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The Implications of Institutional Limits in a Complex World

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speaks to opportunities that remain to be seized. Who knows what it can achieve when it does so?

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ity can only get what they want by crippling the options of most people so they'll actually submit to hierarchy. Similar dynamics are at play for the reactionaries who desire decentralized eugenics. In both cases, dynamism must be sacrificed on the altar of social stability. Scarcity must be violently imposed on the population so that the desired outcome actually happens. For them, competition means choice for a minority achieved by limiting choice for the majority.

That ideological discourse largely fails to drill into motivations behind those speaks to broader pathologies at play when it comes to political philosophy. The frameworks given to us by long-dead founders have become so fundamental to a larger web of arguments, alliances, and perspectives that lacks any real consistency.

However this tangle is slowly eroding. Information abundance, new channels for discourse and the repeated failures of 20th century liberalism over the last two decades have all had their part to play in the discrediting of ideological frameworks. The most obvious example of this today is the reorientation we are seeing on the right as adherents, especially the young, are reconsidering the broad framework established during the Cold War. Such fracturing is also occurring on the left and will undoubtedly result in similar reorientations.

The death of these frameworks will be a painful process. Taking a critical lens to the inherited models and theory means opening fault lines that will both destroy alliances and also reveal commonalities with tendencies previously considered beyond the pale. This will be a period of disillusionment for many.

But the good news is that the reward is worth the discomfort. While the left may have fucked up by defaulting to institutions, many of its enemies have made a similar mistake and rely on control hierarchies to get stuff done. Hence, all the same limitations and vulnerabilities apply. That the left has systematically failed to incorporate such insights into its strategy, tactics and theory

Re-examining markets

But these insights into the capacity of systems to handle complexity doesn't just give us insights into the state of the world and how things might develop. They also let us examine the often unstated motivations for why various factions support or oppose markets.

There are many angles I could approach this from, but I think the best is through the word "competition". Leftists tend to have an instinctive repulsion, those on the right claim to be attracted to the word. But the underlying reasons for why someone feels this way is rarely spelled out.

But if you take competitiveness of a situation as simply the measure of choice an individual has in a particular domain the result is illuminating. To give an obvious example, *Das Kapital* is basically an extensive study of what happens when there is an uncompetitive labor market, when the vast majority of people *lack choice* over where they do or do not spend their labor (non-market forms of provisioning ourselves count as choice here). By making low-overhead hustling and/or non-market means of provisioning themselves difficult, the state creates a class of people who have no choice but to sell themselves to others.

Such restriction of choice is not just unjust, but is also imposed at the cost of overall economic dynamism. The main source of economic growth is through discovering new ways to do things, not working people to death or devastating the land (we had slavery and ecological exploitation before the industrial revolution and they did little-to-nothing for overall growth). The best way to see sustainable economic growth is by giving people the freedom to explore what is possible and build for themselves, not to turn them into de facto slaves.

These insights reveal just how dishonest conservatives or reactionaries who claim to support markets are. Conservatives who favor markets because they force people to work and respect author-

Let me begin by stating how happy I am that this exchange is happening. As information technology has come to saturate our lives over the last two decades we've seen the debate over non-market economies remerge. A recent essay published in *The Economist*¹ both summarizes the discourse and speaks to its increasing prominence. In the coming years the debate will likely be further mainstreamed as we see disruption of the labor market thanks to technology, the failings of capitalism become more obvious and leftists incorporate these insights. The consequences of these ideas is impossible to predict, but it could very well inform the policy of states, the demands of activist movements and the day to day activity of regular people living their lives. This exchange, no matter however seemingly marginal, could end up being an essential part of a discourse that ends up changing the world.

(no pressure)

This essay critiques what I'll term *Institutional Non-Market Economy/ies (INME)*. The primary way decisions are made about how labor is to be deployed, what projects are to be invested in, and how individuals go about consuming in an INME is through institutions (fixed bodies that govern how labor or resources are to be deployed). The ways an INME can be organized range from the highly centralized (state socialism) to hybrid models (republican socialism) to decentralized (anarcho-collectivism). The most comprehensive articulation of how an INME would work is *Towards a New Socialism* by Paul Cockshott and Allin Cortell and it is through this text that I will be examining the flaws of institutions. While many proponents of non-market economies no doubt approach this text

¹ This piece is unfortunately behind a paywall. But the reason I included the article was to show that people who write for *The Economist* were taking the debate seriously, not because it actually contains anything of relevance to my argument, so it doesn't matter if you can access it (I'm going to avoid giving instructions about how you'd go about bypassing the paywall as the approaches content "owners" use to defend their IP constantly evolve).

critically and would implement alternative approaches, the solutions the authors put forward to deal with economic questions can be used to show fundamental problems with any non-market economy. Therefore my critiques should apply to all attempts to build INMEs (as for non-market, non-institutional economies, I do not believe they are capable of achieving complex economies and therefore are beyond the scope of this essay).

Moreover, just because I believe that INMEs have considerable problems, does not mean all innovations their proponents develop are bad or that I consider experiments to build them to be a waste of time. One of the most frustrating things about discourse around radical alternatives to our current economy is that everyone is assumed to be a die-hard proponent of their particular approach. No political movement has ever implemented their ideology perfectly and my support for markets is not out of an intrinsic desire for markets in and of themselves, but rather because I see them as a useful means in pursuit of my overall goal of universal emancipation. If proponents of non-market systems make good points about how to get stuff done or show through experiment how they can work, I am perfectly willing to accept their points and successes.

With that out of the way, let me explain the inherent limitations to institutions (and by extension INMEs).

For an INME to function it must have a mechanism to determine the value of an individual's labor so it can direct resources rationally. For simple labor that requires little education this is not really an issue as individuals are interchangeable. However for labor that requires investment to become proficient, you need to have some mechanism of evaluating labor so you can choose between different projects to make effective decisions. The most comprehensive articulation of this process that I know of is found in chapter 2 of Cockshott and Cortell's *Towards a New Socialism* under the section *Skilled Labor as a 'Produced Input'*. Their scheme to determine the value of skilled labor is as follows:

forms of financial control more difficult (even if you take the most cynical view of say, Bitcoin – that it's a wasteful ponzi scheme promoted by Chinese billionaires who want to escape CCP currency controls – it still serves as a competing currency on the world market and as a hedge against state mismanagement of funds).

- In the last century technological advancement has given states immense destructive potential but we haven't had a conventional war in close to 70 years and states across the board struggle to shut down insurgencies that fight with a fraction of the resources states possess.
- Phenomena like climate change, aging populations, and biosecurity risks are all long term disruptive phenomena that require significant change to both mitigate and adapt to that will upend the existing order.

I don't believe that such dynamics will automatically erode the state (nor that such erosion will automatically be a net positive). What's far more likely is a reconfiguration of the state towards a more flexible form that can better deal with the complexities of the modern world. Such reconfiguration would have positive and negative outcomes while also creating space for alternative forms of governance to arise. And while there is certainly the possibility for positive outcomes here, it does cast serious doubt on using the nation state as a means by which to achieve progressive ends.

But the state is obviously not the only means by which we can achieve leftist ends. Giving people more options not only lets them better respond to the aforementioned crises, but it also gives them the ability to resist capitalism and authoritarian states. Empowering people to make decisions for themselves, instead of shepherding them into institutions that direct their behavior, is a strategy appropriate for the material conditions we see today.

proletariat achieve a decisive political victory (whether through revolution or through the ballot box). Once we have seized the state (through whatever means) we can begin the process of building a postcapitalist world (certainly Marxism as a broad body of thought is more complicated than this, but many Marxists and leftists more broadly believe this to be the case).

Such a strategy is outdated because it relies upon an organizational model that is in crisis the world over. Despite the upheaval that is increasingly becoming a constant in our lives, many on the left default to institutions as the solution, specifically the state.

Yet the nation state faces the following challenges that make its capacity as a force for positive change questionable:

- New information technologies are delegitimizing existing ideologies and are increasing the capacity of regular people to coordinate by orders of magnitude.
- Despite the massive increase in state capacity to monitor and control, technological empowerment of individuals is straining its capacity to maintain order.
- Many bright, dedicated people are alienated from capitalism and the state. They hold values that go against the values such structures encourage (either implicitly or explicitly). The spaces opened by the internet has resulted in many of these people finding outlets for those values in areas that have the potential to undermine institutions (this won't necessarily lead to liberation, some of those people are reactionaries).
- The increasing debt of major states like the US will multiply the impact of shocks or trends that disrupt or erode their hegemony (the US dollar is, after all, backed by the US military). Not to mention cryptocurrencies have the potential to create currencies outside the state that make traditional

We can envision the establishment of a baseline level of general education: workers educated to this level only will be regarded as 'simple labour', while the labour of workers who have received additional special education is treated as a 'produced input', much like other means of production. This notion of skilled labour as a produced input may be illustrated by example.

Suppose that becoming a competent engineer requires four years of study beyond the basic level of education. This four-year production process for skilled engineering labour involves a variety of labour inputs. First there is the work of the student—attending lectures, study in the library, lab work, etc. As stated earlier, this is regarded as valid productive work and is rewarded accordingly. It is counted as a 'simple labour' input. Second is the work of teaching, distributed over the number of students being taught. This is a skilled labour input. Third, there is the 'overhead' work connected with education (librarians, technicians, administrators). This may be a mixture of skilled and simple labour.

Let us put aside the obvious anarchist/postmodernist critiques of such schemes that figures like James C. Scott or Michel Foucault would make in response to such a scheme. That it can somehow overcome the problem of determining whether the labor that goes into training an individual is actually useful. That there is no wasted labor throughout the entire process by any of the individuals involved. That such tracking is even possible. I will give proponents of INMEs the benefit of the doubt and handwave these considerable problems away.

What can't be ignored however is the problem of making sure that new information is integrated into the economy. For a mod-

ern economy to function it must not merely rationally allocate resources according to a fixed set of knowledge, but it must also incorporate new information and update procedures and processes accordingly.

This process is challenging to do not just because codifying new knowledge is difficult, but also because the consequences of new discoveries can be far reaching and difficult-if-not-impossible to predict. An economy is one of the go-to examples of a complex system and seemingly small perturbations in one area can have significant consequences. Mapping out how technological change impacts a single profession or industry is hard enough, but you must then analyze the nth order effects that flow on from the initial change.

Now in many cases you can get by with accepting inefficiencies. Certainly not every development will be world changing and capitalism certainly gets by with deliberate inefficiencies and waste. But even if the number of developments that result in cascading change throughout society is tiny, you still risk losing out on what could be significant benefits. An INME must restrict and slow such changes so that the internal map of the economy it maintains reflects the territory of what is actually happening. Should the model and reality diverge, accurate assessment becomes impossible and the INME can no longer make rational decisions. Hence INME must systematically restrict the actors within them so that they may function.

Markets, while not perfect, let individuals make snap judgments about the value of a particular approach or technology. Certainly this approach is messy, but it has the virtue of privileging autonomy and self-direction while also distributing the risks of experimentation across the population instead of in a small number of institutions. Furthermore, while the process of making a decision may *begin* with the individual, it does not have to *end* with them. Before making a decision, individuals can hopefully tap into an ecosystem of individuals, institutions, and algorithms

consequences we can bring about today. Far from succumbing to “bourgeoisie ideology”, giving people more depth and breadth² of choice is both an essential characteristic of a liberated society and a key strategy towards achieving a liberated world.

Interestingly, such a perspective is entirely in line with Marxist assumptions of how capitalism overcame feudal relations. Capitalism came about not after a revolution which allowed the bourgeoisie to start trading, but rather over a protracted period in which the power of feudal relations was eroded. Phenomena like warfare between states, disease, poor financial management, and internal conflict between nobility and other factions within society all created stressors that had to be managed, while technological advancement and proliferation created more options for people. Social formations that had lasted centuries found themselves unable to cope with the increase in complexity and they started making mistakes. These mistakes resulted in revolutions, wars or reforms which forced more complex social structures that could handle the increase in environmental complexity.

Now to be sure the dynamics are more complicated than the quick summary I’ve laid out. But there is a definite trend of feudal states being replaced by more liberal states and a core driver of this is rising complexity. Central to this is individual freedom. The relatively rigid roles that defined feudal relations went against the need for flexibility, specialization, and adaptability that complex technological societies demand. Modernity is characterized by constant change and that goes against the aspirations of pre-modern states for stasis.

But when it comes to moving beyond capitalism, orthodox Marxism tells us that we cannot make any meaningful changes until the

² Depth and breadth of choice refers to the number of choices available to an individual over a given time frame. William Gillis’ *Setting the Universe on Fire* is a quick introduction to the concept. Similar to the concept of complexity, this approach to freedom has the virtue of applying at multiple scales and as such lets you evaluate the freedom of a society or even humanity writ large.

to function, they must limit the range of behavior of those they manage so they can be directed rationally.

Such restriction of complexity is necessary for the system to survive. Yaneer Bar-Yam writes:

[All systems] exist within an environment that places demands upon them. If the complexity of these demands exceeds the complexity of an organization, the organization will be likely to fail. Thus, those ... [systems] that survive must have a complexity sufficiently large to respond to the complexity of environmental demands at the scale of these demands.

As such, no matter the values of those who promote them, INMEs trend towards conservatism. Too much disruption and change disrupts the ability of institutions to function, which means they must slow down and suppress change so as to maintain control. This conservative tendency can turn outright reactionary if those managing institutions decide that the value institutions bring outweighs the phenomena that are making control difficult and they stamp it out through force.

If true, this unfortunately means that many left wing projects had reactionary tendencies baked into their structure from the beginning. But it does not mean there are no alternatives to capitalism. In fact, these critiques cut just as sharply against capitalism as they do against INMEs. As Kevin Carson pointed out, the large disparities of wealth and power within capitalism came about and remain thanks to the state simplifying the environment firms operate within through violence. For capitalism to work, the options of the majority of people must be limited so that they are forced to buy into the system.

Hence increasing having a society that is more complex, in which individuals are not something we achieve after the revolution or whatever, but is instead a strategic imperative with radical

that augment their capacity to make decisions. That such cognitive tools are deficient in many ways or are flat out missing speaks not to inherent tendencies of markets to erode or neglect such technologies, but rather to the requirements of those in power to maintain information scarcity.

So reorganizing centralized economic processes when circumstances change is problematic. But what about decentralized alternatives? How do they fare?

Certainly by decentralizing the process you certainly gain more capacity to adapt to change. And by giving people choice in terms of the institutions they interact with you can mitigate the pathologies of centralization by letting them easily move to alternatives.

However if collectives evaluate the value of labor internally and do not take instructions from a central institution, then they must have some sort of mechanism to come to an agreement on what the labor of particular roles is worth. This allows for more accurate assessments that reflect the particular conditions, but also introduces market dynamics in the form of labor bargaining between collectives.

Now maybe this isn't a problem for proponents of INMEs because they see these market dynamics are sufficiently restricted and because they believe that by making the bargaining process a collective one more equitable outcomes will result. But you can't avoid some formal process to decide how to negotiate the value of labor. No matter how you go about it you either involve people who have no idea as to what you do (both wasting their time and providing little in the way of meaningful feedback) or you risk centralizing control of the collective's resources in the hands of a few. This is especially true as technology progresses, as automation removes the need for people to work simple tasks and what labor remains is about grappling with a complex, open ended environment. And while such work tends to be highly engaging and meaningful, it is also difficult to codify. When we're all working on specialized, eclectic tasks evaluating the "value" that our fellow

commune members bring to the table is difficult because we simply don't know enough to make accurate assessments.

Hence there is a trade-off between centralized approaches and decentralized approaches. Centralized approaches ignore local context and are slower to adapt, but give you reliable numbers that you can make decisions with. Decentralized approaches give you more accurate graduations of what the value of labor is actually worth, but demand more time from the collective and introduce soft market mechanisms. Both solutions are inadequate for a globalized world in which individuals from across the planet cooperate in novel ways.

Complexity and the limits to control

All the problems I've raised stem from the fact that institutions must limit the range of behavior of the people that make them up in order to function. To understand this happens, let's turn to the complex systems theorist Yaneer Bar-Yam and his 1996 paper, *Complexity Rising: From Human Beings to Human Civilization*, explains why this is the case:

[D]uring the time of ancient empires, large-scale human systems executed relatively simple behaviors, and individuals performed relatively simple individual tasks that were repeated by many individuals over time to have a large-scale effect. ... [The nature of the activity was simple enough that one individual could direct a large number of individuals. Thus, hierarchies had a large branching ratio: each controller was in charge of a large number of individuals.

As time progressed, the behavior of individuals diversified as did the collective tasks they performed. The increasing diversity of individual behaviors implies an

increase in the complexity of the entire system viewed at the scale of the individual. Consequently, this required reducing the branching ratio by adding layers of management that served to exercise local control. As viewed by higher levels of management, each layer simplified the behavior to the point where an individual could control it. The hierarchy acts as a mechanism for communication of information to and from management. The role is also a filtering one, where the amount of information is reduced on the way up.

...

As the collective behavioral complexity at the scale of an individual increases, the branching ratio of the control structure becomes smaller and smaller so that fewer individuals are directed by a single manager, and the number of layers of management increases. The formation of such branching structures allows an inherently more complex local behavior of the individuals, and a larger complexity of the collective behavior as well.

At the point at which the collective complexity reaches the complexity of an individual, the process of complexity increase encounters the limitations of hierarchical structures.

(For those who have a background in cybernetics, Bar-Yam's definition of complexity is analogous to that of variety).

While this paper uses the examples of individuals controlling others through hierarchy, the principles at play apply to any system that looks to control the behavior of other systems. As such the critique applies to institutions. While most leftists who support INMEs use the language of democracy and self-determination, you cannot define control hierarchies out of existence. For institutions