

The Great Simplification

Nate Hagens (00:00:02):

Welcome to Reality Roundtable #3.

(00:00:35):

We don't think about it too much, but there are approximately 240 million college students in the world. Many of them are exposed to economics 101. It is my belief of study over the last 20 years that what is being taught in economics is not commensurate with the biophysical world, the socioeconomic realities that we face.

(00:01:06):

With me to discuss conventional economics as it's being taught and heterodox economics that is trying to apply human behavior, natural sciences and reality to the field of economics, are four previous guests, all friends of mine. Josh Farley, and Jon Erickson of the University of Vermont, who were both on my PhD committee, Kate Raworth of Donut Economics in London, and renegade economist, Steve Keen, currently in Amsterdam, but traveling all over teaching the reality of money, energy and climate, and economics. This was a fantastic conversation that I hope can be shown in colleges around the world to get a glimpse into the disparities from what is being taught and our current reality.

(00:02:06):

Please welcome Kate, Jon, Josh, and Steve.

(00:02:22):

Welcome to Reality Roundtable #3.

(00:02:27):

With me today are four of my colleagues and friends. Jon Erickson and Josh Farley were my PhD advisors, Steve Keen and Kate Raworth, heterodox economists, self-described both of them as renegade economists. They've all been on this program before and have great episodes you should listen to.

(00:02:52):

The framing of this conversation is on economics and education. There are currently around 250 million young humans at universities around the world who are learning about how our world works and their future and how things fit together. It's education. But economic theory has been relatively unchanged in the last century and may not be preparing these young humans for the reality that is our ecological systems connected world.

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(00:03:33):

I have asked each of our four panelists today to highlight one area in economic theory that is being taught in a way that doesn't represent our biophysical ecological systems reality and how that might be rectified. We're going to have six minutes each and then ask questions and then open up to a broader conversation after all four have gone. I'll just briefly introduce the topics so we know where we're going.

(00:04:08):

Jon Erickson is going to talk about Homo economicus and the microeconomic treatment of human behavior and why that is relevant.

(00:04:19):

Steve Keen is going to talk about the importance of energy that is missed in macroeconomics currently, and also what that implies for the treatment of externalities, climate change, et cetera.

(00:04:35):

Josh Farley is going to explain the assumption that markets are the most efficient mechanism for resource allocation and why that is a flawed view.

(00:04:49):

And Kate Raworth is going to wrap up talking about the big picture economy that goes beyond just GDP and measuring the monetary representations of our system.

(00:05:02):

I'm very excited to be here with you all. I think let's just get right into it. Jon Erickson, professor at the University of Vermont, please kick us off.

Jon Erickson (00:05:17):

All right, well thank you, Nate. Thank you for organizing this and it's so nice to see you all.

(00:05:24):

Yeah, I'll start with a morbid thought. I think it was Paul Samuelson who said, "Change does happen in economics, but one funeral at a time." So it's been slow. It's been very slow-going, and economics has held on to some pretty core thoughts that emerged in this so-called neoclassical era of economic theory. Really, that was born in the late 1800s. So it's been a long haul. And what you asked me to talk about really is the core model of behavior that we find in economic theory. What we did in economics is we

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took the tiniest slice of human behavior; self-interest, and then we wrapped it with abstract mathematics in the late 1800s, and big chunks of our economic theory has been there ever since. This theory of the self-interested individual wrapped in mathematics is built from the sanctity of the personhood and it's kind of all set up to guarantee market equilibrium, which our colleagues will get into some more.

(00:06:42):

It's also over the course of the last hundred plus years, a theory that has largely been walled off from other disciplines while growing in influence and in stature in academia, infecting public policy, business administration, infecting the other social sciences, and even in more recent years affecting the natural sciences. When its assumptions, which I'll get into, are challenged or when the theory of the rational actor, the self-interested individual, doesn't hold up against other theories or other disciplines or when the scientific method gets in the way, economists have this very convenient line. "It's just a model." Or they often quote George box, the statistician. "All models are wrong. Some are useful." But I would add one little more piece to that. All models are wrong. Some are useful. I agree. Useful for whom? And that's the big question that we need to ask today.

(00:07:54):

Let's unpack this rational actor model. It starts in such a simple, seemingly innocent place. There's this intelligent human, this intelligent individual, who makes logical decisions for him or herself. Sounds like a laudable starting place. So intelligent, individual, logical; it sort of implies that anything else is dumb or illogical or naive, and ignoring the instinct of self-interest. What economists for a long time have called any challenges to the starting point behavioral anomalies.

(00:08:38):

This idea of a rational actor starts with the actor, the individual, an isolated individual, at a point in time. That's the kind of first divergence that we need to consider. And Nate, your work has really highlighted this. When we start with the isolated individual at a point in time, we're ignoring the evolutionary history of our primate species. We're turning Homo sapiens, Latin for wise man, into Homo economicus, this hypothetical person that maximizes utility as a consumer and maximizes profit as a producer.

(00:09:21):

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But anybody outside the constraints of an economics 101 class will tell you that Homo sapiens is a member of multiple groups with evolved instincts for care, compassion, empathy. Yes, we have an ability to compete, but we also have an ability to cooperate. And that expression of those behaviors; compete, cooperate, selfishness versus care really depends on our environmental cues. Depends on our culture. Depends on our institutions. It depends on who's designing the rules that brings out that expression of the human being that ultimately answers useful for whom. All models are wrong. Some are useful. Useful for whom? And if we set up this kind of caricature of the human so that it's useful for only certain people or only certain classes, we can quickly get to the conclusion why this very narrow model of humanity has hung on for a hundred plus years.

(00:10:24):

Rational actor model. The actor; the rational part. Okay, this rational agent needs a decision rule. Again, it starts in such a simple place. How we make decisions is at the margin. This rational actor model to be rational, to be logical, we should just consider the next choice. And if the next choice creates more benefits than costs, then do it. Such a simple, simple decision rule.

(00:10:57):

Josh and I went and did our PhDs together at Cornell University, and I can't speak for you Josh, but all I learned throughout my PhD was marginal benefit equals marginal costs over and over and over and over and over. Any sort of decision was framed as marginal benefit equals marginal costs. So all you got to do is consider the next unit, count the benefits, the next unit, count the costs, and there's your decision rule.

(00:11:21):

And in fact, through economics education, we're sort of trained to think at the margin. We're trained to think like an economist. One of my teachers at Cornell was Robert Frank, and he talked about economic naturalism. This idea that thinking at the margin is sort of the highest logical, rational way to think. But it turns out that people aren't so good at the calculus of variations. People aren't so good at thinking of the margin. We use a lot of cognitive shortcuts because we have information overload. There's a great video by this standup economist, this colleague from the University of Washington, who sort of pokes fun at this idea of thinking at the margin.

(00:12:13):

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We have lots of tricks to make meaning out of information overload, like what information we manage to absorb. We have lots of shortcuts and lots of tricks. For example, the normalcy bias. We are terrible at interpreting probability as human beings. The illusion of asymmetric insights. We are terrible at guessing what others are thinking. There's the hindsight bias. We are terrible at predicting the future because we sort of think back in hindsight.

(00:12:47):

All this kind of makes the rational actor model a terrible predictor outside of the most simple decisions. And when you add other kinds of biases, like mental shortcuts to act fast in the face of uncertainty, there's overconfidence bias, ego-centric bias, optimism bias, novelty bias, there's all these biases that economists conveniently call behavioral anomalies that we assume away and kind of come back to this core model. And it is sort of the main reason why so much of our economic models are terrible at predicting microeconomic behavior. And then when you add all those things together, they're terrible at predicting macroeconomic phenomena. Maybe I'll just end there.

(00:13:34):

The IMF did a study recently and looked at 153 recessions in 63 countries between 1992 and 2014, and found that the vast majority of economists miss them all together. Why is this? Why is economic forecasting so bad? Maybe part of it is that economic forecasters themselves are humans. So we have difficulty in imagining low probability, high-impact events, but it's also because this rational actor is built into the very models that were used for these predictions. And in these rational agents in these models assume that we absorb new information seamlessly, that we predictable response to price signals, that we quickly move back to full equilibrium, full employment. The list goes on and on of why these models don't add up and why we need what I call a more conciliate economics, and we'll get into that perhaps as we unpack this some more.

Nate Hagens (00:14:35):

Thank you so much, Jon. It's interesting for me to be running the Committee of Economists as opposed to you back 12 years ago. I have a question and then we'll kick it off to the panel.

(00:14:50):

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You talked about Homo economicus and what is taught with rational actor. Does what's being taught to young humans end up changing our behavior during this period en masse?

Jon Erickson (00:15:08):

Yeah. When our institutions and our public policy are informed by the self-interest model, we craft institutions and cultures and public policy that draw out that selfishness, that draw out the greed, is good behavior, that draw out this expression of the human animal. So it is the chicken and an egg, right? If you believe we are selfish, we therefore create institutions that draw out our selfishness.

(00:15:34):

In the classroom, there's a lot of evidence to show that with enough training, with enough brainwashing, with enough kind of deprogramming the human animal to think at the margin, to think rationally, to think selfishly, to think like what Thorstein Veblen called a homogeneous globule of desire, that we start to behave that way. And given that economics, business, political science are the most popular majors, at least in American universities, and given that economists, political scientists, MBAs go on to lead our institutions, our political institutions, our private institutions, even our nonprofit institutions, then you start to get into this kind of self-fulfilling prophecy, which is what you're referring to.

Nate Hagens (00:16:26):

Steve, Josh, Kate, who would like to ask Jon or interject on this topic?

(00:16:31):

Josh, you first, then Kate, then Steve.

Josh Farley (00:16:35):

Yeah, I just want to comment on one thing. A lot of people in evolution used to say, "Well, nature is red in tooth and claw. Everything is competition." And yet evolutionists are recognizing that cooperation has been the secret of human success, but also one of the driving forces in evolution. And based on readings in evolution, I asked all my students to name five characteristics of a good person and five characteristics of an evil person. And inevitably, a good person puts the group ahead of the individual. Some anthropologists actually did a study, a global study of what elements of

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morality are the most universal, and it is first of all, cooperation and putting the group ahead of the individual.

(00:17:19):

So these are actually universal phenomena, and it seems really weird that economists define humans as basically evil, but it is true. And Robert Frank, your advisor, has done a lot of research on this, showing that just being exposed to mainstream theory does make economists think far more like Homo economicus.

(00:17:42):

I always ask these students, five characters to a good person, I presented to the University of Vermont Econ Club, hand shoots up, and says, "Selfishness." That was a good person.

Jon Erickson (00:17:54):

As you know, Josh, and others, that Charles Darwin was writing at a time of the classical economist, and they were actually trading a lot of ideas back and forth. The big difference is economics got stuck. It got mathematized. This marginal revolution took over, and economics sort of stayed rather static throughout the 1900s while evolutionary biology, the natural sciences more generally, became more conciliate, became more connected, became more interdependent, became more about seeking truth through collaboration instead of through isolation. And so it evolved while economics got stuck.

Kate Raworth (00:18:33):

I'll jump in with a devil's advocate.

Jon Erickson (00:18:35):

Please.

Kate Raworth (00:18:37):

Okay, you say this model is wrong, it's not good enough. Then what? I think this is one of the big push-backs. Well, then what? Of course, we know this model is a simplification, and so we can relax each of these assumptions and see how this might change. So then, what kind of modeling? If it's supposed to not be derived by putting together a set of assumptions that work for maths, then where are you going to get

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your model or your representation of humanity from and how will that change economic modeling?

Jon Erickson (00:19:10):

Well, I'd start by aligning economics with science and ethics. And that's where economics started. Economics was a moral philosophy. Its roots were and moral philosophy. And creating what I like to call more conciliate economics and economic theory in particular, that tests itself against theory of other fields. I think that's where economics has gone astray. This litmus test that in my mind comes from the work of E. O. Wilson and his book *Consilience* in 1998, is the test of a good theory is how well does it hold up against all other theory? His advice to economists was to look at the borderlands. Look at the borderlands between economics and other fields.

(00:20:01):

Here in the borderlands, I think you find a richness, a tapestry to rebuild a study of economics that is scientifically credible and ethically virtuous. So the borderlands between economics and neuroscience, some call it neuroeconomics, where we're almost on a daily basis overturning the assumptions of economics based on empirical database science. The borderland of behavioral economics really at the individual level. The borderland of experimental economics, like testing our ideas with groups of humans interacting with one another. The borderland of institutional economics, groups of groups working together and testing ideas of competition versus cooperation. And what are the institutional characteristics that draw out those expressions of human behavior?

(00:20:52):

And the borderlands of evolutionary economics, the kind of long view of why is it the humans think and act the way they do to really build a true decision science? I mean, economics builds itself as a decision science, and in my view, it has become anything but.

Steve Keen (00:21:11):

Yeah, I actually am a bit like Kate. I'm a little bit of devil's advocate here, but a different direction.

(00:21:16):

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Jon, the critique you've given on neoclassical economics is the one I'm happy with. I've seen plenty of neoclassical economists sit through a presentation by someone in the behavioral economics and say, "Oh, there's this bias and that bias. I'm just going to assume rational behavior." Okay? The real weakness of that theory is that it doesn't work internally anyway. If you look at the theory of how they try to derive an individual demand curve, that's quite straightforward. Students will be dragged through deriving what they call a Hicksian compensated demand curve, which necessarily slopes down sometime in their first year. The poor bastards. And they will then gloss over how do you convert that to a market demand curve?

(00:21:52):

Now, the mathematics has been done by a decent mathematical economists, Sun and Sean Schaeffer, and quite a few others, and they proved, not that they wanted to prove, that if you have an entire community of individuals with that downward slope, and you keep seeing Hicksian demand curves derived from the assumption of rational behavior, utility maximizing behavior, the resulting market demand curve at any shape at all, that it can be represented by a polynomial. It doesn't have to slope down.

(00:22:18):

Now, they don't teach that. They end up assuming that the representative agent. The representative agent is a single individual consuming a single commodity. Most people they don't realize it's a single commodity. If you allow either more than one individual with different preferences or more than one good with different characteristics, you cannot no longer derive a downward sloping market demand curve. That's the real flaw with the theory.

(00:22:46):

That's the critique the students need to realize. I've actually recommended to go and read a paper by Samuelson. And by the way, it wasn't Samuelson who said, "Science advances one funeral at a time." It was Max Planck. He was quite right about science. Science does advance one funeral at a time because, ultimately, you have generational change. New groups come along knowing the anomaly that the previous physics didn't cope with. They replace the professors who can't admit the anomaly. Bang, you get change.

(00:23:12):

In economics, you can always find a couple of zealots who love the anarcho, cynical, libertarian nature of neoclassical theory in that we all got what we deserve. We've

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reached utility in maximizing. We're an equilibrium. What a wonderful society. It's even better than Scientology. I'm going to convert everybody to join my religion.

(00:23:32):

So you don't get generational change in economics. And that's what we desperately need, which is why we're talking to students today.

Jon Erickson (00:23:39):

Yeah, yeah. Absolutely. Samuelson admits that he stole that from Planck, but he was applying it to economics. Planck was talking about science more generally.

(00:23:54):

Another idea of interpersonal utility comparison, like comparing my utility with yours is not allowed in economics because if it was the whole edifice of welfare theory falls apart. There's some real challenges to the core assumptions of economic theory at micron, macro levels.

(00:24:15):

Your thought on the representative agent. So much of our growth models are built on a representative agent. So many of our climate economy models, this is where it gets really dangerous, are built on a representative agent. The entire climate system from the perspective of one individual who's trying to maximize utility. That's the edifice of the entire William Nordhaus framework that won a Nobel Prize, that really informed particularly the US position way back in the early '90s under Bush I of wait and see, because we shouldn't rationally do anything now in order to incur near-term costs with the potential for long-term benefits. This philosophical view of economics builds the whole edifice.

(00:25:04):

And this is where I have a challenge as an economist with I'm okay with economists in the role of tinkerers, as mechanics, as janitors, applied economics twiddling at the economy to make it work better. What I'm not okay with is economists and economic theory as it currently stands as master planners, as the master narrative. And that's where I come at this.

Nate Hagens (00:25:28):

Excellent. That was a great 20-minute overview of microeconomics and Homo economicus. Granted, each of these topics we could spend two hours on, but I just

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want to have a real bird's-eye view of some core things that we're teaching young people around the world right now that really don't hold water.

(00:25:50):

Next up, I would like to switch to Steve Keen. Steve, what aspect of modern economic theory would you like to debunk today?

Steve Keen (00:26:01):

Mine is going to be energy, the role of energy. So the chart you can see on the left-hand side is using, it's the new software I've developed called Ravel. And if you wanted to find a tighter pair of items that are correlated with each other, you'd be having a pretty hard time to find it. The black line there is GDP and the colored line is energy. And the fit between the two is ridiculous.

(00:26:26):

There's obviously some correlation of two factors going in the same direction that it reach a correlation prohibition of 0.997. But if you take a look at the one below, which is looking at change in that energy and change in GDP, so no longer any problem about spurious correlation from both going in the same direction. The correlation there is 0.86 and energy goes up, GDP goes up. When GDP goes down, energy goes down.

(00:26:51):

And if you're trying to derive an empirical model of production from this data, your first pass would be that at a first level of approximation, GDP is energy converted into useful work. That's what you draw from looking at the data like that. Now, if you then would say, well, what economic theory currently suits that? It's actually what's called the Leontief model, shown in a different fashion showing a fixed numerical relationship between capital, however it's defined in GDP, however it's defined using what's called a capital output ratio. But I've actually shown in my research that is in fact the efficiency with which machine returns energy into useful work.

(00:27:32):

So that's the post-Keynesian theory and it fits the data like a glove and you wouldn't bother doing anything else if that's what you knew. And neoclassicals reject this empirical fact because it conflicts with neoclassical theory. And there's a recent paper that I'm going to have a bit of fun with here, which said if the elasticity of substitution between down and energy and other inputs literally zero, then production falls one

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for one within an issue supply. And as you can see from the previous data that I showed, that's the truth. That's what actually happens.

(00:28:03):

Now they then continue to trash the model that post Keynesian's use to model production called Leontief production and they say it makes nonsensical predictions with regard to the evolution of marginal products, prices and expenditure shares. Yeah, but it's true. So there's got to be something wrong with the idea of marginal products, prices and expenditure shares and that's what turns up. So this paper, they go on to say the Defactor prices equal marginal products and that's the neoclassical theory of income distribution. The wage equals the marginal product of labor. The rate of profit equals the marginal product of capital. Therefore, in both cases you get what you deserve, which is why there's this meritocratic side to neoclassical theory that I think is a major reason why people get seduced by it.

(00:28:45):

Now he says, if that's the case, if the substitution is one for one, which it is, then you get nonsensical predictions about these ideas. What that implies is that it's not the predictions that are nonsensical because the prediction is actually true, a one for one match between energy and GDP. It's the theory that's nonsensical. So this is actually what a classic owned goal. They used it to trash the idea that there was a one for one relationship between energy and GDP, but you find there actually is a one for one relationship between energy and GDP. So the only way to make sense of this is that this is a disproof of the neoclassical theories of both production and distribution.

(00:29:32):

And that's one of the danger that Jon alluded to a moment ago, that those models have then blinded us to the dangers and the importance of climate change. So if you take a look at how they modeled, but I'm not going to ... Well the name of the model, you'll learn it soon enough, you poor victims of a neoclassical education, the Cobb-Douglas production function, and that shows production as involving technology, which they label A, L for labor and K for capital. But there's exponents of labor and capital, which I've already shown in the previous slide, must be wrong empirically, but that's what they use and they have no energy input.

(00:30:06):

Now that's one reason why Nordhaus back in 1991 could write a sentence like this and not realize that he was being a blithering idiot, which is what unfortunately an

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economics degree turns you into. He says for the bulk of the economy, manufacturing, mining, utilities, finance, trade, by which he means wholesale and retail trade and most of his industries, it is difficult to find major direct impacts with the projected climate changes over the next 50 to 75 years. And that ignorance is what set our climate policy ever since.

(00:30:38):

And you've got the Nobel Prize, which I hope you'll soon check and see why I've got Nobel Prize in inverters commas there. It's not a Nobel Prize. So when you look at the neoclassical consensus that's been formed, starting from ideas like Nordhaus's 30 years ago, here's a paper that surveyed over 2,000 economists who've worked on climate change. By the way, it's about two to 3% of the total population of economists so it's not the entire body of economists who produced this nonsense. But of that group, they surveyed 2,000 to 100 roughly. 750 roughly replied and they answered that they thought if you're going to head towards five degrees warming by 2130, so another four degrees in the next century and another six degrees in the next two centuries to seven degrees Celsius by 2220, that would reduce economic growth by 0.02% per annum.

(00:31:32):

Now that's less than one fifth the current measurement level for recorded GDP growth today. We'd never report GDP growth as anything other than X point Y percent. However, point Y is 0.1 the units of 0.1 of a percent. And here with this lot trying to predict that global warming would have an impact on GDP growth, which was one fifth level of measurement error for recorded GDP to go. In other words, it doesn't matter.

(00:31:58):

Now the reality of energy is something that I realized when working with Bob Ayres some time ago, and that is that labor without energy is a corpse. Capital without energy is a sculpture. Neither labor nor capital can do anything unless you put energy inputs into them. And when you do, energy is by far the dominant factor of production. And the ignorance about this is critical in the case of global warming because this is what causes the belief that damages from global warming are going to be so minor.

(00:32:25):

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Now you talk to scientists, if you tell them the levels of economists blindly discussing seven degrees by 2220, this is from a paper in 2017. The range of science papers you can find like this, describing more than five degrees of warming is unknown, implying beyond catastrophic, including existential threats. And here are economists saying it's going to cause a 0.02% fall in the rate of economic growth. This nonsense has dominated how a form following policy on climate change. This is closer to reality. Reality is about to trump theory at our monumental expense.

Nate Hagens (00:33:03):

Thanks so much, Steve. So if there was a standard economist watching this program, what do you imagine their rebuttal to what you just said would be?

Steve Keen (00:33:18):

They're most likely to throw that there are national exceptions to that data I showed you a moment ago and you can find them. So if I actually share my software this time, I can actually illustrate that. Let's see if I can just do that. Hang on a second. Go back to share again and I'll share this screen. Okay, so can you see my Ravel data there? Okay. Okay, there's the world. If I move to United States, you find the GDP is increasing, energy consumption has been going down since 2000.

(00:33:56):

You find the same. India, on the other hand, accelerating use of both energy and GDP growth. Great Britain, dramatic de-linking. Look at that decline there. China, rising use of both. So what they focus on is country exceptions, but the thing is that's using globalization to obscure reality. When you look at the overall globalized economy, you get the result I can show you there, virtually a one for one fit between the two. So I'm sorry, there's something wrong with your theory and there really is no comeback to that.

Kate Raworth (00:34:29):

Staying with that picture, I just want to double check. So I'm going to do the pushback from the economist, but were you showing us national production energy consumed within the nation or are you showing consumption-based energy?

Steve Keen (00:34:44):

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It's primary energy. The data source is the OECD. So it's a primary data source using the OECD. So it's not consumption, it's the overall use of energy to produce GDP globally.

Kate Raworth (00:34:57):

If you did those calculations on a consumption basis, then you wouldn't see anything like that scale of decoupling. You might still see, in fact there are some countries that appear to have decoupled on a consumption basis, but you wouldn't see that.

Steve Keen (00:35:12):

That's right. And so what you've really got is that, again, the theory is rather than illuminating reality, it's obscuring reality and that's the real danger of a neoclassical education.

Kate Raworth (00:35:20):

Can I ask a question though, and I don't know if it's of Steve, I'm going to ask you to lean into your least cynical of the economists who you've spent your career surrounded by. How is it that economists could conclude that up to five degrees of global heating over a century could have a minimal disruption to ... I mean, where is the disconnect in the science, in the respect for other science, the lack of consilience, as Jon would say? How do you believe they've actually come to that conclusion?

Steve Keen (00:35:58):

If you get inculcated in neoclassical way of thinking, and I can say from my own experience up to the halfway through first year of microeconomics at Sydney University when I was 18, I swallowed all this stuff. And what it gives you is a paradigm as Kuhn put it, that lets you see the world. And a paradigm doesn't just, paradigm does several things. It tells you what's worth looking at. It also tells you what's worth ignoring. So when you're wearing that paradigm, you get a very coherent view of the world because it's the paradigm you're seeing, not the real world.

(00:36:28):

Now if any elements of the real world conflict with that paradigm, and I'm not blaming economists for this, this is very much human nature and it comes back to the facts that Jon was talking about earlier and Josh as well, that we are a sharing and collective belief sharing species. If you find stuff which conflicts with your belief, you

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shut a blind, you turn a blind eye to it. And the classic there comes from Galileo. Galileo wrote to Kepler, one of my favorite pieces of correspondence ever saying, "What are we the same idea, Kepler, about these learned gentlemen at the university who with the capacity of an ass, refused to look through the telescope."

(00:37:05):

Now what Galileo had done is invent the device that enabled us to see objects at great distances much closer up. You would think that scientists would like to see the spheres. You could finally see the spheres. Only they knew that if they looked through that telescope, they wouldn't see the spheres. They would instead see moons orbiting Jupiter and Saturn, which completely destroyed their paradigm. They refused to look down at ... Neoclassical economists are no better than Ptolemaic astronomers at the time of Galileo refusing to look through the telescope.

Nate Hagens (00:37:36):

So I mean anyone in five minutes can on the internet look and see that a barrel of oil has 1,700 kilowatt-hours of work potential, which is years of human labor. So an economist is not going to want to look through that telescope because obviously that implies a much larger value addition than its cost share to the economic function.

Steve Keen (00:38:01):

Yeah. Look, I've had a lifetime of experiencing this in the sense that since I predicted the global financial crisis, one of about a dozen economists who did, and of course many more people that hadn't been blinded by economics did see it coming. So it's a look through your economic failing not to be able to see that the financial crisis is coming away in 2008. But I've been showing ever since then data showing credit, the change in annual change in private debt against unemployment with outrageously high correlation coefficients, again about the 0.9, minus 0.9 level between change in credit and change in unemployment, the level of unemployment.

(00:38:36):

And I've just given up. They will not look at it. It's outrageously different to what their theory predicts. I've shown it at numerous conferences. It's on thousands of websites and not a single economist has attempted to fit that data and see what's gone wrong with their theory. So the classic, this is the paradigm blindness of humanity. On that front, if you want to choose any rationality, Jon, that's the ultimate of all time, economists are irrational.

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Josh Farley (00:39:02):

I'm just going to make a couple of quick comments really adding to it, Steve said and answering Kate's question a little bit too, why are the economists blind to these things? How can they not see the problems of climate change? So Schelling, another Nobel laureate and Nordhaus has actually said the same thing. Schelling was more explicit. He said, "Climate change will only affect GDP." GDP is only one, I'm sorry. Climate change will only affect agriculture. Agriculture is only about 1% of GDP. So if we lose 30% of agricultural output, no harm done, which is completely insane. And then this idea about the importance of energy. I challenge anybody in this audience, what have they interacted with today?

(00:39:48):

Anything they purchased or any human made product that did not require oil. Everything we interact with require oil. And to give an idea of how valuable oil is relative to what we pay for it, think about how far you could push, how long would it take you to push your car as far as you can drive it on a dollar's worth of gasoline. And right now you'd have to multiply that work by 16 billion per day to see how much work we do with gasoline. And then so we treat it as even these models, we get rid of oil, no harm done, the economy will continue to grow at 2% forever. So these are just kind of crazy ideas and very easy in to visualize the issues.

Jon Erickson (00:40:32):

I spent some time thinking in the first section about marginal change, and I think the economists who are trained in marginal benefit is marginal costs over and over and over and over and over again. I mean, that's how we've built our climate economy models and we take the future and bring it into sort of near term marginal calculus through the discount rate. So all future costs, all future benefits brought back to a near term decision at the margin. What's the marginal benefit? What's the marginal cost? And that's what's infected these kinds of models.

(00:41:04):

But Steve, I would add it's infected the scientific understanding and modeling of climate change. The intergovernmental panel on climate change, something like 113 of the 116 scenarios that give us a 50-50% chance of staying within two degrees Celsius. Assume two to 3% annual GDP growth. At 3% that's a doubling of the world economy in 27 years. And they do this through magical thinking, through efficiency, through decoupling, through all of the stuff that empirically we can't show has happened or

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empirically will happen. So my biggest fear is that economic thinking really has, it's infected other social sciences like business and psychology and political science, but it's really starting to infect climate science where to be a climate scientist, you have to show the economic costs and benefits of your models.

Steve Keen (00:42:07):

Yeah. The IPCC is just too big to read as a consortium, but I've read over 1,000 papers, I'd say, behind the research for both the science and the economics, and I've read the economic sections of the IPCC in great detail. And they will say things like, this is the 2022 report saying that a four degree increase in temperature by 2100 will cause a 10 to 23, 23% fall in GDP relative to what it would've been in the complete absence of climate change.

(00:42:33):

And what that means is rather than being five times bigger, it'll be four times bigger. Okay. It's still positive growth. And if you look at how they do what they call the shared socioeconomic pathways, they are made using the components of the Cobb-Douglas production function. Technology is going to improve. There are going to be more people, there'll be more machines. Therefore, GDP is going to continue growing. So every one of the SSP scenarios, whether that's in the 2.5 to the 8.4, whatever they call them, they all, not one of them predicts any period of negative growth anywhere in the world for the next century. Now they're completely and absolutely wrong, and we're going to find that out very, very quickly.

Nate Hagens (00:43:10):

This all makes complete sense to me because I've studied this and I know the four of you and we've talked about these things and been dismayed and shocked about it. I wonder though, what people who haven't spent this amount of time on these issues thinks of this conversation. It is so apparent to me, these deep dangerous chasms in the logic of economic theory, which is leading our culture forward. I just wonder what the general person listening to this would think. Maybe we'll find out.

Steve Keen (00:43:47):

Yeah, though, I think that's what I ... I mean when I first read the neoclassical stuff, I was in shock. My wife actually came in when I was looking at some of it and shocked and broke me out of it with very tight Buddhist comments upon whether we can

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survive or not. And I was in shock. I mean, it was so bad because they are literally assuming that you're going to only agriculture is exposed to climate change. The rest of us work in carefully controlled environments that will be negligibly affected by climate change. That's 87% of the economy won't be affected because it's under a roof. And there's such ludicrous assumptions like this. I was just in total shock.

(00:44:23):

And it took me, even though I know that anybody who believes that can't understand climate change, it took me a while to realize that's actually the way that economists think about it. So once they just think only stuff exposed to the weather's going to be affected, they're going to get fertilizer effect offsetting some of the bad weather. So overall, ACDC is whether it increases or decreases GDP, and that's what the 2,000 of them continue bullshitting each other about.

Nate Hagens (00:44:48):

And in that climate controlled future, that air conditioning is going to need things to power it for more people, et cetera. Josh, you had a comment, then Jon, and then we're going to move on to the next piece.

Josh Farley (00:44:59):

Yeah, and just super quickly, what are the scariest things I think about this assumption of exponential growth going on forever. As Jon pointed out, the economy doubles in size every 24 years at 3% growth. That means anything we do today to mitigate climate change in the future is sacrificing our wellbeing for a richer future. And that would be stupid. Why should we sacrifice for people who be richer and better off than us? We should do nothing.

Jon Erickson (00:45:22):

I would just add briefly that economics has become the language of the ruling class. So your question, Nate, about the everyday person, right? If you're not part of the ruling class, then you're not speaking the language. I mean, ask the language of the ruling class. It really has been written in such a way to align with the ruling class for 100 plus years. And that's why we continue to hang on to these kind of myths of economics. And that's why economics of all disciplines on most campuses has become the most amoral and a-scientific and a-historical. So it's our job to kind of abandon these beliefs, rebuild an economics, and lean into other values. And I really think that's

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where the vast majority of the public is at to take back things. Words like rational, what does it mean to be rational? To think of the margin or to think about the health of the planet, for example.

Nate Hagens (00:46:24):

Thank you. Let's move on to our next panelist, Josh Farley. Take it away, sir. All right.

Josh Farley (00:46:32):

So what they always teach in economics classes is that markets are this amazingly efficient mechanism for generating these optimal utility maximizing equilibriums. So it's really, we'd be idiots to challenge this, and I want to make the case so first to explain why they believe this. So they say on the production side, markets are allocating labor, energy, raw materials, all those factors of production. They allocate them to the sectors that can add the most value. And because those sectors can add the most value, they can pay the most. So the market allocates the resources to them so this maximizes value on the production side.

(00:47:11):

Then on the consumption side, markets allocate all the commodities to those who value them the most is measured by how much they're willing to pay. So it's maximizing value on the consumption side. And then in terms of equilibrium, let's say there's some war on Ukraine or that disrupts oil supplies or food supplies. So economists say if a resource or commodity becomes scarce, prices increase. So producers supply more and consumers consume less. So we get the self-regulating equilibrium and then we measure our success using GDP. So a GDP grows, shows we're doing better.

(00:47:45):

And what I would argue is that economists, what we should pay most attention to is those essential resources, the things that we're dead if we don't have. And these are things like energy and food and healthy ecosystems. So this is what economists have to get right, is how we allocate essential resources. And I want to just show very quickly that markets are actually terrible at achieving any of these goals with essential resources. So I'm going to use the example of the market at essential resources of food and energy. And the idea is that if food becomes scarce, price goes up. So we demand less.

(00:48:26):

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But my physiological requirements, my nutritional needs are completely unaffected by the price of food. And so I don't demand less when the price goes up. So what happens if a resource becomes scarcer? We all compete to get it because we need it, which sends prices skyrocketing upwards. And this is why we just saw the food companies getting record profits last year. So the big problem with this demand is demand is actually preferences weighted by purchasing power. I don't have demand if I don't have money to back it up.

(00:49:01):

So the only people when prices rise, when food becomes scarce or energy becomes scarce and prices rise, the only people who reduce consumption are those who don't have enough money. So I did an empirical study looking at all the countries in the world, how they responded to food price shocks. And what actually happens is in rich countries, the price of food goes up. We don't notice at all. The price of wheat triples. We don't eat a single slice of bread less, we continue to throw 40% of our food into the garbage. Whereas in poor countries, they're slashing consumption because it's such a large share of their budget, they can't afford it.

(00:49:38):

So markets are actually allocating the most important resources to those who need them least. So rather than utility maximizing in some ways, in an unequal economy where we have huge differences in purchasing power, we allocate resources to those who need them least. On the supply side, we tell this story that is the price of oil goes up, just suppliers will produce more, but they forget to point out that for producing oil, there's about a two-year time lag between the time it takes to decide to produce more oil and then define the fields, drill the well, start producing oil.

(00:50:13):

And for food it's at least a year. So when prices go up, we'll get these huge investments. So when prices were very high for oil, there was hundreds of billions of dollars flowing into the fracking sector, which actually when output came online, it crashed prices. So it generated less revenue than was invested, which meant that the financial sector was essentially subsidizing the production of oil at the stupidest possible time. And what you have then is this prices today, or supplied today is really determined by prices in previous periods, which leads to this wild disequilibrium, up and down of ups and downs of prices which destabilize the economy. Really a problematic thing. We then measure our success based on GDP and GDP is the price

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times quantity of final goods and services. But when there was a small decrease in oil supply, in the '70s this happened, and with the Ukraine war we saw prices skyrocket. Small decrease in food prices, leads prices to skyrocket, meaning for essential resources the less we produce, the more they contribute to GDP, which is about as perverse a measure of welfare as you could possibly have.

(00:51:34):

So mainstream economists claim there's this trade-off between efficiency and equity that if we try for greater equity, we remove the incentives, the selfish incentives to produce more and therefore we end up producing less. And that's inefficient, but it's total nonsense. The more un-equitably distributed resources are, the less efficient our economy becomes. Inequality is probably the worst market failure out there that systematically allocating resources to those who need them least. And I haven't talked about the other obvious really essential resources, our nature's life support functions, which we are watching in real time being disrupted every day. I'm in Vermont, we've just had massive floods. We're having massive heat waves, breaking all sorts of records around the world. And markets either entirely ignore ecological impacts of our activities, or treat it as questions of efficiency. What's the cost-benefit analysis? All these things Jon talked about. Discounting values to present and assuming this growth. We mostly ignore or miscategorize loss of ecological functions as questions of efficiency when it really should be treated purely as moral obligations to future generations and other species.

(00:52:56):

Those are just my main points. For essential resources markets absolutely fail in this welfare maximizing equilibrium system. And that is what we have to get right, is essential resources.

Nate Hagens (00:53:09):

How could we get it right? And then we'll go to Kate.

Josh Farley (00:53:11):

Some of these things, what we do is every... When there's a war, we actually decide essential resources have to be rationed. I can give a really quick example. When California... we had Enron and these other big players. This is the other huge thing I forgot to mention, that when you have essential resources, the amount of money you can make, you can make more money by producing less, leading to huge amounts of

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collusions. We have OPEC, we have the food sectors. We had record profits in energy and food last year because the producers can... huge incentive to keep supply down, to keep prices up. But Enron some years back colluded with a bunch of other producers to withdraw power from the California system, leading to a tenfold increase in prices, massive economic disruption, political disruption, led to overthrow of the governor and the election of Arnold Schwarzenegger and Brown out; terrible outcomes.

(00:54:07):

At the same time, Brazil had a larger energy shortage caused by drought in a hydroelectric powered economy, and Brazil said, "You know what? We are going to charge you the same price for energy as last year, but we have a 10% shortfall. You're going to consume 10% less. We have your energy bills. We know how much you consume." Everybody had to make this minor effort to be a little bit more efficient. Totally non-disrupting. Nobody even knows about this, because it was such a non-event.

(00:54:33):

When we rely on markets, we're going to allocate resources to those who can afford them, leaving the poor to suffer miserably. When we rely on rationing as we do in World War II or other wartime, we ensure that people get what they need and it keeps prices stable and it ensures that people get enough. But rationing is a taboo subject in economics. We rely on price rationing without ever saying so. Instead, if we ration based on physiological need for essential resources, I think it would be a far more efficient system in terms of creating human welfare.

Nate Hagens (00:55:09):

That's a great point. Rationing is a bad word, but we use rationing when we say the word price. It's just not said out loud. Kate, did you have a comment or question?

Kate Raworth (00:55:20):

I am going to play devil's advocate.

Josh Farley (00:55:23):

Please do.

Kate Raworth (00:55:23):

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Look, Josh, markets are clearly the worst way of running an economy, other than every other way that's ever been tried. You want rationing? Look at the black markets that develop around rationing. Rationing doesn't match what people actually want. It squashes people's different preferences. And so, you get black markets, you get all sorts of people cheating. Look in the Second World War. Yes, you had rationing in the US, we had it in the UK. But there's only so long that people will tolerate it, because there's Mr. Hitler over there. And people actually can't wait to get back out of rationing.

(00:55:58):

Rationing has all sorts of problems. Look at the Soviet Union and the central planning that went into people believing they could determine what that rationing should be. Surely we need to use the feedback mechanisms of markets. Adam Smith was onto something. There's something amazing about the market mechanism, the price mechanism. It conveys signals between billions of people demanding and supplying. It conveys a signal that actually means they can supply and demand, exchange without ever meeting.

(00:56:28):

So, surely we need a system that does use the feedback loops of the price signal. Surely, instead of rations, what we actually need is tax and redistribution. And I totally agree with you, by the way. That wasn't me talking, but I'm playing devil's advocate. But yes, we need a far more equitable society. Because in a deeply inequitable society, prices won't work. You try and change the price, the rich don't notice, the poor can't cope. You need a relative balance. But let's use markets, let's bring in a more equitable tax distribution, and why not introduce a universal basic income? If everybody has the right of access to the market, let's fix this with the universal basic income. Wouldn't that be better than rationing?

Josh Farley (00:57:14):

Great questions, great points. First of all, I would like to say that I'm not opposed to markets in all cases. I think they work particularly poorly for essential resources, and that's where I think rationing should take place. Let's say we do a universal agreed upon income, but we have this problem with essential resources. When the supply of food falls by a little bit, or the supply of energy falls by a little bit, the prices skyrocket, so they consuming a huge amount more of the universal basic income. We would need the incomes to fluctuate up and down all the time with the prices of

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essential resources. Wouldn't it be much simpler to have... And already in most of the civilized world we've agreed that healthcare should not be in the hands of the market. We have universal healthcare. The US is an outlier. We're doing a terrible job on this. But we've decided that... In the US, it's almost 20% of our GDP goes to healthcare. I look at things and instead of having universal basic income, why don't we have universal access to basic needs? De-commodify survival.

(00:58:15):

Right now in the US we spend 6.7% of our income on food for home consumption. We have the supplemental nutrition program, which is food stamps typically. We could have food stamps for all, SNAP for all, and it would guarantee everybody an ecologically and physiologically healthy diet, which would be mostly plant-based. 6.7% of our income is spent on food for home consumption for all food. Take out the expensive, animal-based products. I'm guessing you could feed all Americans an ecologically, physiologically healthy diet for say 2% of GDP. Probably would reduce our healthcare costs by about 2% of GDP, so it'd essentially be free. And what it would then mean is the biggest threat to global ecosystems actually is agriculture. It's the source of the nitrogen, the phosphorus, the toxic chemicals. If you look at the planetary boundaries in your work, agriculture is the biggest threat to all of those, so super important to have physiologically, ecologically healthy food. And as soon as you make sure people can meet their basic needs, then you can start incorporating all the ecological costs into the price of meat. 150 bucks a pound without any concern of the poor not being able to get enough.

(00:59:34):

That's why I think rather than a universal basic income, I'm in favor of guaranteed access to the essential resources. I mean, my favorite approach actually to rationing would be to give everybody in the world, or everybody in the US, the same right to emit CO₂, in which case Elon Musk and Jeff Bezos could not really consume much more than me. What you could do then is make those rates tradable. Many people think this is too free market. But what would happen is... What we need is something everybody will buy into that is going to ratchet down the amount of energy we consume every year. It's the nature of these essential resources that the less you have, the more revenue they generate. As we ratchet down the equally distributed right to emit, the value of that will go up, meaning that everybody will be clamoring to ratchet that down and that will be a massive redistribution of wealth from the billionaires to everybody else. It's one of the few things I can think of that has political support.

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(01:00:35):

So rationing, I think, especially for essential resource. And I'm not opposed to markets in general. I am opposed to individual choice when it's things like climate change, or private property rights. Can I privately own my share of the climate? There's all sorts of things that don't fit into the market model at all, so let's leave them the hell out. That's not saying let's try to force everything into the market model. No. Let's use markets where they work and let's use other economic institutions where markets don't work.

Kate Raworth (01:01:04):

Can I jump in with a quick follow-up question?

Nate Hagens (01:01:06):

Kate then Steve.

Kate Raworth (01:01:09):

Great answer. With education, public provision. And we see it's provided in a public institution, because it is in some way a collectively provided good. Healthcare is provided in a public institution. If you're saying let's just stick with food and you're saying food stamps, I'm just curious, would having food stamps as a form of rationing of that ecologically healthy availability, does that change the provision on the other side of the equation? Do we still have private producers? Who determines the price? I'm just curious what it looks like on the other side of that exchange.

Josh Farley (01:01:44):

Yep. Yep. Great question. I'm actually an advocate. I mean, what I would argue is that we need to invest huge amounts of money in sustainable food production, and it has to be a national initiative like the Manhattan Project, or the moon thing. This gets perhaps slightly off topic, but I really think we need a civilian core where you need two years where you have to actually work to address these big problems we face, and one of those would be agriculture. And we would produce... We'd have young people learning the techniques to produce food sustainably. And one thing about this, it would actually do a intermixing of our populations. People from the big cities and everybody, they'd be going to Kansas, they'd be going... You'd be intermixing blue and red and right and left, and what you find is as soon as you start interacting with the

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people who you think are your enemies, you realize, oh gosh, we're all remarkably similar. I think that could actually help with reducing our political polarization.

(01:02:45):

But I also firmly believe that all knowledge in general, but especially knowledge for sustainable food production, should be freely available to all. Instead, we have these corporations... Mexico. 3,500 years transforming teosinte into corn. Monsanto steps in, spends six months making a new genetically modified type and then they say, "This is ours. You can't use it." I mean, that's just insane. And the idea with knowledge... They say that when you have public investment in agricultural R&D which can be freely used by everybody, you get like an 80% return on your investment. When it's the private sector doing it and they're restricting access, you get much lower returns on your investment, because you're not letting people use it. And so, all the knowledge for food production should be absolutely open access, totally non-market.

(01:03:34):

Then I think a lot of the actual production itself could be done collectively. But also, it's less harmful in my view to have... Okay, we'll pay the producers for the food and have things like when there's too much food we stockpile so that we can control... then we can put it out when there's too little foods, so we keep prices stable. There's a bunch of different things we can do.

Nate Hagens (01:03:56):

I think long-term viewers of this program can now visualize what my five years of PhD conversations were like with some of these guys. Steve, did you have something to follow up with with Josh?

Steve Keen (01:04:14):

Okay, two things. Is that the right way around? Can you read the text there? Good. Okay. This is a friend of mine and a supporter, Avner Offer. Just saw him a few weeks ago actually at a conference with Richard Vague, another close friend of mine working on debt. What Avner has done here is to answer one of the questions that have been posed by Josh's comments. How do you make the divide between public and private provision? The answer that Avner came up with, and I'm very pleased by this, is that it's the payback period. If the investment needed to sustain a particular productive system is outside the payback period that is conventional for capitalists, that's the sort of thing you need the state for.

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(01:04:53):

The idea there, since we're doing this for students, I'd highly recommend students to get a copy of a book by a man called John Blatt, B-L-A-T-T, called Dynamic Economic Systems. He actually makes the case about the payback period that Avner is using there, as well as a lot of other very sensible stuff based on energy and decent mathematics, rather than the nonsense they'll learn from neoclassical students. That's number one.

(01:05:17):

Number two, the idea of having tradable carbon credits is something I've been working on for about four or five years. Badly, because I have got so many other... There's so much neoclassical nonsense to get rid of. I haven't had a chance to do it properly. But there's a website called ecocore.org so www.ecocore.org, O-R-G, that's promoting that idea, developed by another friend of mine, Adam Hardy.

(01:05:43):

The idea would be that every day you would get issued a carbon credit equivalent to the average for the country you're in. And then you have to pay two prices, not just one: a money price and a carbon credit price. Given the inequality of distribution of income we have, 95% of the population would probably not exhaust the average. But the top 5% would and they'd be needing to buy off us straight away. The idea is there'd be an income and wealth redistribution from the rich to the poor, and immense pressure on everybody to reduce carbon consumption. Except the poor actually. They'd be doing pretty good out of it for a short while, so it'll be politically popular as well. Now, that's the sort of thing economists would resist till the cows come home of course, but it's what we need. And equally on rationing, the point about Germany and the Second World War that Kate made earlier is completely valid, and I think we'll need rationing to get through the catastrophic consequences of climate change that the economists are persuaded aren't going to happen. When they do start happening, rationing will be about the only way to hold together a cohesive society. They'll be seen as global conspiracy nonsense by the world of Economic Forum twerps who believe that those idiots are actually in control and know what they're doing. Having met a fair few of them, I know that they can't even order lunch, let alone the global economy. That sort of stuff is going to be necessary, but of course it has to be transitory.

Nate Hagens (01:07:11):

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Jon has a comment and then we're going to move on to our final panelist.

Jon Erickson (01:07:17):

Yeah, just some closing thoughts here before Kate takes it home for us. Well first, Steve, the very first paper I ever published, I was a master's student, 1992 I think, was called the Inefficiency and Unfairness of Carbon Permits. I won't go there, but there's a lot to unpack there. And one of the things I was reflecting on as Josh was talking was, as a graduate student sitting in the office of Henry Shue, who was an ethicist, myself coming from an econ theory class and trying to defend the sacred organizing concept of economics of Pareto optimality to an ethicist. Pareto optimality is this idea that you can't make any moves. The only Pareto-optimal moves allowed is when you can make someone better off without making someone worse off. And he just sat there and said, "Okay. You're doing climate economics for your thesis, right?" I'm like, "Yeah." "So tell me the difference between necessity emissions and luxury emissions." And immediately burst my bubble on the whole idea of Pareto optimality.

(01:08:28):

In fact, early economists like Turgot talked about the other sacred principle of economics is the law of diminishing returns. That the more you have of something, the less it's worth to you. He made the case through the law of marginal returns, diminishing marginal returns, that we should be reallocating from the wealthy to the rich. Or to the poor. Or from the luxury emissions to the necessity emissions, because it's welfare improving. It's welfare improving. And so, I'm not convinced that tradable permits would actually do that, but that's for a whole nother podcast perhaps.

(01:09:07):

At the end, rationing has become taboo in economics, but so has human rights, so has sufficiency instead of efficiency, so has the idea of necessity over luxury. It all comes back to in economics we're not allowed to compare utility. We're not allowed to compare consumption, we're not allowed to compare what gives us pleasure and pain. As long as you keep the individual isolated from everybody else, then none of this nonsense that you all are talking about matters in economic theory.

Nate Hagens (01:09:36):

Josh, did you have a closing comment there?

Josh Farley (01:09:40):

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Yeah, and I'll make a closing comment kind of in response to what Jon just said too. I went and looked through a whole bunch of introductory textbooks and they all say there is no difference between luxuries and necessities, or between needs and wants. They said there's no difference. Right away they just sweep that under the table. Then the other idea about Pareto efficiency, you can't do... we only do things that make somebody better off without making anybody else worse off. In a fossil fuel powered economy, everything you do makes somebody worse off. Right away we should say, if there is such thing as climate change, then Pareto efficiency is the stupidest measure you can come up with. Let's not even mention that.

Steve Keen (01:10:21):

All the stuff neoclassical economics has done has proved ways in which the classical and the physiocratic school have, we'll say the classicals were correct. In fact, one thing I would say if you work at the level of the isolated individual, they can't even derive a demand curve. How can they market their bullshit over that. They do not do it. Check your textbook, kids. You'll see. They do not show how you go from an individual curve to a demand curve without making some sort of bullshit assumption. They can't even do that.

(01:10:47):

And what that actually proves, and this is the case that Alan Kerman made in *The Emperor's New Clothes*, is that that forces us that we have to work at the aggregation substantially higher than the individual. That's to meet the failings of neoclassical economics, which means class-based analysis is correct. We're back in a classical world, we look at workers, capitalists, income distribution, et cetera, et cetera; taboo topics in mainstream economics, which mainstream economics has proved are necessary.

Nate Hagens (01:11:15):

Professor Raworth, please tell us about the big picture that is being taught in economic theory and what some changes to that might be required.

Kate Raworth (01:11:28):

Okay. I want to talk about the biggest picture of the economy that we ever encounter. If you say, "Show me everything you've got, show me the whole caboodle," what shows up? And I'm going to talk about econ 101, because I think it's the most important course. It's where we begin. Paul Samuelson knew it. The first textbook you pick up, the

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first diagrams we see, they shape what we forever see and don't see afterwards. In mainstream economics, the biggest picture is going to look something like this. It's called the circular flow of goods and money. And what we've got is households and businesses in the essential market relationship. Households provide labor and they can provide capital. In return they get wages. Some get wages and some get profit. Depends whether you gave that labor or capital. And they can use that for consumer spending and in return they get goods and services. So you've got the goods going round and round, the resources going round and round, and the money going round and round.

(01:12:18):

And yes, not everything goes on consumer spending. There can be some leakages. The diagram shows that some of it goes into savings, which get put into banks and get turned into investment. Keep your shirt on, Steve Keen. I know that's not true. That's not the way banks actually work, but it's very nice for a fundamental 101 diagram. We've got some of the money goes into taxes for government and they can turn that in spending. Actually, in countries with a sovereign currency, that's not how governments work either, but it's very handy for 101 diagram. And some of the money goes on imports, but other money comes back in through exports. The point here is, everything is circular, it's contained, it's enclosed, and these arrows tracking monetary flows. I want to start by recognizing what's useful. Because all models are wrong and some are useful. Why was this ever seen as useful? I really like leaning into what could have been useful about it. It's really useful for measuring GDP and showing that it can be picked up in different places. It's useful for tracking flows of money, even though some of them are completely fictionalized. But what it misses is really what matters, because it's never even pointed out and it never comes in anywhere. One, it has labor getting fresh and ready for work every day. It completely misses the unpaid caring economy: the household, the cooking, washing, cleaning, sweeping. Labor is just ready to go to work every day. It misses the commons. It misses all of goods and services that are produced without money changing hands, because it's only showing us market-based. And it misses, of course, the living world. There is nothing coming in and there's nothing going out. It's missing energy and it's missing resources that's somehow within, circulating in some sort of perpetual motion machine.

(01:14:07):

These are fatal flaws. If the biggest diagram that we're teaching students does not have energy and materials from the living world, it does not have unpaid care of the

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household, it does not have the commons; three of the most fundamental sources of our wellbeing, they're absent.

(01:14:22):

This does not serve us, so I want to replace it. Because I always love to re-proposition and replace. So here we are in technicolor. I call this the Embedded Economy Diagram. It draws on ecological economics, feminist theory, and commons theory. What have we got? We've got the economy is a subset of society, which is a subset of the living world. That's the first move of ecological economics. It means that we recognize that the economy is drawing on materials and matter, it's putting out waste and pollution, and it's bathed in a river of solar energy. Welcome to the second law of thermodynamics. We're always asking, is our economy compatible? Is its through-flow compatible with conditions conducive to life?

(01:14:59):

But then let's look inside the economy. Yes, we've got the market, which is where IOI always begins, and we've got the state. And these two of course are what show up in GDP. This is what's measured monetary output. But what's missing is on this vertical, which is the household of unpaid caring work. That's the feminist economics coming in. And then here's Elinor Ostrom saying, "Don't forget the commons." They may well not be tragic, they're a triumph. When they're organized according to principles that she revealed, the commons can actually be a fantastic source of providing for our needs and wants, which are different from each other. That's the second move.

(01:15:35):

The third one... This is like a pop-up book, isn't it? Third one is the different roles that we play within the economy. And I'm going right back to where Jon Erickson had us begin, because mainstream economics depicts us as that rational economic man. Are you consumer or producer? Karl Marx reminded us to always ask, in the sphere of production, are you labor or capital? It's going to make a difference, guys. We may be in that market space, but we're also in the state relation. We may be a resident or a public servant, a protestor or a voter; all essential roles we play in relation to the state. In the household, parent, child, guardian, carer. In the commons, a co-creator, sharer, repairer, and steward. What kinds of values and collaborations and skills and behaviors are required of humanity to operate well across all of these ways of provisioning for our needs and wants? Because I know I don't want to live in a society that lacks any one of them. I think markets and states and households and commons

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all bring really interesting, unique, different qualities that can work for providing different kinds of goods and services, just as Josh was describing.

(01:16:39):

So, we need to be able to recognize we move between these every day, and we need the skills to collaborate in them. And it turns out that even rational economic man isn't the useful guy we want for the market space. We actually want cooperation and to use the best of human intelligence and pro-social skills in the market spaces too. So for me, this is a fundamental move and should be a diagram that we begin with. Of course, it doesn't give you the flows. It's not about flows, it's about relations. It's focusing on relation, economy contained within society, within the living world. It's looking at the relation between market, state, household, and commons, inviting us to explore the power relationships that exist between them. In fact, across every line in this diagram there's a power relationship. Between humanity and the rest of the living world, between the market and the state, between the market and society. We should bring that power conversation into the first economics class.

(01:17:34):

I'll stop here and also invite any of you to say, is there something you'd change in this diagram? Is there something else you think should be added to it that really should be there on day one?

Nate Hagens (01:17:44):

Thank you, Kate. I'm going to ask a clarifying question and then, Jon, you have your hand up. Could you show me the first graph that you had of the other one? There are 240 million college students in the world, and Jon just told us earlier that economics and political science are among the most popular majors, in the United States at least.

(01:18:10):

Is that diagram that you're holding, is that actually taught worldwide today in Economics 101 classes?

Kate Raworth (01:18:18):

I'm going to say a variant of it. If you look through the textbooks, they'll all have a diagram that's called something like Circular Flow of Goods and Income. It'll all be some version of this.

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Nate Hagens (01:18:29):

Wow. Wow.

Josh Farley (01:18:30):

Maybe only 99%.

Nate Hagens (01:18:33):

Well, you're talking about your textbook, Josh.

(01:18:36):

Okay. Thank you.

(01:18:37):

Comments?

Jon Erickson (01:18:39):

Well, even that diagram is in our ecological economics textbooks, because we're always in this defensive posture, so we just have to throw it out and start anew.

(01:18:50):

Just more of a comment, Kate. Thank you for bringing it full circle, because that first model, asking the question what is useful and what does it miss, what's missing, I think answers my question, which George Box didn't ask, useful for whom. We've built a model that has been very useful for white male capitalists. If you look at the stats on who we're graduating as PhD in economics, economics continues to be woefully behind in terms of gender diversity, ethnic diversity, diversity of thought from around the world. It's another one of these reinforcing feedbacks.

(01:19:36):

Then if you look at the new model and, again, ask the question useful for whom, because it's a model, you see that it empowers a whole new class of people. It empowers anyone who doesn't probably identify as a white male capitalist. So this is our challenge, to build a new model that disempowers the status quo and rebuilds something that is truly built for humans and for resilience and for long-term viability of our place on Planet Earth.

Josh Farley (01:20:12):

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I was going to say, I actually start out my class very, very similar to what Kate's saying. I asked my students, I said, "What kind of economy were you raised in?" They all say capitalism. I say, "Oh. Your parents charge you room and board?" I said, "You were actually raised at a reciprocity based economy, where you get things because people love you, you're expected to return those things." I actually think that when, (01:20:38):

right now, and we're looking at solving all these global climate change, we're always drawing from the market, the market. Why don't we draw from the reciprocity and gifting part of the economy? Why don't we look at everything we receive from nature as a gift for which we are morally obliged to reciprocate, meaning we have to see our species as part of the collective species that sustains all the life support functions. Right now, we're total freeloaders. We're getting, getting, getting, giving nothing in return. We're the worst case.

(01:21:07):

One other comment I wanted to make, and another way you connect back to Jon. Jon was talking about Homo economicus, a lot of evolutionists are now recognizing that humans evolved to be so successful based on our ability to cooperate. Elinor Ostrom's work on the commons, she has these eight principles for successful management of the commons, the evolutionists have come up with eight principles for successful cooperation, arguing that these are the principles that drove humans to our current success or risk of catastrophic failure, but that human nature was actually ...

(01:21:48):

We were capable of solving these social dilemmas, things where if I act in my self-interest, it's better for me but worse for society. We figured out ways to solve that through cooperation. That, I think, is still the basis of the core economy, the household. That's where we should be looking for solutions to the bigger challenges we now face. So I do like the connection between the start and finish in this.

Kate Raworth (01:22:11):

Yeah. Actually, can I jump in there? Elinor Ostrom's core design principles, as you're saying, she drew them out through studying the commons. But actually, as you just said, each one of these markets on the commons is about human relations. These are different forms of relations. I love your saying to your students, "Oh. Raised in

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capitalism, really? So you paid room and board," to remind us that actually we move every day, almost without noticing it, between different forms of relation.

(01:22:44):

I don't know. If you came over to my house for dinner ...

Josh Farley (01:22:48):

Which I did once.

Kate Raworth (01:22:48):

... and we had a lovely meal, and then you offered to pay me at the end, I would be offended, because you would've placed that interaction in the market. I'm like, "No. Josh, this is gift." There's a lot of taboo around getting it wrong. Should I pay or not?

(01:23:05):

What Elinor Ostrom tapped into there about the core design principles for the commons, what if they're actually valuable also in the state? Can we redesign state services to be much more like forms of cooperation?

(01:23:21):

There's a nursing cooperative in the Netherlands where they work in groups of, I think, around 12 nurses. It's totally distributed. It's much, much more efficient, a much lower cost than a very centralized, bureaucratically run nursing system.

(01:23:37):

I'm just fascinated of what happens if we take these core design principles into our homes and actually think about, well, who does all the washing up around here. Can we redistribute household work? There's a gender politics to that. What happens if we do take it into business? Well, that might be a cooperative. That's a business. It might be an employee owned company, a steward run company.

(01:23:56):

So we can bring these design principles and say they don't just belong in the commons. We may have discovered them through the commons, but maybe they infuse the way we relate through all of these different forms of organizing.

Steve Keen (01:24:06):

I like the fact that Kate's diagram takes us actually back to where we should have started, which is the Physiocrats. Because if you look at the Tableau economic and the

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arguments of the Physiocrats, they said all wealth comes from nature. They didn't realize it, because they were saying it before we invented the word energy, but fundamentally, they're saying we benefit from the free gift of nature, which is energy.

(01:24:25):

That gives you the whole external to internal. Waste is inevitable. So we end up with a framework which is correct with the second law of thermodynamics. As, I've forgotten the actual author, Eddington said almost a century ago, "If your theory is conflicted with the second law of thermodynamics, there is nothing for you to do but collapse in absolute humiliation." That's economic theory as it stands at the moment. So it brings us back there.

(01:24:51):

Then a huge part of what Neoclassical is saying, we've got this perfect system, getting marginal cost and marginal benefits right. Let's infuse that in the rest of society. You're making the opposite case and say maybe we should infuse concepts from other forms of interpersonal and physical relations, which occur inside the family as well, to the rest and see how that benefits.

(01:25:12):

If you look at the foundations, the argument of marginal cost and marginal benefit, they're all shot full of holes, including empirical ones, because for 95% of firms, they have constant or falling marginal cost. So the whole idea that you have rising marginal cost-cutting off rising marginal benefits is simply empirically false.

(01:25:30):

If you don't believe me, students, go and get a copy of Alan Blinder's textbook, in which you will not find anything about this whatsoever, and go and find a paper by Alan Blinder in 1998 in a book called Asking About Prices, where you found he found that's what happens, and he doesn't teach it to his own students. He's literally lying to you because he couldn't cope with the truth.

(01:25:51):

We're back in the honorable men, whatever that Tom Hanks ... that movie is called. Not Tom Hanks, obviously. But yeah, you can't handle the truth. That defines Neoclassical economics. That's what we're trying to bring into you here is the truth.

Nate Hagens (01:26:07):

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This has been fantastic. I'm going to ask a question for each of you to opine on. Can reality of the sorts that we've been discussing these last 90 minutes actually start to be taught in modern universities around the world at scale? Or, as inferred in the early part of this conversation, does economic theory just mirror the stage of our cultural moment in time, based on energy surplus and large gaps in inequality, and it's the people at the top that are using economic theory as a crutch to rationalize and describe our economic system? Can these things really, at scale, be taught in our university? What do you guys think?

Steve Keen (01:27:01):

I don't think they can, because the Neoclassical hegemony is so complete, and the funerals ... We can't rely upon funerals. That works in physics. It doesn't work in economics because the crises in economics are transient. You have the Great Depression. Who talks about the Great Depression today? Hyman Minsky got created by it in a sense, but mainstream ignores it. The great recession, even that's disappeared. Now we're talking about the great inflation. Now that's disappeared. The crises aren't permanent, therefore you don't have a permanent confrontation between a failed paradigm and the anomaly that proves that it failed. So they can accumulate all these failed elements over centuries and do nothing about it. They don't change.

(01:27:42):

That's one reason there's two potential non-mainstream universities teaching unorthodox economics. Steven Hail has started a program down in Australia in Adelaide with a private university. As much as I think an education should be public, because it's public, the Neoclassicals dominate the quality control. Because they don't have any quality, we get shit economics taught. Pardon me kids. That's what you're going to face. It looks plausible, convincing and wrong.

(01:28:12):

So the only revolutions are being done outside the mainstream, with Steven Hail's course, and I'm now teaching a commercial course as well, distributed by some absolutely appalling marketing on occasions, but it's the least a way to get the non-orthodox economics in. I'm hoping to get a discounted version for students soon out through the marketing company.

(01:28:31):

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But yeah, the mainstream will dominate economics and they'll kill it. That's because we're treated as a public resource and they've got control of it.

Josh Farley (01:28:39):

Yeah. Sadly, I agree a little bit with Steve in that it's so hard to change the Neoclassical. When I first studied ecological economics, I thought, "This is the future. Neoclassical economics will be gone within a decade."

(01:28:53):

Interestingly, here, one of the professors in environmental economics at my university actually told his students that he would give extra credit to anybody who beat up my TAs because he was so sick of their questions. It was obviously tongue in cheek, but the students in the econ department are clamoring for alternative views.

(01:29:13):

They have tried repeatedly to get ecological economics courses cross-listed. At one point, they got close to doing it, and the professor who said he would get them cross-listed actually died. The students then said I had promised I would submit my courses for cross-listing again. I said, "It's going to be pointless. They're not going to do it, but I'll do it." Their answer was, they said, "Well, we're not going to cross-list your introductory course because we already teach that," which is totally wrong. And they said, "We're not going to cross-list your upper level course because we don't teach that." So if you're not going to cross-list what is or isn't taught, that's pretty all inclusive.

(01:29:48):

But I do see enormous ... Every few years, students in econ programs are writing these manifestos, complaining what they are taught doesn't make any sense. So the way, I have to say, I have to ... Every class I teach, I tell the students, "If what I teach you doesn't help you understand reality, it's useless. If it's contradicted by reality, it's wrong. It's your job to test what I teach against reality."

(01:30:14):

I do think students respond very positively to that approach. They tell me, in the econ program, they're basically told, "If you disagree with anything we teach, you're wrong." I think if change is going to come, it's going to come from the student body forcing the other professors to change their views.

(01:30:38):

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But to get back ... Before we started, I mentioned that one of my colleagues had sent me a podcast by Steve on The Great Simplification. That professor was fired for teaching heterodox economics. Literally at his trial, they had a thing that one of his lecture notes that showed general equilibrium in quotes, as though it was not robust scientific foundations. It's very, very difficult to change the system. They have a lot of control over what is taught.

Nate Hagens (01:31:11):

Wow. Kate and then Jon.

Kate Raworth (01:31:14):

Well, I really like your question at the beginning, actually, Nate, just saying is it while we're in this carbon bubble, that's the water we swim in and we just have no capacity to see beyond that. If that's the case, what will it look like? What will the sudden swing be? Will economics as we know it change, and suddenly energy will suddenly be discovered? How will it enter? It probably won't enter in the ways that any of us are wanting to, right?

(01:31:44):

When an issue is neglected until there's a crisis, the real risk is it won't get picked up in the way you hoped. It'll get picked up in frames of models that work for those who want it to continue to work for them. How will that go? That's a new question for me.

(01:31:58):

But I am going to lean into possibility. If economics only changes one funeral at a time, it also changes one eighth grader at a time. It changes the way we teach it anew. So I'm thrilled that this international baccalaureate edition of economics, without my knowing it or anything, they decided to stick the doughnut in right up front. Now it does immediately, the next chapter, switch into supply and demand. So there's some way to go yet, but it's starting to get into the textbooks.

(01:32:26):

What I hear back from high school teachers is, "Now that it's in the textbook, I can teach it. It's in the curriculum. It's legitimate."

(01:32:35):

We're working with a group of teachers who want to write ... Rather than trying to reform economics, and I think this is where this question comes down, do we try and

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reform economics or do we just say, "we'll just leave you sitting there. We're going to go and do something new." So we're working with a group of teachers writing a GCSE, which is around for 14, 15, 16 year olds, in regenerative economics.

(01:32:55):

What would it look like if you started economics ... It's going to be regenerative economics, working with the lovely principle Josh just offered, tested against the real world. We are putting this diagram as the first diagram. You can imagine lots of chapters from regenerative economics. Now we've seen the whole ... Now let's talk about markets, and let's talk about the very different ways ... Let's talk about markets and states, and what necessary goods and what luxury goods, and how they should be provided, and the relations between.

(01:33:22):

So I'm leaning into possibility. I'm certainly not going to give up. Yeah. There's movement.

Jon Erickson (01:33:32):

Yeah. I take your question ... The answer to it is larger than reforming just economics education. It's really reforming education, reforming higher education in particular. I start most of my classes with that question, what's the purpose of a university education? I often get the answer, "Well, get me a job, to train me in skills, to teach me something useful where I can build an income." I say, "None of that is in our university charter. Let's read it." It really is ...

(01:34:10):

Education is foundational to a democratic society. Education is foundational to higher human aspirations. Educational is foundational to long-term viability of the human animal. My greatest fear is that we've designed our education systems to inoculate consumers instead of train citizens. And citizens at scale, right? Citizens who can make impact in their local communities right up through the global community.

(01:34:41):

So I'm increasingly drawn to next systems thinking. I recently used a book in my class called The Next Systems Reader, that was edited by Gus Speth and colleagues, to really open up the conversation of alternative systems, alternative ways of organizing the economy, alternative ways of organizing human assets and knowledge and ways

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of thinking. The students were just blown away because it challenged their basic idea of living in a capitalistic society.

(01:35:20):

There's that parable of a fish. Someone asked a fish, "Do you like swimming in water?" I'm getting this all wrong. The fish was like, "What is water?" We are inside the system we're trying to change, and we don't even know the right questions to ask.

(01:35:38):

I'm part of an initiative. I'm building a next system studies program across the US to really think of this at the deep root causes of the problems of the current system and to imagine the next system.

(01:35:53):

I'm finding, actually, that the next system's ideas are all around us. They just don't often exist in national governance. They're at community scale. They're at local scales. They're in farmer's markets. They're in reciprocal economies. They're in gift economies. They're in neighbors' backyards. The next system is everywhere. So I'm increasingly working with my students to really elevate those stories and to scale them up and out.

Nate Hagens (01:36:25):

This has been really, really great, and information and insight packed. Since we're all friends, I hope I can count on you, either as individuals or as a group, to come back, because we've really just scratched the surface here. This is our world. This is our future. I think, especially for young humans, I wish I would've been 18, 21 learning what I learned today.

(01:36:54):

Should we go around with any 30 second, 60 second closing thoughts by everyone?

Steve Keen (01:36:59):

Okay. I'll quickly say one thing the Neoclassicals like to say, "If you take all that stuff seriously, you can't do modeling anymore." Garbage. There's been an alternative technology for 50 or 60 years called system dynamics. If you want to give a trial of that, download ... Search for Minsky on SourceForge, which is my open source contribution, system dynamics modeling. You can do much better modeling if you throw away the Neoclassical handicaps.

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Nate Hagens (01:37:22):

We'll put that in the show notes. Josh?

Josh Farley (01:37:25):

Yeah. I just would be remiss to say that ... Jon actually started a big effort to change the way we teach economics, was Economics of the Anthropocene, which has now become Leadership for the Ecozoic. I've now taken over from him here, although he's still, obviously, contributing.

(01:37:41):

We really do have a concerted effort. We have a very good PhD program. We're producing a new generation of whom we believe will be the leaders in economics. They are getting good university jobs, and they are making an impact. So despite my pessimism at changing econ departments, I think we can step around econ departments and really introduce these ideas. Our program is with McGill, so if there's any potential PhDs in ecological economics interested in these ideas, you can find us under Leadership for the Ecozoic.

Nate Hagens (01:38:16):

One of your former students has a system synthesis podcast as well.

Josh Farley (01:38:21):

Yes, yes. One of my former students, prior to these things ... Nate is exactly ... What we aspire to is to get people who will be more influential and effective than we are.

Nate Hagens (01:38:32):

Thanks, Josh. Jon?

Jon Erickson (01:38:33):

Yeah. I started this by saying that economic starts with a really simple starting point. I think the reform starts in equally simple starting points. We need to re-embed the person in family and community, and re-embed the economy in society and the earth.

(01:38:52):

I think Kate's image of the doughnut economy is a great place to start. Sorry, Kate. This is not an insult. It's not rocket science. It's really simple and it's really intuitive.

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When we start there, and treat people as humans, and not these foreign things that we try to shape them into, like Homo economicus, it's quite easy and quite intuitive.

Kate Raworth (01:39:20):

Then I'll follow on. I'm so thrilled that you think the doughnut is not rocket science, because that means it re-politicizes the economic conversation. I never intended to call doughnut economics doughnut. I didn't make that word up. Somebody else said, "That diagram you've drawn. It's a doughnut," and it was given that name. It's playful and often silly. People say, "Why did you call it that?"

(01:39:44):

But what I've learned is that, and as we all know, many people are intimidated by economics. It's expert. It's technical. It's fast. It's alienating to many, many people. But if you stick doughnut in front of it ... People already know this. Bring your humor. Bring your mischief.

(01:40:06):

That's, I think, what we need to do with so much of the economics we're talking about. The way you're talking about teaching it, bring it into the classroom. Does this fit with your experience? Does this fit with what you know of reality? Let's bring it back to something that people connect with.

(01:40:22):

The route I've taken is to step away from academic economics and say, I think a lot of 21st century economics is going to get practice first and theorize later, because the vast majority of the economists are still working on the old style. So let's work with the practitioners.

(01:40:38):

That's what I did in setting up Doughnut Economics Action Lab. Okay. Let's start working with the cities that want to do this. How then will they make decisions if not through cost benefit analysis? Let's work with the companies that want to be purpose led, and actually design themselves to become regenerative and distributed by design. How then will they marry the requirement of making a profit, in order to stay in business, with actually putting value of ecology and society first?

(01:41:06):

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We're working with the practitioners. As you just said, it's all around anyway. It's already popping up. If only we find ourselves, and put it in our models, and make it visible, and we see it.

Nate Hagens (01:41:17):

Thank you. Thank all of you for your insights and time today, and for your dedication to this work, this story, which is the story of our times. To be continued. Thank you all very much.

(01:41:32):

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