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A RAIL BETRAYAL

OPINION: Why Scaling Back HS2 Was The Wrong Decision

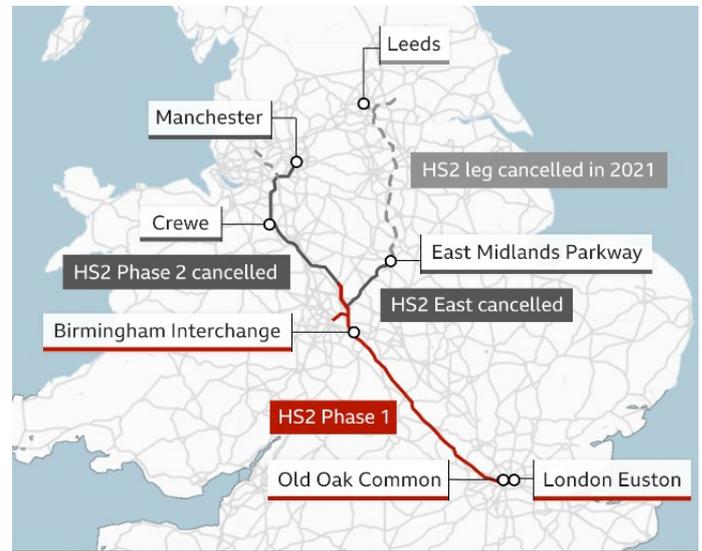
By Sam Walshaw

In a speech to the Conservative Party Conference in Manchester this October, Prime Minister Rishi Sunak announced the latest scaling back of the flagship High Speed 2 (HS2) rail project. But this decision somehow felt different to previous ones, bigger and more terminal. In this article I will seek to explore why the government came to this decision, and what the consequences of it might be.

Let us begin by considering the history of high-speed rail in this country. After several false starts, the Channel Tunnel between Britain and France was given approval in the 1980s and completed in 1994. This resulted in high-speed Eurostar trains whizzing across the continent and through the tunnel, only to trundle through Kent on the same tracks as commuter trains. It became clear that a dedicated high-speed line to London was required; the line, named High Speed 1, was finished in 2007 and terminates at London St. Pancras. Then, in 2009, British operator Southeastern began operating domestic high-speed services over HS1 tracks.

The idea for a second high-speed route first gained traction in 2006, with the coalition government announcing in 2012 that HS2 would go ahead in two phases. Phase 1 was planned to run from London to Birmingham; phase 2a from Birmingham to Crewe; and phase 2b from Crewe to Manchester and Birmingham to Leeds. It was hoped trains would continue on upgraded conventional tracks to destinations like York, Newcastle, Edinburgh and Glasgow. The project was controversial, with the media promoting a message that the main reason for its existence was shaving a few minutes off journey times from Birmingham to London. The cost was projected to be more than £28 billion, with £14 billion set aside for 'contingencies'.

By 2015, this had risen to £55.7 billion; costs continued to spiral and HS2 became beset by problems. Then-PM Boris Johnson gave the line his full support in February 2020, before his spinelessness was exposed in November 2021 when the leg from the East Midlands to Leeds was cancelled. The decision, widely condemned by industry figures and local politicians, left cities like Bradford and Leeds totally abandoned. Things continued to worsen. Though construction had begun, further delays were announced this March before October saw one of the worst-kept secrets in politics confirmed: after days of denial, and protestations by politicians of all ilk, HS2 was cancelled north of Birmingham and destined, in the medium-term, to terminate at Old Oak Common rather than London Euston.



Source: hs2.org.uk

BBC

As with many major infrastructure projects, HS2's problems over the last decade have been caused by constant chopping and changing. Had the project been given full unequivocal approval and sufficient money set aside ten years ago, with the plan stuck to throughout construction, costs would not have spiralled in the manner we saw. Instead, it was reviewed and re-reviewed to death, and gradually scaled back such that, assuming it does get built, the line will reach only a pale shadow of its potential. Constant fear of change meant industry bosses and construction workers were kept in the dark over what was actually happening, and a generation of skilled railway employees has been lost.

The social argument in favour of HS2 is clear. Rather than reducing journey times (though it would nonetheless have done that for many journeys), the main reason behind the project is one of capacity. The West Coast Main Line (WCML) – and not to mention every other main line in the country – is full to bursting and, even though demand exists for more trains, they cannot be timetabled. Transferring the fastest passenger trains onto a dedicated high-speed railway will free up space for stoppers and freight trains on the WCML, promoting a 'modal shift' from cars to the railway. And this is where the environmental case for trains comes up strong: getting cars off the road is absolutely critical and many anti-HS2 environmentalists don't seem to understand this. If the decision to cancel north of Birmingham was done for cost reasons, why allocate that same money to other piecemeal projects afterwards? Even worse, much of the cash is set to be spent on upgrading our roads – a smack in the face to all of us who believe in rail.

Other countries can do it. But sadly, as shown time and again, Britain lags behind its counterparts in delivering large-scale infrastructure projects. We succeeded (eventually) with HS1, but building HS2 in full proved a step too far. This was not a vanity project, but a generational chance to smash down the walls of the north-south divide that so plagues our country. And we failed.

What's your view on HS2? Email me on 17swalshaw@heckgrammar.co.uk



LET'S
CONSIDER...

ARE GOVERNMENTS QUALIFIED TO MAKE SCIENTIFIC DECISIONS?

In light of the revelations coming out of the COVID enquiry, we consider if it's right to allow underqualified governments to make scientific decisions.

By E. Hoyland

"Politicians don't understand science", Boris Johnson "bamboozled" by science, politicians saying the scientists are "wrong". These are just some of the revelations coming out of the COVID enquiry in recent weeks and it seems that a rather large number of the decisions made during the pandemic pitted politicians against scientists and the politicians, it seems, won, leading Rishi Sunak to say that we ought to "just let people die." This then raises the question as to whether seemingly underqualified politicians should be making scientific decisions or whether the people in charge of our country be more qualified.

A prime example of this alleged underqualification is our ministerial system: our education secretary has never been a teacher and was in fact, prior to her current position, Minister for Care and Mental Health. I find it difficult to believe that she is an expert in one of these fields, never mind in both. Likewise, we have recently seen James Cleverly moved from Foreign Secretary to Home Secretary and one must once again wonder to what extent he is qualified for either of these roles given that the extent of his education is private schooling followed by a degree in hospitality management from Ealing College of Higher Education. Other examples of this underqualification in terms of education include the Minister for the Environment, whose time in higher education was spent obtaining a law degree, or our net zero minister, who has a degree in maths and philosophy.

That said, these are politicians and, referring back to the COVID enquiry, it would seem that if it were up to just the scientists, we would have seen a more significant dint in our already fragile economy and even more job losses. And therein lies the complexity of this debate because whilst we can safely assume that the scientists knew far more than the politicians with regard to the facts and the statistics, there is a reason that they are not in charge of running the country singlehandedly and a reason that this responsibility falls upon politicians.

And so, with this in mind, I suppose that the question we are really trying to answer is whether this fine balance is currently being achieved, and I would suggest not. If our Prime Minister at a time of national crisis is 'bamboozled' by the science, he needs to swallow some pride and relinquish just a little responsibility to those

gifted enough to understand a bar chart or two. Similarly, I find it baffling that our Net Zero Minister, in charge of tackling what many agree is the greatest challenge of our time, has absolutely no relevant education or prior knowledge of the topic.

Surely our political and ministerial system could only benefit from the requirement of at least some relevant expertise?



Chris Whitty said at the COVID enquiry that he was working with people who "had at best half-understood the issue"

The House of Lords has members appointed on the basis of expertise in a relevant field. This is certainly not always the case (just look at the gracious Lord Cameron), but surely an improvement on the Ministerial one. Now, I am not suggesting that Professor Chris Whitty should necessarily be our next Healthcare Minister, but what I am certainly suggesting is that such an important role should not be designated to a man with as little relevant knowledge and skills as Matt Hancock.

"THERE'S A CRACK UP IN THE CEILING, AND THE KITCHEN SINK IS LEAKING"

A Report On The Impending Global Debt Crisis

By Fatima Babar

Right now, the world is on the cusp of another detrimental debt crisis. The past fifty years have seen four waves of debt, of which three resulted in crisis. The fate of the last, which began in 2010, is yet to be determined but so far, it is not looking good. This article will examine, in particular, the disconcerting changes in the American financial world because they are intricately tethered to the global economy as well as problems the entire world faces.

In the USA, levels of and defaults and delinquencies on debt are at their highest levels since the 2008 financial

crash – a trainwreck when coupled with inflation and rising interest rates, with supply chain shocks coming out of the pandemic, and with Western sanctions and geopolitical conflicts with China and Russia. In the first few months of this year, three of the four largest bank collapses in US history occurred, at Silicon Valley Bank, Signature Bank and First Republic Bank.



Image Credit: REUTERS/Brittany Hosea Small

There is a larger looming crisis with the commercial real estate market free-falling (again). According to a recent report by Bloomberg, Morgan Stanley (a US investment bank) has estimated that the valuations of office and retail properties could fall by as much as 40 per cent, which would rival the declines in the 2008 financial crisis and could have major shock waves across the rest of the U.S economy: in many urban areas, the local economy is built around commercial real estate.

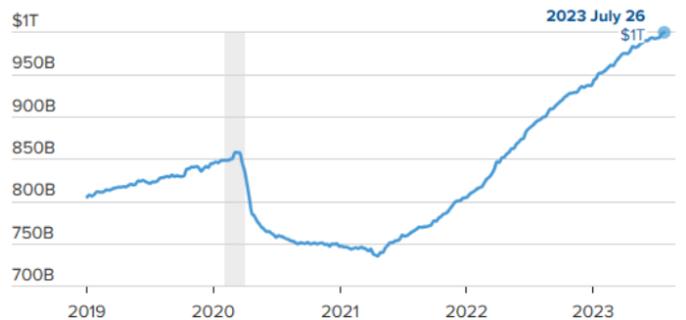
The average credit card interest rate, already at a record high of 20.69 per cent, is going to climb to criminally high numbers. The cherry on top – student loan payments that were paused for over three years due to the pandemic have resumed since October. Increasing numbers of people are deciding whether to pay their credit card bills, their rent or to buy groceries. Furthermore, consumers are now turning to buy now, pay later services to cover necessities such as groceries because of the rising price of food. They are taking debt to pay for food. This kind of debt has surged by 40 per cent in just the first two months of 2023. Moreover, according to the New York Federal Reserve, there are 70 million more credit card accounts open than there were in 2019 and Americans’ total credit card debt has topped one trillion dollars for the first time.

The aggravating factor is Consumer Price Index inflation which, in the past few years, has dramatically increased, mostly due to the shocks to supply chains caused by the pandemic and associated lockdowns. Furthermore, the war in Ukraine and the Western sanctions on Russia, one of the world’s leading producers of oil, gas, wheat, and fertiliser, led to commodity prices rising extensively.

What does this mean for the world? According to a report by the Institute of International Finance, the world’s

debt-to-GDP ratio rose to 356% in 2020. The debt-to-GDP ratio is an economic metric that compares government debt to gross domestic product (GDP) and is typically used to determine the stability and health of economy. The afore-mentioned figure does not bode well for national economies and the global economy, with the US serving the first domino in a predictably catastrophic chain reaction.

Weekly totals of all credit card and other revolving loans at U.S. commercial banks



Note: Seasonally adjusted
 Shaded area shows the Covid recession
 Chart: Gabriel Cortes / CNBC
 Source: U.S. Federal Reserve Board via FRED
 Data last published Aug. 4, 2023



Image credit: CNBC

ALL I WANT FOR CHRISTMAS IS...

Two More Years Of English And Maths!

By Anna Truman

At the beginning of October, Rishi Sunak announced his plans to scrap the current A-levels and T-levels and replace them with the proposed ‘Advanced British Standard’ (ABS). If this new baccalaureate is implemented, the average student would spend an additional 195 hours (15% extra) per school year in the classroom. It would also mean that the number of subjects taken per student would increase from three to five, with maths and English made mandatory. The Prime Minister hopes this will increase the literacy and numeracy rates of school leavers, as well as giving students the opportunity to study a wider range of subjects. The available subjects would consist of both academic and technical options and be sorted into ‘majors’ and ‘minor’ subjects, with majors going into more depth than minors. Apprenticeships would still be offered to those who want to take that route, but they will still be required to study maths and English.

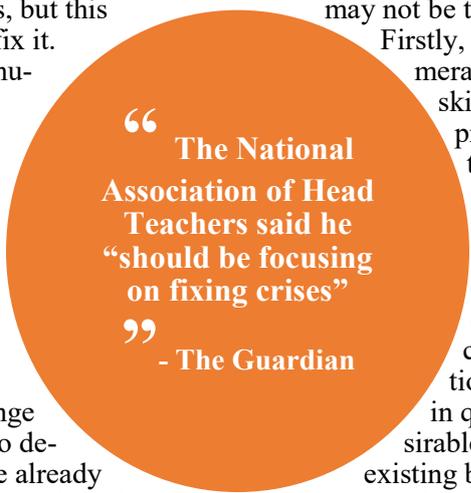
Why do we need a new qualification? Recent statistics have shown that a third of school leavers have not passed maths (35%) and English (30%) at GCSE level. Plus, almost half of the adult population have the same level of numeracy skills as a primary school child. Most jobs require basic numeracy and literacy skills, and Sunak wants the ABS to address the lack of ability in these areas – it is estimated that adults with poor numeracy are more than twice as likely to be unemployed at age 30. The ABS would be implemented in the hope of

bringing British students up to the standards of their international peers. It would also give students a simpler choice and more flexibility at 16 to decide their pathway, as it would provide students with choices in both technical and academic subjects.

However, Sunak has received a great amount of backlash for his proposition. It has been labelled as ‘pie in the sky’ or, as Labour termed it, an ‘undeliverable gimmick.’ Yes, there are problems within the education system, no one is denying that, but the PM’s new plan does not address some of the more imminent problems. Increasingly, students (particularly in maths and the sciences) are being taught by teachers with no degree or expertise in that subject and are being hindered because of it. Since Sunak wants to roll out maths for everyone up to the age of 18, that only adds to the problem of teacher shortages. Around half of 16–19-year-olds currently take A-levels, and around a quarter of these study A-level Mathematics. This means roughly 88% of 16–19-year-olds who are not being taught maths will now need a maths teacher. This is a big problem and one that won’t disappear, and there is no guarantee that the required teachers would materialise. With inflation rising and teaching salaries low, there is very little to incentivise those with a maths degree into teaching, especially because they can find jobs elsewhere which offer higher salaries and better working standards.

The government has invested an initial £600 million over two years into teachers in further education, colleges and schools to help lay the groundwork. But will this really help? Much more money will need to be invested to make the new qualification a reality, but with the instability of the economy, the lack of consensus over this matter and the coming general elections, there is no surety of whether it will work.

It’s not to say that education does not need any changes – it does, but this may not be the best way to fix it. Firstly, if a child’s numeracy and skills are still a problem when they take their GCSEs, likely to be dealt with earlier in a child’s education. Also, in qualifications such as the International Baccalaureate that are available to choose from and that would not require a fortune to use.



Not all the PM’s ideas are bad, nor his worries unfounded, but careful consideration and discussion are required before any major changes take place. It is a long-term plan that would take at least a decade to put into place, so nothing should be rushed, as will have very important and permanent effects on the lives of future children.

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HOUSE EVENTS

$$\frac{\sin(s)}{s} = \left(1 + \frac{s}{\pi}\right) \left(1 - \frac{s}{\pi}\right) \left(1 + \frac{s}{2\pi}\right) \left(1 - \frac{s}{2\pi}\right) \dots$$

Simplify:

$$\frac{\sin(s)}{s} = \left(1 + \frac{s^2}{\pi^2}\right) \left(1 + \frac{s^2}{4\pi^2}\right) \left(1 + \frac{s^2}{9\pi^2}\right) \left(1 + \frac{s^2}{16\pi^2}\right) \dots$$

You may notice that the coefficients of π^2 is the same as our original series, with these if we want to turn one series into the other, we must factorise:

$$\frac{\sin(s)}{s} = \left(-\frac{1}{\pi^2} - \frac{1}{4\pi^2} - \frac{1}{9\pi^2} - \frac{1}{16\pi^2}\right) \dots s^2$$

$$\frac{\sin(s)}{s} = -\frac{1}{\pi^2} \left(1 + \frac{1}{4} + \frac{1}{9\pi} + \frac{1}{16}\right) \dots s^2$$

We find that inside the brackets is our original series, so we can once again represent it how we did with the summation function:

$$\frac{\sin(s)}{s} = -\frac{1}{\pi^2} \sum_{n=1}^{\infty} \frac{1}{n^2} s^2$$

Since the coefficient of s^2 was shown to originally be $-\frac{1}{6}$ we can equate the coefficient of s^2 now which is:

$$-\frac{1}{\pi^2} \sum_{n=1}^{\infty} \frac{1}{n^2} \text{ to equal } -\frac{1}{6}$$

Divide by:

$$-\frac{1}{\pi^2} = \times - \pi^2$$

Therefore:

$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

As we can see it converges:

$$\frac{\pi^2}{6}$$

Lots of proofs and methods, such as the integration test can be used to see if s converges. However, to prove when:

$$s = \frac{1}{2} + bi = 0$$

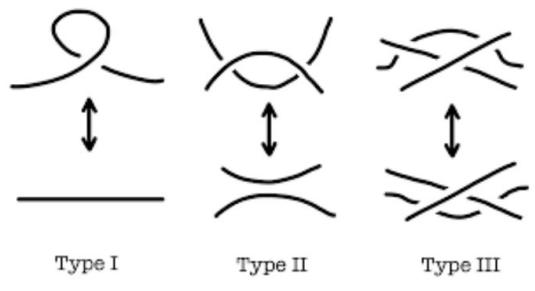
is much harder. Not only is this problem of great difficulty but it is believed that the distribution of prime numbers is closely related to the function itself. By solving this hypothesis, the secrets of primes may be unravelled, and we can gain a better understanding of the fundamental building blocks of Arithmetic. The elements of Maths.

KNOT THEORY

By Hannah Batley

Mathematical knots were first studied by Carl Friedrich Gauss in the 19th century but were

theorised in the late 18th century by Alexandre-Theophile Vandermonde, and is a theory which has developed significantly over time. Unlike normal knots, mathematical knots do not have a 'tie off' point and instead are endless and cannot be undone. There are many ways knots can be identified, some of which are: The crossing number. They are the minimum number of times a knot can cross over itself within an image. For example, an unknot which can be identified through it being shaped like a ring has a crossing number of 0, whilst a trefoil knot has a crossing number of 3. To obtain the crossing number the knot has to only show the minimum number of crossing points within the knot, this can be obtained through a mixture of 3 moves called the Reidemeister Moves which was a set of rules proven to untangle knots in the 1920s by Kurt Reidemeister. These moves are: twist/untwist, poke/unpoke and slide as shown in the image below.



Another method of identifying knots is through the Dowker-Thistlethwaite Codes which were developed in the early 20th century by Clifford Dowker and Morwen Thistlethwaite. This process is done by getting a photo of your knot and then choose a direction numbering each crossing until getting back to where you started originally. At each point there should be two crossings which are paired up into brackets and are presented as (a,b). Then the odd numbers would be put in order and the code would consist of the even number pairings. For example, if the pairings are (1,4) (3,6) (5,2) then the final code would be 462.

Alongside these there are other ways such as the writhe, which is a way of assigning a number to a knot by giving the cross sections either a +1 or -1 value, which when together at the end give a numerical value to represent the knot. There are also knot polynomials, which is a method of being able to see whether or not two knots are the same even if the configurations of the knot are not exact-same. polynomials these are examples of how knots can be identified just the start of it and as time develops more. Overtime the theory has been developed and changed as new discoveries and new mathematicians bring to light new ideas and theories which alongside past ones can provide new explanations for things previously unknown.

“

Knots may be regarded as formed by interlacing and looping a piece of string in any fashion and then joining the ends.

”

- Britannica

