~Hello ~

Hello, my name is Paul Sztorc. I have a relatively mainstream background – public school in Connecticut for 12 years, private engineering college in Ohio, where I studied economics and statistics. I then worked a kind of pre-doctoral research statistician job at Yale for 2 years for a man named William Nordhaus, who just won the economics Nobel Prize a few months ago. So my economic training is quite mainstream.

Despite all of that, I fell in love with Bitcoin in 2012. I've published Bitcoin research on my blog "truthcoin.info" since 2014. I presented at many Bitcoin conferences, especially the scaling conferences, as well as Building on Bitcoin (last summer) and TABConf earlier this year.

~about transformation, not replacement~

The topic of this presentation, is an idea for getting the public sector –I've put it there, in a big scary red blob-- to _substantially inherit_ most of the reasonableness of the private sector.

This presentation is NOT about replacement. It is not about replacing the public sector with the private sector (somehow). So you have to decide how anarchist you think it is. Its up to you.

~in one slide~

Here's the talk in one slide:

Problem – politicians are installing bad polities and getting away with it.

Solution – make it easy to find the bad politicians, prove they are bad, and get rid of them.

Specifically – Create these assets, whose value reflects the politician's competence. Then we'll make the pricing data available, and voters will just vote for… the person who has the best numbers.

So…

~example ballot info~

…people might have this information available to them, just before they vote. For each person running, it gives forecasts of how life will be, if they're elected. The first row guesses how much the government will cost, the second row guesses how economically prosperous the citizens will be, and the third row would cover things like, invasion, healthcare, mental health, gun safety etc.

Now, where do these numbers come from, and why would anyone take them seriously? Well, that's what the talk is about.

~agenda~

First, I'll give some background knowledge. Second, I'll talk a little bit about democracy and electoral feedback. Third, I will talk about event derivatives. Fourth, I'll combine all of those ideas. And Fifth, I'll explain why I think this idea will actually work.

~BK-overview~

So, the background knowledge that you need to have, is that this idea is very old, and a lot of super smart people like it. And, second, I've already basically implemented the idea. Third, there's no scam-ICO or any other scamming here.

~name-dropping~

So first, be aware that the idea I'm presenting was a favorite of Hal Finney's. Hal received the first Bitcoin transaction, and many people think that he was Satoshi Nakamoto. The idea is also a favorite of Robin Hanson's, who is endorsed by Ralph Merkle who built most of the technology in Bitcoin.

~authors~

This paper was put out, in order to try to convince the government to stop interfering with prediction markets (or 'event derivatives' as I call them). Its signed by a ton of people – just about all of these

people have either already won the Nobel Prize, or they probably will win it, or they should. Just huge

names. Very famous and well-respected.

~tangled web slide~

Second thing: his talk assumes that someone solves the so-called Blockchain Oracle Problem. In order to

make these assets. Fortunately, I've solved it so there's nothing for you to worry about!

~truthcoin paper~

I wrote this paper about it.

~Endorsements~

Here are some reviews of this paper – you can see Roger Ver, and also Peter Todd, and also the CEO of

Blockstream as well as Andrew Poelstra -- one of the brightest technical minds in the blockchain space.

…

The *paper* actually spawned virtually all of the projects in this area…

~multiple implementations ~

…some of which I'm more proud of, than others. The only one I like, is this one at the top – I oversaw its

development personally; it is a fork of Bitcoin Core, and it was assembled by two Bitcoin Core

developers, over about 24 months. And I run the project website, where I put content like today's

presentation.

~screenshots~

Here are some screenshots. Hopefully, by the end of the talk, they will make sense to you.

This project here, could theoretically be live, on the BTC mainnet, as early as *this autumn*.

~no ICO~

Finally, I'd like to mention that there is no ICO, no utility token going on here. There *is* a second token, which often leads to misunderstandings. This second token is more analogous to _mining_ – in Bitcoin, people who _transact_ don't need to _mine_. In this project, users don't need to know anything about the second token, nor do they need to own any of the second token…unless they want to go into that line of work, of course. Customers use Bitcoin only. It's a Bitcoin-only project.

~Intro Slide~

Ok, now we can really get started. Part 2.

~Bad Public Sector~

Why is the public sector so disappointing? Everyone hates it, not just people who come to anarchist conferences. So the question is: why is it so bad? My argument will have nothing to do with morality, or with lofty abstractions like "freedom" (or whatever). It won't even have that much to do with economics. Instead it is going to have more of a physics or biochemistry flavor…

~Feedback~

…because it rests on this idea of **_feedback_**. Here's a basic feedback loop: we start with bad products being sold, consumers don't like the products, and buy fewer of them, which punishes the merchant. Free market doesn't mean instant utopia, right? But it does mean that things improve, and they improve, basically, as fast as is possible.

~ballot box~

The modern democracies that most of us live in, also have feedback. Called voting.

~election feedback~

When the government is too unsatisfying, in any way, it can be dismissed by a majority vote.

~post-enlightenment government slides~

Now, it's a little more complicated than that. There's these other things. But…

~election feedback~

…basically this is the main gear in control of this machine.

…

Now, free-market feedback differs from electoral feedback. We know they are different, because one is pretty awesome and the other is pretty lame.

Frequency is one difference. The market-feedback fires, every time a merchant loses a sale – that's many millions of time per day. Electoral-feedback fires once every… four, or two, or six years.

But that difference, pales in comparison to one that I call ***research***.

~ research slide ~

You see there's even more feedback than you originally anticipated. When a /disappointing sale/ is completed, the consumer suffers. This desire to avoid suffering, stimulates the consumer's *search for alternatives*. And I call that search-effort: "research" (for lack of a better word).

~cost/benefits of research~

Now, in both sectors, public and private, you have to do your own research, and you have to pay for it. Research consumes your scarce resources, especially your time.

Important things you research a lot -- Buying a house, you'd research a lot. Picking out a hotel room, on the other hand, not as much research. Cosmetic surgery – lots of research; buying a new pair of flip-flops – little research.

So the problem with elections is that, your single vote will almost never affect the outcome. People pretend their vote matters, in order to feel important. But really, they know it doesn't matter. So

if you master the issues and the candidates, and do a lot of research, it won't _change your life_ in the slightest. So there's no reason to do any research.

Now this is, of course, a big oversimplication, but I think its basically the explanation. Voters will usually admit that they don't know what they're doing. 71% of people cannot even _name_ their Congressional Representative, let alone what they've been up to. And why bother learning who the Representative is, because it basically makes no difference.

~breakfast~

At breakfast, on election day, voters will carefully weigh the costs and benefits of different breakfast foods, that they could eat. But when they go in to vote, they won't really know anything about the costs and benefits of their choices. Hence this idea.

~layperson paradox~

An implication of this theory, is that educating people in order to make them libertarians, or experts in economics, will never solve this problem. It is very noble, and worth doing – in the same way that chemistry and music are worth doing – birdwatching is a real skill and mastering the skill of birdwatching can be fun – but ultimately if **_persuasion_** were effective then the elections themselves wouldn't be so problematic. FREED-rick Hayek would have be wrong about information-diffusion, AND a centrally planned economy would be more efficient than LAZE-ay faire. The research-incentives are the whole problem in the first place, as I've argued.

Part 4 – the solution

~Overview~

So, what _should _we do? As I said, the plan is to have people show up on election day, open their cell phones, and check some prices. It should be as easy as checking an NFL score, or the S&P 500. Then, they vote for the candidate with "better" prices.

Now, prices of what?

~Intrade Global Warming Example~

An event derivative (usually called a prediction market) is defined as an asset pays you money if something happens. If that happens, you get paid. If it doesn't happen, you don't.

This is an example from intrade. This asset was created in 2011, and it would have been worth one dollar, if the year 2012 had been the warmest year on record, as reported by these NASA satellites that measure surface temperature, and put it on a website… where anyone can find it. Otherwise the asset is worth zero. The asset traded at 40 cents in Jan 2011 but by mid-2012 it was worth just ten cents, and in Dec 2012 it was worth nothing.

So, event derivatives are similar to "bets" or "wagers". The difference is that, with event derivatives, the prices are constantly changing. In a bet, the odds a fixed; usually just at 50-50. Where's the fun in that? With these assets, the market price is the objective likelihood of event in question. As 2012 went on, it was clear that it wasn't going to be the warmest year, so the price collapsed.

~Election Betting Odds: Trump Nomination~

The topic of Prediction Markets, usually reminds people of _election betting_. These are assets that pay out if their candidate won the 2016 republican presidential nomination. After the Iowa straw poll, Trump's market price plummeted. Then it surged after he won South Carolina.

Is this what I'm suggesting we do?

~No~

No. This… … is lame. It certainly is entertaining; and it makes election years much more fun. But it only tells us *who* is going to win.

Instead, we want to change who wins. We want to sabotage the incompetent candidates, to make sure they can't win.

How do we do that?

~Nine slides~

The answer is multivariate betting. I will now try to explain it in exactly nine slides. Hopefully, after this, everything I've said will make sense. The first two are super-easy, and four of them are really just one slide, broken into four pieces.

~mv1~

Here, on the left I have a series of coin-flip events. In this table, we're describing the behavior of the three-hundred-and-third coin flip. We don't know what will happen on that flip, but we can nonetheless fill in the probabilities in this table. Heads and Tails are equally likely so its 50-50.

~mv2~

Now, this slide is the same as the previous one. But it has a dice roll instead of a coin toss.

Each side of the dice is equally likely to come up, each has one-sixth probability.

~mv3~

Now here we go, three of seven…

This example, is the previous two examples, smushed together.

We have the coin flip in green along the left vertical edge of the table. We have the dice roll across the top horizonal edge.

I've circled some probabilities in red. The probability that two will be rolled, is one-sixth. The probably that a tail will be flipped, is one-half. Those are called marginal probabilities because they're written in the margin, so to speak.

The probability that BOTH a two will be rolled, and a tail will be flipped, is shown here as one-twelfth.

~mv4~

Now, we'll talk about relationships among events. Let me draw a contrast between these two blue tables here.

Both are about unknown future coin flips. The top table considers coinflip three-zero-four, in blue across

the top. And it considers flip number three-ohh-five, in red across the left side.

Each cell will occur with probability point two five, which is what I have indicated here.

The second table does something extremely unrealistic, and only useful for teaching purposes. It plots coin-flip #304 against itself.

Again, in the real world, this would never happen. But, if it did happen, what probabilities would we write in this table?

~mv5~

Here's the answer. Fifty zero zero fifty.

Coin flip #304, can either be heads or tails. But it has to be one or the other. So we zero out everything that's impossible.

~mv6~

Here's this example again, with dice instead of coins. Same dice roll, we don't know what it is yet.

~mv7~

But we know that lots of these values are logically impossible. So, when events are related, there's this kind of "clumping effect".

~mv8~

So, since clumping = relatedness. All we do is measure these two things at once. And we look for the clumping. If there's clumping then the events are related.

~mv9~

So we just make four different event-derivative markets, and get the market price for each, and then look for clumping.

And so…

~agenda~

…that is the synthesis…

~Arithmetic~

…we can just add and then divide, to make the clumping explicit. So laypeople will never have to see anything complex.

And that is how you get these numbers to show up, the numbers that I showed you at the beginning the of the talk.

~final section~

Final section: why will anyone care.

First of all: "checking the phones" is, of course, a very small ask – these people will be waiting in line to vote; and they'll be glued to their phone the whole time anyway. This is basically the first google result for "voter line", and these people are already on their phones.

~navigate~

So, of course, people will be on their phones, but why will they _navigate_ their phones to this pricing data? Why wouldn't they just ignore it the same way they ignore everything else that falls under the umbrella of research?

~margins~

Well first of all the the electoral victory margins, are very small. And voter turnout is very low.

~turnout~

Basically half the population doesn't vote -- those people could basically form their own political party…and it would be large enough to defeat both existing parties!

~why turnout low~

And non-voters admit that they don't vote, basically because they just don't know what to do.

~accuracy increases over time~

Over time, people will come to see these markets as accurate. We can start lowbrow markets in sports gambling, arts, etc. People will get more comfortable with the institution over time.

~Finally~

Finally, one very last thing to mention, I believe I have 30 seconds left, so this is perfect. In a scheme like this, everything the politicians say is irrelevant. So, skipping to the third bullet point, if a politician *said* that if elected they would kill everyone in the US, that's fine. But unless traders actually believe that they can and will follow through on that, the 'deaths' numbers won't budge an inch. And so people already know that politicians are liars – they will just ignore politicians and start to focus on this.

Ok, that's the talk, thank you!