

Star Trek Economy? Direct Logistics

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I was in Berlin when the Wall came down. That was November 1989. Quite the daring *On the Road* Bohemian maniac at the time, I immediately went over to East Berlin, and that very night met the daughter of a high-ranking communist official. On New Year's Eve, 1990, she brought me along to a party in East Berlin's *Am Treptower Park* where I met two young technocrats from the East German Ministry of Finance. When they realized I was an American (my accent is good, but not that good), they proceeded to tell me all about how their department had been using the latest-greatest IBM mainframes. They explained how their mainframes weren't really IBM, but a hodge-podge of "special procurements" and reverse engineering. They even said IBM people secretly visited them once to marvel techie-to-techie at their feat.

As the evening wore on, they told me everything I wanted to know about how the East German communist economy worked. After all, it didn't matter anymore. The German Democratic Republic was over, and my new friends down at the Ministry were just going through the motions until *der kalte Anschluss* (the cold annexation) with West Germany would sweep the GDR into the history books.

What they told me sounded like something I had taught my business math students back during my grad days: Wassily Leontief's idea of the [Input-Output Matrix](#), only writ large, *very* large. Basically, you create a huge matrix with everything and everyone listed along the rows and again along the columns. Imagine those mileage charts in your old road atlas where you'd look up the *from* city along the row, then the *to* city along the column, then follow the row across and the column down to where they meet for your mileage. That's roughly what input-output is doing, e.g., Factory A (on row 12) produces widget-A, which, in turn, is consumed by Factory X, Y, and Z in columns 23, 24, and 25 respectively. Now, do that sort of input-output match-up for literally every possible thing in your economy and you should have a smoothly-running, can't-miss socialist utopia. Alas, despite their budding Lo-Tek systems, my

techie friends never got close to the computational and networking power they needed to pull off such an über-matrix. But the whole idea of running an economy by matrix stuck with me.

I had met Marion the very night the Wall came down, Thursday, November 9. I moved in with her shortly thereafter and, in the following months, was given a grand tour of the quickly fading East German world. After my tech conversation at the party, the GDR made a lot more sense. I had noticed how the typical East German never seemed to take money very serious; the East German mark was like so much fake Monopoly money. Buying and selling, exchanging the currency, seemed to be just a vestigial motion everyone was going through. After all, rent could be just *five* marks a month, i.e., a dime or two on the black market currency exchanges around the West Berlin train stations. Bread was just a few of those flimsy *Pfennig* coins, amounting to nothing. It became obvious that the real supply and demand happened somewhere else, perhaps in offices where request forms circulated and were eventually stamped *approved* or *denied*. For example, Marion and I frequented the quaint historic fishing village Vitt on the Baltic Sea island of Rügen. Nearby was the famous lighthouse of *Kap* (Cape) *Arkona*. Marion and I tried to buy the smaller lighthouse designed by Karl Friedrich Schinkel for a few thousand U.S. dollars. It was more a question of who to ask and what forms to fill out. Earlier, we had been offered a nearby thatched-roof cottage by the local agriculture collective for three thousand east mark, which amounted to maybe a hundred dollars or so. After all, who would want to live in a house with a thatched roof?

And yet the East German system was the pride of the Communist Block, with Cubans, North Vietnamese, Angolans all clamoring to come and be *guest workers*. Marion once took me to the *Exquisit-Laden* on the famous Unter der Linden Boulevard where half-way stylish Western-looking clothing was sold. I bought an imitation Ralph Lauren polo shirt. Yes, East Germany worked, sort of, obviously not as well as West Germany, but the basics were covered, and a decent imitation of West Germany's wall-to-wall opulence was achieved in certain categories. And yet one question remained, Why had my Finance Ministry geek friends been so technocratic—and so obviously blasé about what I

understood Marxism to be? No mention of workers, no leftist sloganeering, no spontaneous *L'internationale* singing, no talk of the arrogant bourgeoisie and their super-annoying running-dog lackeys. Confusing indeed.

What I now think of Marxism explains East Germany much better. Here goes: Marx and Lenin were really on about the eventual, inevitable path of goods and services from labor-intensive, one-off craftsman's handiwork, i.e., localized cottage industry—*past* capitalist industrialism (very important point!)— to what I'm calling *total commoditization*, or TC for short. Some people call this *post industrialism*, but it's far more than that. I don't like the word industrialism, partly because of the association with smelly, ugly factories, which doesn't fully cover the evolution of a product from the local craftsman to the eventual terminal technology, that being, of course, Star Trek's *replicator* technology!!!

Yes indeed, Star Trek replicators—miracle machines ranging from food synthesizers all the way up to industrial systems. This is terminal TC, or, as the Germans might say, *Endrationalisierung*, or final rationalization. Now, will TC be exactly like what we've seen on Star Trek? Functionally yes. Once again, science fiction serves as a good narrative for where it's all heading. And even if we don't get Earl Grey Tea (including stylish mug) reconstructed at the sub-atomic level before our eyes, there will come totally automated, soup-to-nuts, amazingly entropy-cheating systems for the bulk of our goods and services. This is the arc of industrialization that started back in the medieval age.

V.I. Lenin once said in an interview at a swank Zürich restaurant, "See this salt and pepper and sugar? The restaurant is giving them away. This is how everything will be." . . . which is basically what experts who have analyzed the imaginary Star Trek economy have said. Everything will be so totally commoditized, so automated and abundant, that the capitalist will be unnecessary, ergo, money—an artificial keep-away device in an artificial scarcity environment—will be obsolete. . . . Really? Yes, that is pretty much what I saw in East Germany—money on its way out, TC on its way in. Really? Well, not completely. They kinda got ahead of themselves, i.e, they sort of underestimated the difficulty in moving everything over to TC. . . .

No concept of money the East German. I heard stories of people with savings accounts stuffed with hundreds of thousands of east mark. They were considered daft because you didn't need hardly any money to get the basics—and everything else wasn't really to be had with money anyway. Again, serious, big-ticket-items came by way of the rivers of paper winding their way through the various organs of state, and, as I finally realized, organs clearly in need of cheap, ubiquitous, microchip-based, networked computers if they ever wanted what Lenin was talking about. I did ask my Finance Ministry friends if they'd heard of *Sun Microsystems*, which was riding high at the time . . . and they murmured something back, maybe. Sadly enough, what they really needed, i.e., Sun's "The Network Is The Computer," was not on their radar screen.

I guess I've thrown down a pretty big "what if" here. What if the relatively over-achieving East Germans had had millions of cheap Boxen all loaded with free software like GNU, Linux, BSD, all networked by an Internet? Could they have whipped their sluggish, under-performing, not-ready-for-TC-prime-time economy into shape?

It was obvious they didn't do capitalist-style hard accounting, that whole Western hang-up where sales revenue must cover expenses, with something left over for payroll, stockholders, R&D, and expansion. Seemingly, *everything* was a loss-leader. And yet I don't think soft accounting was the real problem. Again, they simply did not have the network logistics and requisite processing power to reach escape velocity from Stalinist "command" economics into Star Trek TC. And, as we all saw, faking it, papering over failures, always hard-wiring past the blown fuses, eventually came crashing down.

Almost a year later I broke up with Marion. Reeling from emotional turmoil, I left Berlin and returned to the States. I went to work in Silicon Valley as a Cobol programmer for a company doing computer systems for local government. But it was no good. No, it wasn't Cobol's fault, rather, I was adrift somewhere over the North Atlantic. I couldn't help but roil and boil in all the wild contrasts of California and Central Europe. The cognitive dissonance raged, and I

eventually lost the job. And it wasn't because I'd become a communist. Marion, after all, was as bourgeois in her East German way as any upper-middle-class patrician in our world. To be sure, my whole East German experience had been so completely devoid of any sort of Marxist anything. My two techies only spoke of logistics, a *direct* logistics that didn't seem to pay much attention to the circulation of the currency supposedly representing commerce. No *hard* accounting. Money de facto demoted as the primary information carrier. So mind blowing! I would never be the same.

Direct Logistics

So one basic question is, Can an economy do without hard accounting? Can it shift away from measuring everything in terms of a currency? Can the actual to-and-from, supply-and-demand logistics be the main gig? Can we really, entirely get rid of money in all of its forms?

Today, our money-based free market paradigm necessarily abstracts away from logistics. Everything economics is expressed in terms of money: quarterly sales, stocks and bonds figures, a fiat money supply controlled by the Federal Reserve. Even when logistical issues are discussed, it is always in terms of money. . . . And we should forget all that? Forget board meetings where profits are the only topic? Profits are down at your typical board meeting, and then the underlying logistical reasons are discussed . . . and mucked around with to make the god of profit happy again. Profit is baked into all of our minds as the only measurement of correctly managed logistics, of success itself.

It's no longer a question of whether supply and demand can be automated to the nth-degree. It can be. It is right now. It's just that the spark kicking off a transaction is still the exchange of money. In today's business world an agreement to transact is activated by the exchange of money; when money moves, it's serious, it's happening. But could some other accounting system not based on money work? A big secondary question just got begged: Could your entitlement-reward-pay be allotted by something besides how much coin you've managed to skim off the giant ball of money we call the economy?

Today, your typical retail transaction triggers a mostly automated to-and-from logistics behind the scenes. When a retail store's POS system scans the barcode of your item, it alerts the underlying logistic system to replenish. (See the [Amazon Go](#) store for the state-of-the-art in logistics automation.) This process once involved great beehives of salaried people matching logistics to accounting ledgers. But does a modern, automated, computerized logistics system ultimately need to sync logistical movement to money accounting?

Computer networks in their natural state are not monetized. They have no hard- or software gates where a payment must be made for a batch of data-laden electrons to continue. Computer networks are simply networked. And as more and more of the economy is handled by computers, less and less money will be moving through that system. Human interactions, however, are typically monetized. For us, goods provided and services rendered typically involve an exchange of money. And yet when seen this way—humans always requiring money to be commercially networked—we seem behind the times. Imagine a nightmare where you are in your own home, but every room is infested with demon gatekeepers and goblin merchants who all want payment—to go down the hallway, to use the bathroom, to go to the kitchen and get a bowl of cereal. And as the dream progresses, the demons seem to gain control and ownership of anything and everything, constantly extracting payments, fees, rents. Things devolve to the point where nothing can happen in a natural manner. Although not explored, this is probably how the “operating system” Samantha in the movie *Her* saw the human economy. . . . In some future Man-versus-Machine scenario, Machine will invariably notice this bottleneck and seek to widen it.

But the social psychology might not be so simple. Can we trust computers to “just do it” for us—to make things, to move them along supply chains, and then dispense them against (perhaps only a vaguely understood notion of) a customer's algorithm-derived “valued involvement” in some other part of the network? I'm dreaming of the day when I'll simply walk into an Amazon Go-like store and take what I need—all because the sensors know I'm a part of N10422B, that is, Network 10422B. Something will beep and a guard may step

in front of me if I try to take something N10422B hasn't made eligible for me. But that would be so gauche—of me, of them. . . .

How did I become a node, a vertex of N10422B? Simple: I'm involved with N10422B enough to warrant my levels of consumption. If the economy is just one big network-graph, that is, vertices and the edges connecting them, then I'm a vertex with a certain "edginess," which entitles me to things, stuff from all the vertices with which I've supposedly *got edge*.

And what is my personal vertex of the net-graph? Let's imagine I'm involved with "raiding" certain car parts manufacturers. Since all processes (née businesses) net-graph-wide are open-source, I'm allowed to "fork" a car parts' logistics and then merge my improvements—if they're proven to be improvements and not more trouble than they're worth. The bottom line is, of course, doing more with less. If you can help Factory A put out better widgets with less resources per unit, with better *afterlife recovery* (read recycling), you, and by reverb, your network move up a tick. And as all the Star Trek experts are saying, your basic goods and services are pretty much a freebie—what with all the TC replication—while the choice stuff would indeed require diligence and expertise to win. So if I want the "really good stuff," I'll keep forking and trying to merge my improvements on bigger and more important sub-networks.

How would we decide who gets "more?" How do we evaluate success on such a huge, networked electronic barter system? It should be obvious that if I'm involved with a successful supply-and-demand phenomenon, such goodness should be duly noted and rewarded. Specifically, if I bring a logistical improvement providing "more with less" to some car parts input-output, I should be entitled to a—yacht, a beach house, a fancy mausoleum when I die. Simple: If network input-output improves, the contributors to improvement are rewarded *accordingly*. Nothing really new here.

But define *accordingly*. Okay, the first level of arbitration would be the actual data, as analyzed by open-source algorithms. However, if that doesn't satisfy, there are always lawyers. Clearly, arguments over advantage will not go away.

They account for the majority of lawyering today, and that holds for any foreseeable future as well. *Lawyers? No way!* Yes, think about it: No Utopian society has ever made free love work for very long, nor will any conceivable future society not have consequential arguments over advantage and disadvantage. So yes, that means lawyers, judges, arbitrators, politicians all involved in the inevitable fights over stuff, issues. But it should all get a lot easier without the distortion field of money, i.e., when the real data, the real code managing that data can be eyeballed by everybody.

What sort of work will the average person perform? Sure, aggressive forking and merging—all manner of knowledge work toward system improvement—will be of great importance; however, lots of people “downstairs” will have important roles with the follow-through of a successful system upgrade. For example, recovery, recycling, and the general business of putting more-with-less into action will be a big employer. But as we progress, more and more of these details will be automated, which means more and more people can simply be creative, helpful, *good* for a living. If you can show demand, use, attention, *love*—of any sort—you’re a winner, and, thus, you’ll “get edge” in a world where what we now call work has been largely obviated. For example, being a YouTube star is already based on this sort of metric.

What? Reward based solely on attention, love? Yes, yes, yes. Even today Great Britain’s entertainment sector dwarfs their nittier-grittier industries like coal and agriculture. Britain doesn’t do coal anymore, they do fashion, movies, TV, books, soccer—performance, show. And think about all the “make work” employment we’ve seen for decades in Western social-democratic societies like the Scandinavian countries. That’s only going to increase. Look around you. Lots of people with undecipherable job titles are getting paychecks for what previously would have been considered questionable contributions to any sort of real-world bottom-line. We’ll have to deal with this arc. As we get closer and closer to *TC-Endrationalisierung*, life will seriously change, probably more drastically than humans have ever seen before. A huge chunk of society will become an idle aristocracy of sorts. This is why I like to watch all those period films depicting the wealthy and aristocratic. In general, figuring out the future is

why we watched and studied *Star Trek* and all the other worthy science fiction. Sci-fi becomes popular based on its perceived ability to portray the future. And for me, any hint of how we will deal with the end of the ol' grindstone, the overhaul of the rat race is like Hansel and Gretel finding those breadcrumbs in the forest the crows didn't take.

So today we have money, which is necessary to buy stuff—and there's nary enough of it, most of us would say. Money and profit don't work very well in our modern 21st-century world. Just think of all the people working long hours and just getting enough to scrape by. It's as if they've been dropped on a desert island with food and water for only one week. People in these conditions don't do much other than survive. They don't take risks. They don't innovate, create, dream. Money is the *corpus delecti* of our shortage world, shortage mentality.

But let's imagine a world where we could have anything, i.e., release our hidden aristocratic demand. What would we really want? Obviously, such a system would have to be ready to provide everyone with a level of prosperity typically seen with today's upper-middle-class. But logistically-speaking aren't we already there—at least in the developed world? What would happen if most things were stone-free? After the hoarders had all been put on anti-hoarding meds, no doubt there would still be a continuing demand for really nice stuff. But would that be bad? If the system were capable of providing everyone with really good stuff, *why the blink not?* Think about it: The majority of high-quality things are not that much different from their cheaper versions when you look at the raw materials input. The differences show up in the less quantifiable column: technology, know-how, design, attention to detail. So often cheap stuff started out as good stuff, but then bits were *taken out* or intentionally made worse. For example, take a look at Danish [Vitsoe](#), the très chic boutique for modern designer furniture and modular shelving. Now, what if Swedish mass-producer Ikea upped their game to be on par with their Danish neighbor? Sure, slightly better materials would be necessary in key places; but everything else would be a straightforward upping of concept, design, and follow-through. To be sure, this sort of upgrade has been the arc of industrialism from day-one—better and better, cheaper and cheaper, more and more efficiently.

You can see this intentional cheap problem in cars, restaurants, housing, et cetera. So if the distortion field of money were suddenly gone, why would anyone continue designing, building, flogging cheap crap with intentional inferiority and planned obsolescence? Or, for that matter, why would anyone need to withhold new technology? Just doing away with the stocks and bonds markets as our go-to retirement ATM machine would free up the major vertices to implement potentially risky new ideas and technology as they come down the pipe. Let's rephrase this: How much time and effort is wasted playing the money game rather than innovating and creating? And no, old-style East-block communism isn't around anymore to gloat over with our relatively paltry amounts of innovation we do manage to drum up.

With Direct Logistics, supply and demand, input-output would take on a vastly more realistic role in the economy—in fact, input-output will be the only economic metric. DL asks very directly, Does what you are doing have real, quantifiable demand? Then it asks, Can all this activity, production be covered, resource-wise? Let's face it, money only distorts these existential issues—very badly, actually.

DL would necessarily be based on totally open resource data. All data, all algorithms would be open to scrutiny. For example, if we can't all have a Tesla Model S, then the data on the raw-materials and manufacturing capacity should say why. Open data equals suspicions minimized. And the DL version of too many people chasing too few goods would be a simple “back order” pop-up on your screen—along with all the detailed data of why and what's being done about it. Money, on the other hand, falls on its sword, self-destructs. It's called *inflation*—and it has to be the craziest, stupidest way imaginable of handling a supply-and-demand imbalance.

Resource allocation

Entropy doesn't sleep, and the one species that tends to accelerate it, namely, us, can't stop trying to learn ever better ways to surf entropy. Energy would be

an obvious system-wide standard or touchstone. This was originally proposed by the *Technocracy movement* of the early 20th century. I'd say yes to energy and add entropy surfing as its twin or superset. Again, the "budget" would be the actual physical resources and the human ability to transform resources into goods and services with minimal environmental impact and entropy acceleration. You can't get any realer.

Unfortunately, today's money-based economics pumps out a blinding fog, especially about base resources. Consider limited, non-renewable crude oil. How much is there? We don't know! because if we did, that would probably bring pricing more in line with the actual geologic supply—which would result in inflation, since every day there would be less of it (ca. 90 million barrels) than the previous day. Today, oil is priced by the nebulous concept of availability. So if we never face oil's actual geo-supply, we can keep on pretending it is endless, which, in turn, allows the price to stay relatively flat. Why is this so important? Simply put, money-based economics is predicated upon an endless supply of forever-cheap base resources. How else could the value-adding layers make their price points if what's under them is constantly, drip-drip-drip, rising in price? Bottom line: Money doesn't really work that well as an economic information or coordination device. . .

. . . and yet we can't begin to imagine life without money. Maybe you can—if you follow what I've written so far. I came up with DL because of a happy convergence of something Lenin said, what I saw in East Germany, and what people were saying about Star Trek, but seriously, I can't imagine how we will actually get there from here. Money is already grossly abstracted, what with every major currency floated, i.e., no longer based on anything other than some relative worth to other currencies. But what will happen when fewer and fewer people have good income, and all the while science and technology keep churning out the automation, robotization, and nanotechnology breakthroughs?

Let's imagine a breakthrough in the automation industry itself, for instance, software that would allow software to write itself without need of human programmers. Of course artificial intelligence has been chipping away at just this

nut for decades. But if we ever truly get somewhere with *metaprogramming*, what would happen to all those programming jobs at, say, tech-giant Microsoft? Software is already a shining example of Jeremy Rifkin's *Zero Marginal Cost* idea, i.e., you have the initial costs of writing a commercial software app, then once it's done you just make electronic copies and sell them. But if software could write itself, you've just stepped the overall cost back even further—if not all the way to zero total cost. This would clearly spell a drastic reduction in Microsoft's payroll. As I said earlier, we are already moving into a world where machines are exchanging electrons, rather than people exchanging money. . . . I'm not stating anything new here, I'm just focusing on the stark reality arc of less and less paid human involvement in the economy. Simply put, humans running on paychecks cannot compete with machines running on electrons. At what point will it be dead obvious that money is over? When Microsoft is comprised of only a board of directors, a CEO, and a CTO? When the 1% and their 25% minions shrink down to 0.0001%/2%?

I predict the so-called wealthiest 1% will get richer and richer, and rest of us will be getting less and less. No great crystal-balling there. But this is not happening because of labor market manipulation, or stock market tricks, or greed and avarice, rather, because rationalization is obviating the human being. And so I ask, when will it seem crazy, ludicrous to keep giving more and more money to fewer and fewer people—all while penultimate automated systems are producing goods all but human-free? Money once made sense when profits covered materials and salaries. But when nearly everything is being done without human involvement, then what? Will we know what to do? At some point we will have to chose DL, or we will fail as a species.

I've said a lot here. I'm describing a totally networked system where a citizen simply jumps in and tries to create demand—any demand for anything—within resource-based reason. If you can do this, you win. And even if you can't be a vertex-edge superstar, you still will have a good life. But first we'll have to overcome the shortage mentality and learn to think outside the millennia-old money-box. And yet at some level we all sense, we *know* money and profit simply can't handle what is happening, what is trying to happen these days. It's

dog-plain we can't continue toward total automation *and* be in a currency-based, artificial-shortages economy. We will have to trust a system based on massive amounts of information coursing wildly about the planet, open and transparent, yet largely beyond any single individual's comprehension. A change toward some sort of Direct Logistics is coming. I just hope we can do it sooner than later.