The History of Longitude: How the UK Funded Innovation

Would you like to win £20,000?

The money comes courtesy of the British government. It's stumping the cash up as part of a competition. Anyone can enter. All you need to do is this:

Show me a way of pinpointing exactly where you are on the planet in a reliable way. On land or at sea. It doesn't matter. Do that and the £20,000 is yours.

The catch is, you can't use GPS, or even use a map. You need to figure it out yourself.

Actually, while we're talking about catches, I should let you know that the year this competition actually began was 1714. So you'll need a time machine, too. But let's ignore that small detail for a second and ask ourselves why the government would offer such a prize.

The answer, you might be surprised to hear, is that in 1714 – the era of Newton, Huygens, Descartes and Leibniz – we still didn't have an accurate way of figuring out where anything *is* on the planet.

To be specific, we could calculate our latitude by observing the stars, the sun and the moon. But we couldn't reliably calculate longitude. Sailing from New York to London, or Manila to Acapulco, we had no way of working out how far across the ocean we'd travelled, without using a landmark (of which there aren't too many in the wide expanse of the Pacific Ocean).

It's a hard problem to solve. But the rewards of doing so, in terms of ever expanding global trade, an important and valuable one. You can't trade with faraway places in a systematic way if you can't navigate properly. The UK government decided to try and solve it.

It's one of the rare cases of government intervention leading to increased innovation. Though clearly I'd argue it was unnecessary. The reward set by the market for anyone who solved the problem would have been more than £20,000, if properly commercialised. But let's leave that aside. The government created an incentive and innovators leapt at the task. As the government put it, as it established the Board of Longitude in 1714:

> *The Discovery of the Longitude is of such Consequence to Great Britain for the safety of the Navy and Merchant Ships as well as for the improvement of Trade that for want thereof many Ships have been retarded in their voyages, and many lost… [and there will be a Longitude Prize] for such person or persons as shall discover the Longitude.*

What became apparent, as different innovators grappled with the task, is that mastering *where* you are (in space) is really a matter of measuring *when* you are (in time).

That's because the Earth rotates at a fixed speed of around 15 degrees per hour, so it's possible to calculate your longitude… if you know the time at a fixed point.

Put another way, so long as you know the time in London, you can figure out the time difference between that and your position in the middle of the Atlantic. From this you can calculate local time, and therefore the distance between you and London.

Bang! You just solved longitude. (That bang was £20,000 in 1714 pounds hitting your bank account.)

The problem is, telling the time at sea was virtually impossible back then. Clocks just weren't up to the task of keeping time accurately on a moving ship. As soon as your clock failed, you were lost (in time *and* space).

How to solve a problem like longitude then? The answer was: better clocks. It took nearly half a century before anyone found a

way of doing that. John Harrison's marine chronometer did what nothing else had done before: it kept the time at sea.

In a journey to Jamaica and back in 1761, the clock lost just a few minutes of time. Harrison won £10k, though he had to fight for it. No one said the government would keep its promises.

That aside, it's a story of the triumph of human ingenuity and innovation. It freed us to explore the world in a concerted way that changed the course of the next century. It's also a technology that has become completely integrated and taken for granted in our lives today, but was revolutionary in its time.

That's exactly the kind of technology we'll be talking about all afternoon on Monday, at our first ever Tech Investor's Symposium. It's a world-class line-up of speakers (plus me). If you've already claimed your ticket, great. I'll see you there. Be sure to hang around for a beer or a glass of wine afterwards.

If you haven't got a ticket, make sure you get yourself a copy of the DVD when it goes on sale.

But that's not the only reason I've written to you about clockmaking and the challenges of navigating an unknown world.

For the past few weeks I've been working with Charlie Morris on his latest ideas for 2017. His strategy is remarkably simple: you cannot safely and profitably navigate the financial system if *you don't know where you are.*

You need a map. That map needs latitude and longitude. What are the equivalents in the financial world?

Turns out, Charlie has a pretty good idea. I guess two decades managing $3bn will do that for you. He boils everything down to two numbers, then uses those numbers to show you where you are, and where to go next. He calls it the "Money Map". It'll change everything for you, if you let it. Follow this link and see what I mean.

Energy price madness

I went for a beer with an energy analyst last night. He was in town visiting family, though he's been based in New York for the last five years.

He confirmed a lot of what I'd already suspected: the energy market is undergoing a step change driven by technology. On the "traditional" side in oil and gas, you have fracking and tight oil changing the supply dynamics.

These firms are getting leaner and more efficient all the time. Where once they could only operate with prices north of $100, now it's more like $55. And it's falling. Opec's attempts to push the price up just makes more shale viable.

What happens when shale is operational at $45 or $35 – does that then become the new "ceiling" on the oil price? And will we ever see oil at $100? That was my question as we stood in the sunshine looking out over Borough Market with a couple of beers.

"It's a good question," he said. *"I just can't see $100 happening the way the market is at the moment. I suppose it could change, but I don't see how."*

"But then you have renewables. Wind and solar – they're the real thing. And battery technology too. That's going to change everything. You have wind farms in Germany that are coming on stream without the need for subsidy. That was unimaginable even a year ago. It's all changing so fast."

(By the way, if you want to invest in battery technology – and why wouldn't you consider it, given what's happening in the market right now – you should follow this link now.)

Obviously we've written about this step change – away from traditional energy supplies and towards new, greener and essentially "unlimited" ones – for over a year. But still, it's always interesting to have the story confirmed from the "inside" of the market.

It's an incredible story that's going to change the world. Which is why it's so depressing that the national debate here in Britain is still stuck in the Stone Age when it comes to energy.

This week Theresa May claimed to believe in a free market, only to follow it up by saying that she'd cap energy prices. She believes in competition, but only when it works, she claims.

Hmmm. Right. I'm sure she's also a vegetarian unless she fancies a bacon sandwich. Or a roast dinner. Or a filet mignon. Actually, maybe she just believes in a "spirit" of vegetarianism, but not the reality. Either way, I'm torn as to whether to describe her as an idiot or merely a hypocrite.

It's sad that, while the market moves on outside Britain, we're stuck with this. No mainstream party truly believes in a free market in the traditional sense. At least Jeremy Corbyn is honest about his anti-competition, anti-market agenda. It might be economically incoherent, but at least he's open about it.

While we're setting energy prices, why not go further? Let's set the wage of an electrician at EDF at the "correct" wage. Let's control the price of the cup of coffee he drinks tomorrow morning. Let's fix the price of Tesco's share price at £6.50 while we're at it. This "economics" stuff is easy!

Like I said, it's a shame. If May wants competition, she should get out of the way. Price fixing is *anti*-competition – why would a new business want to break into an industry where prices are limited? It just entrenches an already cosy cartel of energy suppliers.

That might be the national story, but it's not the global one. The global story is all about falling prices, increasing competition and major opportunity for investors. Want in? Go here first.

Until next time – and see you Monday if you're coming.

Nick O'Connor
Associate Publisher, Exponential Investor

PS You might feel I've been too hard on Theresa May and Jeremy Corbyn. For what it's worth, in the spirit of libertarianism, I don't think either make a particularly compelling case for the future of the nation. They're both big-state, authoritarian-type figures.

Neither truly believes in free markets, personal liberty, small government or sound money – the principles Southbank Investment Research exists to defend. You might not agree with everything we say, but I'd like to think we're at least consistent in our philosophy – which is more than you can say for most (all) political parties.

If you think I was too hard, or perhaps too easy, on either politician, feel free to write in and tell me. I'm on nick@southbankresearch.com.

Right – I need to go write my speech for Monday. Enjoy the weekend!