was punished by his fellow inmates in many ways. When new prisoners arrived (or *fish*, as they called them) they were immediately drawn to the institution, with no possibility of getting out due to the high costs of doing so. The participants were all of the potential members in the social nebula, so $n = N$. As N either increased or decreased, n also increased or decreased, maintaining the $n = N$ condition. Following the FIG equation, this meant that the force of institutional gravitation was infinite for that institution:

$$FIG_i = \lim_{n_i \to N_i} \frac{2^{n_i}}{N_i - n_i} = \infty$$

This fits well with the description of a black hole, since any particle (individual) in its proximity (social nebula) was attracted with the greatest possible force to the mass (institutional star).

[9]Morris G. Caldwell, "Group Dynamics in the Prison Community," *Journal of Criminal Law, Criminology, and Police Science*, 46 (Jan–Feb 1956): 648–57.

The institutional white dwarfs are another type of institutional stars that may exist in a social nebula. These institutions, just as stellar white dwarfs, are those that have existed for a long time, and due to their relatively low institutional mass, the individuals in them may be attracted to a bigger institutional star with a greater FIG in its presence. A good example of this is the measurement of time in Japan. Before the sixteenth century, Japan had lived in what was called *Sakoku*, a period in which Japan was isolated from the rest of the world. During this period, the Japanese used to measure time in a different way than how most of us do in the twenty-first century. Their measurement divided daytime into six equal units of time, and night in another six.[10] This institution in Japan had worked well within its geographically limited social nebula. In 1550 the Portuguese Jesuit Francis Xavier introduced the mechanical clock in Japan, which consisted of the Western measurement of time in hours, minutes and seconds. At first the new institution was rejected due to the fact that the FIG of the old institution of measurement was strong. After a few years, when the period of *Sakoku* ended, the Japanese social nebula was incorporated into a larger, international social nebula, increasing N.

Both institutions (Japanese measurement of time and Western measurement of time) now shared the same social nebula, N. Due to the fact that N is limited, the two FIG's competed with each other, even if not all potential members were part of either institution. Since the Western nebula had a fairly larger proportion of N and consequently more nodes and

[10]Carlo M. Cipolla, *Clocks and Culture, 1300-1700* (New York: Norton, 2003), p. 106.

sub-groups, the people in the white dwarf were attracted to the new and stronger institutional star. The fact that they had opened their borders meant they had to deal with foreigners, all of whom measured time in hours, minutes and seconds. Japan's institution disappeared due to the emergence of another institution with a relative stronger force of institutional gravitation, just as stellar white dwarfs tend to disappear.

Using the FIG model can be a good illustration of the effect caused by a strong institutional star on an institutional white dwarf. Western measurement of time will be institution *a*, and the Japanese measurement of time will be institution *b*. The forces of institutional gravitation for the institution are:

$$FIG_a = \frac{2^{n_a}}{N_a - n_a}$$

$$FIG_b = \frac{2^{n_b}}{N_b - n_b}$$

Before Japan opened its frontiers, these two forces did not interfere with each other, since they belonged to separate social nebular. As mentioned before, after the end of the *Sakoku* period the Japanese social nebula became part of the Western one, which resulted in a new social nebula that consisted of $N_a + N_b$. Institution *a* had more participants than *b*, so $n_b < n_a$. The collision of the two social nebulas changed the forces of institutional gravitation for both institutions in the following way:

$$FIG_a{}' = \frac{2^{n_a}}{(N_a + N_b) - n_a}$$

$$FIG_b{}' = \frac{2^{n_b}}{(N_b + N_a) - n_b}$$

Now that both institutions belong to the same social nebula, their forces do interfere with each other, and since institution *a* had more participants than *b*, this results in $FIG_b{}' < FIG_a{}'$, so *a*'s force will attract the participants of *b*, and eventually make the institutional white dwarf disappear, increasing $FIG_a{}'$ up to the point where:

$$FIG_a'' = \frac{2^{(n_a + n_b)}}{(N_a + N_b) - (n_a + n_b)}$$

The last case of institutional star to analyze is the gravitational collapse of an institutional star. This idea can be easily illustrated with an institution that prevailed in societies such as New Guinea and the Caraïbes in the Caribbean islands. This was the institution of cannibalism, the purpose of which was to acquire the wisdom of the dead by eating parts of them. In the case of New Guinea, there was a virus called Kuru that was transmitted by eating human brains, and if it had not been for an Australian law in 1959 that prohibited cannibalism, the society would have collapsed.[11] In other cases, such as in the Caraïbes, cannibalism was a well-practiced custom among the living. This lead to a decrease in the number of active participants as the amount of new participants grew. The more people began to practice cannibalism, the more people from the institution died. In some cases, this would have lead to a constant decrease in *n*, until it reached zero:

$$FIG_i = \frac{2^0 - 1}{N_i - 0} = 0$$

When this happened, the FIG of the can-

[11]Jared Diamond, *Guns, Germs and Steel: The Fates of Human Societies* (New York: Norton, 1997).

nibalism institution fell to zero as well; this would have ended the institution, as well as its members. The case of this custom is similar to the stars that collapse due to their gravity; the institution could not support a strong gravity, and collapse due to it.

VII. Concluding Remarks.

Network externalities are not only an important tool for analyzing technology and networks, but also give an insight on how institutions are formed. This effect creates large benefits for the incorporation of an additional individual for both the active participants, and the marginal. The analogy with the different stars takes the analysis further and gives a better understanding of why some institutions include large proportions of societies and last so long while others perish under the presence of other institutions. I am sure there are many more institutional stars in the mysterious universe of mankind, and of various types. Some may be black holes or white dwarfs, others may be even institutional galaxies or supernovas. Thinking of institutions as stars allows us to classify them, and to study them in a unique way. The importance of the effect of increasing returns in Level 1 institutions may give us practical tools in institutional design and replication. As seen in all of the examples in the paper, informal institutions greatly affect the decisions of individuals; they should hence be incorporated into every economic analysis, because institutions *do* matter.

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