Speculations on Infrastructure: from colonial public works to a postcolonial global asset class on the Indian Railways 1840-2017.

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ABSTRACT

This article issues a challenge to examine the current emergence of infrastructure as a global asset class against a longer term colonial history of speculation. Taking the case of the Indian railways it shows that their current financialization and transformation into a logistical network emerges from colonial techniques of calculations of risky frontiers, state guarantees and debt accounting. Historical forms built from racial and national inequalities have been incorporated into a new era of the financialization of public works led globally by the World Bank. This new moment erases the distinctive political histories of public works, while also capitalising on these. Overall this leads to two theoretical claims, first that we should only use the term 'infrastructure' self-consciously as a mode of critique of such contemporary moves. Secondly that our theories derived from Marx, Foucault and Callon place too much emphasis on 'economisation' and that we need to replace this with attention to speculation. Speculation is affective, intellectual and physical labour that aims to direct capital towards various ends. It involves the ethical imagination of social differences and places distinctions of race, nation and gender at the core of calculative regimes. This labour is governed by key nodal contracts between the market and the state and associated accounting and legal regimes or treaties for accumulation.

KEY WORDS: INFRASTRUCTURE, SPECULATION, DEBT, RAILWAYS, PUBLIC GOOD

Since the 1990s a crisis in the financing of infrastructure has been declared by national governments and international organisations. Like most declarations of crises this has generated political and financial experiments in intervention (Roitman, 2013). Since 2014 these initiatives have become more urgent due to the challenge of China's One Belt One Road Initiative. In India these longer term debates have led to recent developments in the state railways. In 2016 Suresh Prabhu, the BJP minister, used his annual railway budget speech to announce an expansion of lines and increasing of PPPs (Ministry of Railways 2016). Global and national private capital would be deployed to create logistics planning, freight corridors and high speed trains to serve international markets. The financial forms that support this project cement ties to Europe, America, Russia and Japan as a counterpoint to China's growing influence. These are funds such as the Indian Railway Finance Corporation (IRFC) and the National Infrastructure Investment Fund (NIIF) backed by government guarantees that issue rupee denominated debt bonds into the London, Singapore and Bombay stock exchanges. As well as allowing private extraction from the Indian railways these are invested in by political organisations such as the British government, JICA, the Asian Development Bank and Russian quasi-governmental corporations. Both the IRFC and the NIIF are now circulating as successful models for overcoming a global 'infrastructure deficit' in World Bank and IMF reports. In this article I demonstrate the importance of situating these current initiatives in a longue durée analysis. In India these experiments directly capitalize on the legacies of colonial relations—representations of India as a risky frontier for capital; techniques of state guarantee; and debt accounting. More broadly many current experiments in infrastructure finance capitalize on the past, present and future of large-scale circulatory networks, which were once public works.

A longue durée analysis is particularly important because debates and polices since the 1990s erase the history of public works in order to financialise circulatory networks. This erasure is achieved by the creation of a universal global thing called 'infrastructure.' This is then treated as a single asset class that has no specific history or material form. An asset class is a group of financial instruments that have the same essential qualities because they 'behave similarly' in financial markets. Infrastructure is assumed to have a shared quality of long-term financial returns based on a statistically diversified series of material forms and lack of sensitivity to inflation pressures. In this article I disrupt this discursive erasure of history and materiality by focussing on the longue durée of a single circulatory network--the Indian Railways. At a theoretical level by connecting colonial history to contemporary financial accumulation I demonstrate that we need to revise our approaches to financial practices and to infrastructure. As I will explain next at the core of my intervention is a critical deployment of the concepts of speculation, infrastructure and timescapes of circulation.

On Speculation, Infrastructure and Timescapes of Circulation

Turning first to speculation, this concept moves beyond the split between theories centred on technical calculations in financial markets and those focussed on the ethics of capitalist practices. During the past eighteen years, Callon's approach to market devices has stimulated research across the social sciences. This performativity school emphasizes the power of practices of calculation held together by technical networks (Callon, 2006; Beunza & Stark, 2012; Kjellberg & Hegelson, 2007; Muniesa, Millo & Callon, 2007). Another approach influenced by Foucault examines how ethical practices and human agency create the 'spirit of capitalism' (Appadurai, 2011; Miller and Rose, 2008; Rudickyi, 2010; Zelizer, 2010). More recent work has started to construct a middle ground between these positions by deconstructing the determining power of technical devices and models. It shows that

calculative devices become entangled with popular ethics (Weszkalnys, 2011; Dunn, 2005) and moral attitudes of belief and doubt (Maurer, 2002; Miyazaki, 2007; Zaloom, 2004). It demonstrates that models are affected by the cultures of policy institutions and arise from their practices (Farias, 2014; Svetlova, 2012). It is clear it is no longer useful to have separate theories to explain, on the one hand the technical and, on the other, the ethical practices that are both part of capitalist action on the world.

The decade since the 2008 financial crisis has increased scepticism about these separate streams of theory. There has been a rejection of the "hagiography" of expert knowledge implicit in a focus on calculative practices and performativity (Bryan et al, 2012). Importantly financial markets have been shown to involve ignorance, clashing knowledge systems and narratives (Beckert, 2013; Leins, 2018; McGoey and Davies 2012; Tuckett and Chong, 2014). The crisis has also shaken the agnostic approach to accumulation that has been characteristic of work in the vein of Callon and Foucault (Pryke & Du Gay, 2007). My article constructively theorises this intermediate position between Callon, Foucault and Marx by a turn to the analysis of speculation.

Why, then, is speculation such a useful concept? Speculation overcomes the dichotomies between calculative and ethical approaches and between attention to financial market techniques and their social effects. Speculation, is future-oriented social action that uses technologies of imagination to generate accumulation. From it emerges a durable arrangement of extraction. This is held together by mediating institutions such as financial markets, management consultancies, accountancy firms, government institutions, nodal legal contracts and media spectacles. Through these mediations there is an attempt to coordinate and draw attention to speculation. Speculation is a form of affective, discursive and physical labour that evokes and then resolves the uncertainty and instability of value (Bear, Birla, & Puri, 2015). This labour uses practices of valuation and evaluation in order to: anticipate,

stimulate and control the future. In some ways speculation is akin to divination as described in the anthropological literature. Like divination it invokes an invisible ethical realm and makes it visible in order to explain the past, present and future and to generate agency (Sneath et al, 2009; Da Col & Humphrey, 2012; Graeber, 2012; Nielsen, 2014). In fact it rests on a dynamic play between visibility and invisibility. This play creates a superabundance of meaning through the use of symbolism (Tedlock, 2006; Werbner, 1973). Most importantly speculation creates truth-events by bringing "relevant meaning trajectories together" apparently "by coincidence" (Holbraad, 2012). Calculative devices are part of speculation, but importantly they do not, as Callon assumes, act like Austin's performative utterances that found worlds (Butler, 2010; Callon, 2010).

My alternative focus starts with a different claim--that economics and economic action emerge from speculation on ethical orders and life-processes. This speculation aims to accumulate from human and non-human vitality. This future-oriented action reproduces relations of circulation, labour and social reproduction. Most importantly it is a prospecting that is oriented by concepts of race, nation and the social at its core (Bear et al, 2015; Ho, Rofel, & Yanagisaiko, 2019; Tsing, 2015, Yanagisaiko, 2002). Through a focus on speculation, therefore, we can rewrite our accounts of capitalism from a post-colonial position. As I will show this becomes particularly clear by tracing the history of financing forms for the Indian railways.

Turning next to infrastructure how am I deploying this term critically? It is striking that during the same period that infrastructure has become a key global problematic it has also become a focus across the social sciences. In anthropology important research has explored the forms of political life that emerge in relation to it (Anand, 2017; Barnes, 2014; Bear, 2007; 2016; Bjorkman, 2015; Carse, 2014; Collier, 2011; Fisch, 2013; Hetherington & Campbell, 2014; Knox, & Harvey, 2015; Larkin, 2015; Pia 2017; Von Schnitzer, 2016).

Within geography, ANT and STS approaches make visible the nonhuman material ground for human sociality (Barry, 2013; Simone, 2004). Yet there has been little consideration of how the problematic of infrastructure has become so widespread across our field-sites nor of what kinds of accumulation it is associated with. Instead infrastructure has been treated as a neutral theoretical term. Rather than taking it for granted, I will trace the genealogy of infrastructure to the attempts by the World Bank (WB) since the 1990s to privatise public works and turn them into a global asset class.

Importantly both speculation and infrastructures exist in relation to timescapes of capital circulation. Marx addressed these issues in Capital Volumes II and III in which he analysed the UK Railway Mania of 1842-7 and the railway share collapse leading to the Overend Gurney bust of 1869 (de Paula, et al, 2012). On the basis of these events, Marx argued that fixed capital was a key site of contradiction in the circuit of capital that produces ever-increasing crises. This was because fixed capital in the instruments of production and transport worked on a different rhythm in time from the circuit of commodities (Capital: Volume II). First it draws capital out of circulation and slows down the realisation of surplus value. Secondly once this fixed capital becomes a physical form it is in a similar position to that of the labourer. Surplus value is extracted from it with no process for the return of capital for its full reproduction. Marx argued that these contradictions were temporarily fixed by the redeployment of the social (and non-human) product of profit being reissued in bills of exchange and coupons. Yet this ‘solution’ Marx argued inevitably results in further issuances of financial contracts in chaotic speculation. This ultimately creates an expropriation and centralisation of capital by speculators and financial institutions.

What are the potentials and limits of Marx’s theoretical insights on the timescapes of capital circulation? His focus on the contradictions in time of fixed capital and the problem of the physical renewal of circulatory networks in capitalism is significant. It allows us to

understand why issues around the provisioning of, and repair of these, have recurred in historically emergent forms since the mid-nineteenth century. But what Marx did not anticipate is how productive these contradictions have been for the creation of arenas of market and state action. In fact his exploration of the boom and bust of the railways in 1844-7 is part of a historical moment in which this process began. Such scandals were widely understood as showing the necessity for greater legal and government intervention in the market. Indeed Marx developed his own critique into the ethical vision of rational socialist state planning. Marx had identified *productive* contradictions in time. Renewed projects of accumulation and legitimacy emerge from the ruins of older vast circulatory networks.

All of my theoretical interventions come together in a discussion of timescapes of capital circulation and speculations on large scale circulatory networks--specifically railways. Such vast projects will have a different dynamic of provisioning fixed capital from for example, decentralised networks of roads, a single factory or port. In particular railways, as Mitchell has pointed out in relation to the US, demand central coordination and capture of future income (Mitchell, 2014; Abourahme & Jabary-Salamanca, 2016). Mitchell argues that such projects were the foundation for durable forms of corporate power and capitalization in the US. But even more significantly plans for railways and similar vast networks generate key contractual nodes between the market and the state revealing the hidden "political activities of formulas" (Shafiee, 2012). Such financial agreements are not *just another* economising or marketising device that generates commodities and pricing. They create the potentials for, and arenas for contestation of, the legitimacy of state, market and financial practices (similar to the nodal contracts associated with state debt, Bear 2016). To deploy Marx, Foucault or Callon's approaches alone would only provide a partial understanding of these political-economic treaties for accumulation. Importantly too, analysing such treaties helps us to track the structuring of capitalism without positing deep logics or a determining

force (Bear et al 2015). Instead we can trace the nodal agreements that create potential for speculative action and suture together directional flows of capital and power over long periods of time. We will be able to track this dynamic in the history of the Indian railways.

Before entering this history, I would like to re-emphasise the theoretical significance of its coloniality and post-coloniality. By telling the story of capitalism and railways from India, it is possible to reveal a significant fact underplayed in the theories of Marx, Foucault and Callon. This is that economization and financial instruments have at their centre evaluations of race, nation and the social. This is why Marx, for example, failed to predict the effects of the Indian railways claiming that they would result in a caste-less, economically driven and class-based society leading to revolution (Bear, 2007). It is only by using a broadened theoretical concept of speculation rather than economisation or economic value that we can capture the reality of capitalism. Now we can enter the Indian history of financial formulae for the railways with new theoretical eyes. As we will see particular extractive formula were created because India was figured as an unpredictable *frontier for capital* (Tsing 2003). We will then trace two other key moments in the historical emergence of treaties for accumulation on the Indian railways. Each of these moments created the potential for speculations on global infrastructure in the present.

The Indian Railway Guarantee: Colonial Public Works and Speculations on Race 1840-1850

When plans for the Indian railways began in the 1840s the railway lobby and East India Company officials stood on opposed sides in their application of economic theories to India. It would have been impossible to predict that the outcome of their speculations would be a financial formula that directly tied together their legitimation. Yet as we will see the problem of fixing capital in large-scale, long-term circulatory networks drew these classes together in the formation of a racialised capitalism.

The railway lobby was an alliance of Midland manufacturers, the banking sector and engineer entrepreneurs. This group were inspired by the political economy of the journalist James McCulloch. Influenced by Ricardo, McCulloch had long campaigned against all forms of monopoly and direct government regulation of economic affairs.[1] In the context of India McCulloch argued for free trade and an end of East India Company monopolies. The railway lobby initially proposed private railways to enable an extension of commercial liberty.

On the other side were government officials in the East India Office and the Board of Trade. For them India was a place where tight government regulation was necessary. They were influenced by James Mill and John Stuart Mill's economic theories as well as debates about the government regulation of the UK Railway Mania. James Mill in his position first as assistant examiner of the India correspondence and later as head examiner provided the orthodoxy on how to produce a thriving economy in India. A strong government was the key to moral and material progress. Security of person and property needed to be provided by a fair, incorruptible bureaucratic and legal system. The taxes raised by the government should be limited within the range of a 'scientific tax.' Following Ricardo this tax was just the proportion of wealth in society that was due to the 'natural' differences in the agricultural fertility of the soil. This would be spent by the government on public works to increase the material and moral progress of the population. In India—a frontier for capital—with different social mores the effects of centuries of misrule and irrational taxation had to be overcome. Similarly the use of income for religious and other non-productive activities had to be gradually eroded. This pattern of spending created a particular problem in India. There was no capitalist class who could act as productive investors. Zemindars and peasants were squanderers of resources who spent lavishly on marriages and religious rituals. John Stuart Mill continued his father's approach working in the office of the Examiner of the India correspondence from 1822 to 1858. Speculations on the social qualities of the Indian

economy legitimised East India Company officials. They had to bring a market economy into being by judicious government action.

How then were these opposed interests and visions brought into alignment? Railway investors and government officials combined their efforts as a result of the speculative spectacle created by the engineer entrepreneur, Rowland MacDonald Stephenson (Thorner, 1950). He had trained as a civil engineer and was a secretary in a steam ship company that had campaigned for the right to transport passengers and goods to India. When this company was unsuccessful Stephenson shifted his focus to railways. Initially in 1840 his vision was a global scheme. He planned to, "girdle the world with an iron chain, to connect Europe and Asia from their furthest extremities by one colossal railway" that would stretch as a "National Highway" through France, Germany, Austria, Turkey, Persia and 'Baloochistan' into India and China.[2] Stephenson reluctantly, gave up this plan after touring Europe in 1850 due to political obstacles. However his smaller-scale plan for Indian railways was motivated by the same enthusiasms. When he first proposed it to the London offices of the East India Company in 1841 they were sceptical. So in 1843 he went to Calcutta to persuade the officials of the Government of India directly. This was the beginning of a campaign, which ended in 1849 with the granting of permission to the East Indian Railway and Great Indian Peninsula Railway to build in India backed by a state guarantee of income.

To explore how Stephenson achieved this alliance we can turn to a document that was crucial to his success. In 1844 he published a pamphlet *Report upon the Practicability and Advantages of the Introduction of Railways into British India*. This precipitated a change of opinion in the Court of Directors. It also caused a sensation among potential investors producing a truth event. This was generated by evoking an uncertainty of value and then resolving this through a combination of valuation and evaluation. Stephenson begins the pamphlet by acknowledging the doubts of investors who are unsure they can secure a return

from enterprises in India because of its peculiar social mores. The remainder of the text resolves this uncertainty by invoking the profitability of colonial rule and the certainty of returns through racial hierarchies. Stephenson reassures his audience that the profits from the proposed Calcutta to Mirzapore line would exceed the 11% return on capital invested in the Birmingham to London railway. This was due to, "the level country throughout India, from the absence of any heavy Parliamentary expenses, from the cheapness of labour and materials, and from the moderate cost of the land, if purchased by the Government of Bengal for the Company as being applied to a public work."[3] One of the main expenses for railways in Britain were the legal suits with and compensation paid to landowners (Kostal, 1997). Stephenson suggested this would not be a problem in India where the government could forcibly seize land. Similarly the lobbying of MP's for support for railway company schemes would not be necessary in autocratically governed India. The poverty of the population offered the advantage of low wages. He claimed that these 'advantages' would reduce the expenditure to £8000 per mile rather than the average £36910 a mile spent in Britain on constructing railways. Stephenson clinches his argument with an ethical evaluation. He insists that to 'safeguard' the interests of British shareholders the railway must at all times be managed from London and supervised by Europeans. When Stephenson sent his pamphlet to the Board of Control at the end of 1844 he put a request at the end of it. This was for a legal contract between the government and the shareholders of railway companies that they would have a guarantee of a 4% dividend from the Indian taxpayer on the capital invested. This formula condensed the valuation and evaluation at work in Stephenson's pamphlet. It guaranteed capital accumulation for railway companies and their shareholders, while also legitimising the East India Company's racial command over their Indian subjects.

From 1844-1849 arguments over the form of the guarantee continued, but eventually the solution was close to that proposed by Stephenson. The railway companies would receive

a guaranteed rate of 5 % interest on the capital they deposited with the government for the 99 years of their contracts. Companies could decide to end their contracts if the railway did not prove profitable and the shareholders would receive back all their capital from the Government of India. To give the government some control they could reconsider their agreements with companies after 20 years of operation. If the government paid treasury revenues to cover the guarantee this was treated as a debt relation to the railway company to be repaid in surplus years. Any surplus would go half to the company and half to the EIC. Shareholders in the railway companies could legally convert their investment in the companies into tradable debenture shares in the London Stock Exchange. To support the companies the Government used its powers to seize land for the railway companies. Through the railway guarantee capitalist enterprise, colonial governance and financial markets were drawn into a nodal relation. The Indian railways were run through evaluations of class, gender and race (Bear, 2007). Importantly the railway guarantee didn't perform or create an economised sphere of action or world. It converted socio-political inequalities and evaluations of racial capacity into secure capital flows and financial trading. The first ten companies formed consolidated into the East Indian Railway, Great Indian Peninsula Railway, Eastern Bengal Railway, Bombay, Baroda and Central India Railway, Sind Punjab and Delhi, Madras, South Indian and Oudh and Rohilkhand Railways which all had 90% of their shareholders and their boards of directors located in the UK.

Indian Railway Debts: Colonial Public Works and Speculations on Economic Nationalism 1920-1949

The railway guarantee resolved the problem of fixing capital long term in the 'frontier' of India. However it did not ensure the railways' profitability or resolve the recurrent problem of renewing circulatory networks. For the first twenty years most of the railways made a loss. By 1869 the Indian taxpayer had subsidised the profits of British

shareholders to the sum of 30 million pounds (Hurd 1983). From 1870-09 the Government of India briefly tried to counteract this draw on its revenues by constructing small branch lines directly. But they quickly reverted to new lines built and operated privately with a slightly lower guarantee of profits of 4%. From 1870-90s when the original company contracts came for a second round of renewal the Government tried to rebalance relations again, but this did not end subsidies from Indian subjects' taxes. For example in 1879 the Government purchased four-fifths of the shares of the East India Railway Company with a reformed board of directors holding the rest under a 25 year contract with any profits shared in the same fractions (Bogart & Chaudhary, 2011). British shareholders and financial markets still benefitted from the new arrangements. The price paid for the shares purchased by the Government of India was calculated at the average financial market value of the railway company's stock in the preceding three years with payments made as 4-5% annuities to the stockholders. Each year until the 1960s Indian government tax revenue was paid to holders of East India Peninsula Railway, Great India Peninsula Railway, Eastern Bengal Railway, East Indian Railway, South Indian Railway, Scinde, Punjab and Delhi Railway Company shares (Bank of England). This produced more than a century of accumulation in the UK from the original contracts of the 1840s. Crucially the post 1879 financial arrangements did not solve the problem of fixing capital for the renewal or expansion of railways either. Companies could request capital for this purpose but this was rarely granted as it added to Government of India debt. Chronic under-investment intensified during the First World War due to the heavy demands on government expenditure.

Given these burdens on the taxpayer and the failures of investment, economic nationalism from the 1870s was catalysed by challenges to the legitimacy of colonial railway finance. These made the current regime of value uncertain and speculated on an alternative ethical and calculative order. This evoked the potential of a collective Indian national body

politic served by native capital and an independent government. From this critique emerged a practice of railway financing that used flows of capital to realise political debts owed by a national government to its citizens. This economic nationalism began with the truth event of Dadabhai Naoroji's "Poverty of India" composed in 1873. As a young man Naoroji worked as a professor of mathematics at Elphinstone College in Bombay and then joined University College London as a lecturer in Gujarati from 1856-65. He also worked at the first Indian led trading company in Europe, Cama and Co, leaving this to create his own cotton supply firm in 1862. In "The Poverty of India" Naoroji shocked by the devastating Indian famine of 1873 used accounting to make uncertain the regimes of value associated with British rule. He precisely quantified the exact drain of wealth that led to a vampiric theft of the wealth of India. The railways were crucial in his argument, especially as they were often described as a benevolent gift to India. Naoroji showed that the investment of English capital in India for railways caused drains on its resources to the sum of £66,000,000 per year.[4] Naoroji demanded instead the employment of native agency and capital in the Indian railways. In the 1880s Naoroji's arguments generated a full-fledged alternative speculation on the potential future of a national economy. They were adopted by the Indian National Congress and Naroji served as its president during this period.

This economic nationalism grew in force through the 1890s to 1920s. For example Romesh Chandra Dutt's *The Economic History of India,* published in 1903 even challenged the material form of the railways as a realisation of the illegitimacy of British rule. Dutt was one of the first two Indians appointed to the Indian Civil Service and leader of the Indian National Congress in 1899. He used his experience of dealing with famines and cyclones to write a PhD thesis at UCL that turned into his 1903 book. In this Dutt argued that railways were built in India rather than cheaper and less environmentally damaging canals because colonial governance was driven by a public in Britain. Dutt calculated the exact monetary

loss to the Indian taxpayer that this represented.[5] Dutt's discussion of the drain of wealth was used by nationalist politicians such as Gokhale to challenge railway policy during the Annual Railway Budgets. By 1917 these arguments became central to the imagination of an interventionist national government that would overcome colonial exploitation and the inequalities of Indian society using new kinds of economic theory. Ranade was the most influential advocate of this approach. Ranade was a judge under the Deccan Agriculturists' relief act from 1887 and as a result he argued that India was an agricultural colony held back by British rule and traditional practices. [6] His approach was given an institutional home when Gokhale founded the Ranade Institute of Economics in 1908. The Indian Industrial commission of 1916-18 fully realised these arguments in policies that were realised in the post-1947 planned economy.[7] Railways should be reoriented to a political project of serving the Indian public and developing an independent economy. Reversing the racialized evaluations of British rule the report argued that through such measures and by following the example of Japan, 'Asiatic races' too would be able to achieve progress.

These nationalist speculations coupled with the recurrent contradictions in the funding of renewal and construction produced a crisis among colonial officials. In response in 1921 the Lieutenant-Governor Harcourt Butler convened the Acworth Committee. This aimed to create greater popular consent to colonial rule through reforms to railway finance and control. The commission was led by the conservative politician and barrister turned railway economist Sir William Acworth, who lectured at LSE from the 1890s. He had advised the German, Rhodesian and Canadian governments on railway finances. Based on his admiration for the US railways his usual remedy was private railway companies. Yet in India, he pushed the committee to a different solution suited to the evaluations of the social and racial character of the Indian economy (Acworth Report, 1921). Here railways could not be handed over to Indian private companies and banks. Indians were not yet 'ready' to invest large

amounts of capital because of their habits of squandering resources on consumption. Nor could foreign capital be used to finance Indian owned firms as investors in the UK would consider it too risky to place their funds in them. The committee conjured again the uncertainties of value on the frontier of capital that Stephenson had seventy years before. These evaluations were condensed into a new managerial and financial agreement for the railways. The government would take all railways under its authority in order to administer the repayment of debt to international investors. But it would not intervene in the commercial running of the railways, which should be left to corporate principles of profit and loss.

Following the recommendations of the Acworth Committee up to independence in 1947 the Indian Railways were gradually taken under government control as pre-existing contracts expired (with compensation again paid to shareholders). A new railway department was set up with a separate budget from the rest of the government so that railways could be run according to commercial principles. The railways were then tied to the government through financial debt. The state would borrow capital at current market rates of interest from European banks and pass this on as needed. The railway companies would pay back the interest on these loans annually. This arrangement was realised in the minutiae of the railway accounting structures. These accounts consisted of three elements: a capital at charge account, which listed debts to the government; a block account that listed their assets and a separate depreciation reserve fund (DRF), which would have added to it annually 1/60th of the value of capital at charge. The DRF would be used to fund asset replacement at the level of their original cost. Any further cost due to inflation would be covered by further government loans and placed as a debt in the capital-at-charge accounts of each railway. Given the inevitable decay of circulatory networks and of inflation debt to the government for asset replacement would inevitably grow. Once again the problem of fixing capital in

railways had not been resolved. Instead it had become a productive basis for a new kind of commercial debt like relation within state-railway accounts.

The contradictions of these commercial debt like relations between the Indian railways and the state stopped at Independence. Monetary debts began to be treated as political gifts to the future of the nation. Following the arguments of economic nationalism under Nehru the railways were given an explicit social purpose. They would be used to overcome the disadvantages of the social conditions of India. They would provide state employment, low fares for mass travel and tariffs to stimulate exports and develop internal markets. Reflecting this, alterations were made to the debt structure of their accounts. Railways continued to pay an annual dividend to the government based on the amount held in their capital at charge account at a rate slightly higher than the average borrowing rate of the government. But importantly any funds spent on improvements were no longer listed as part of this debt (Sririman, 2000). Such renewal of circulatory networks was paid for from the DRF. The DRF was replenished annually from railway revenues according the amount needed to renew the network in the following year. The post-independence financial formulae gave the railways gifts of fixed capital which would never need to be repaid. In return the government received from the railways an annual political tribute for redistribution. These activities were separate from those of international finance. The government would use monetization (or creation of money by the central bank) and limited amounts of market borrowings from Indian banks. This is a triumphant reversal of the original colonial guarantee and the Acworth Committee reforms, which deployed political relations (of taxation and colonial rule) to secure accumulation by European companies, banks and financial markets. The post-independence accounting used flows of capital and credit to create national political relations over the long term.

Railways as a Global Asset Class: Infrastructure and Post-Colonial Speculations on Global Finance 1980-2018

For three decades the Indian railways were public works funded by national political debt relations. What new speculations on the Indian economy altered this arrangement? These began in the mid-1980s as a class of WB and IMF technocrats joined the highest levels of the Indian government (Bear, 2016; Ghosh 2006). During this period Indira and then Sanjay Gandhi relied more on WB and IMF loans and the expertise of former IFI employees. From 1968-1981 an entrenched understanding of India as held back by Hindu fatalism and a socialist state permeated the World Bank as Robert MacNamara drew on the economic theories of Raj Krishnan and Kakkadan Nandanath Raj to argue that India had a low Hindu Rate of Growth (Gould, 2010). Ironically these theories of India's difference began as a justification of the role of technical elites and socialist planning (Shiviah, 1993). However under MacNamara WB officials repurposed this into critiques of India's socialism and national 'difference.' From 1986-1995 under both the Republican politician Barber B. Conable and the ex J.P Morgan Banker Lewis T Preston these accounts of the backwardness of India were combined with policies of structural adjustment and reduction of state economic control. In these speculations the state and its holding of public debt were represented as a corrupt political starving of the forces of market enterprise. Influential ex-WB and IMF technocrats such as Rakesh Mohan (economic advisor to the department of industry 1988-96) and Manmohan Singh (Chief Economic Advisor 1972–76, Reserve Bank governor 1982–85, Planning Commission head 1985–87, Finance Minister 1991-6) and Montek Singh Aluwalia (Ministry of Finance 1979-1998, 1998 Member Planning Commission) introduced these speculations into public sector strategy. [8] They applied a new fiscal discipline to the post-independence regime of political debts pressing down on the public services to pay down WB and IMF loans early. This turn was consolidated during the

liberalisation reforms of 1991, which led to the control of all top level ministry posts by IMF and WB trained economists. Elite technocrats returned to the legitimising mission of colonial officials. They should overcome the opaque differences of India or its 'Hindu Rate of Growth' through government intervention to stimulate markets and private enterprise.
On the Indian railways this post-coloniality went beyond a similarity in justifications for elite governance. Officials directly revived colonial techniques. The Acworth committee accounting structure was reactivated to discipline through debt. From the mid-1980s the contributions made by the Indian government to the DRF fund of each national railway for repair and renewal counted again as part of their debt to the government. Once again the Indian bureaucracy was modelling its practices on commercial forms of debt. Importantly this move also revived the problem of replenishing the railways. As time passed and the railways needed to be renewed or expanded debts to the government would *automatically* grow. The contradictory rhythms of fixed capital would lead to an unresolvable ever-increasing 'debt crisis' (Ministry of Railways, 1983; 1993; Planning Commission, 1998).

How then was this debt-crisis dealt with? It first became the foundation for national financial accumulation and a growing private financial sector. Technocrats in the Railway Convention Committee and Ministry of Railways looked for a 'solution' to the 'debt problem.' In 1987 the Indian Railway Finance Corporation was founded in order to raise financial market credit within India for the purchase of new rolling stock for the railways. The IRFC took debt bonds for rolling stock, which was then leased to railway lines to provide regular *non-taxable* income for the bond holders. This proved to be a very costly solution for the railways, but profitable for bond holders. From the 1990s three quarters of the borrowing of the IRFC was taken out in order to pay for already existing leasing charges owed to other bond-holders (Sririman, 2002). This had highly problematic effects. Railways suffered from

old rolling stock, decaying stations and increasing accidents that drew growing critique from politicians, the press and the public. They now had a new purpose though, to support the tax-free growth of private citizen speculators and banks. Like the Indian Infrastructure and Leasing Company set up under the auspices of the government in 1987 for other sectors by former development banks the IRFC was designed to deepen financial liquidity tax free.

How then did the Indian railways become re-articulated to networks of international financial accumulation and institutions? This was a longer process that began with the global truth event of the 1994 WB's Report on Infrastructure for Development written by the president Lewis Preston and WB economists who had worked on urban development and privatisation especially in Latin America (Antonio Estache, Christine Kessides, Gregory K. Ingram, Ashok Mundy, Michael Bruno, Peter Lanjouw and Lant Pritchett). This provided a solution for the dilemma that had emerged from WB public debt policies—a world-wide degradation of public works. This report made the value of public works uncertain and generated speculation on a new global form named infrastructure provisioned by markets and international finance. Public works were defined as a private good consumed by populations exactly like any other commodity. The state should therefore no longer provide them. Private sector and informal forms of provisioning will always be more flexible, efficient and contribute to growth. Diverse 'case studies' about quite distinct kinds of networks with different histories were all made to point to an essential global commodity form. For example treated together as infrastructure were: the Indian railway guarantee from the 1840s; the privatisation of ports in Malaysia; water provisioning in Cote D'Ivoire; and of telecoms in Mexico in the 1990s (World Bank, 1994). Infrastructures would be judged by the extent to which they served 'consumers' and enabled growth through globalisation and outsourcing. What then was post-colonial about this speculation on the potentials of infrastructure? The

report sounded a note of caution about the frontiers of capital. It argued that barriers to international investment lie in the specific social conditions of various countries. Nevertheless these risks can be overcome through special agreements for investors *in just the same way* as they were in the nineteenth century government guarantee for shareholders in the Indian railways. The colonial extraction of the railway guarantee was represented as best practice.

The 1994 report had an immediate effect on the new liberalisation regime in India. The Congress Party government of India under P.V. Narsimhan Rao with Manmohan Singh as finance minister created an expert group on infrastructure in 1994 led by Rakesh Mohan. The Indian government for the first time named all its public works as infrastructure and joined their fortunes to international investment. In a reversal of the hard-fought battles of economic nationalism it proposed a return to guarantee-like contracts for international investors. Given the considerable risks to investors, the government should use its resources to 'crowd in' private investment by taking equity shares in private projects or by guarantees to shareholders (Government of India 1997). This aim was realised in the Infrastructure Development Finance Company (IDFC) which was set up in 1997. To overcome the riskiness of India the government of India and the Indian Reserve Bank held 40% of the equity and 60% was held by the World Bank, Indian financial institutions and foreign investors. This provided a combination of direct lending, purchase of loans and co-financing, take-out financing, refinancing, partial credit guarantees and securitization of infrastructure loans. Mohan was later vice chairman of this institution for a crucial period from 2000-1. The problem of fixing capital would now be resolved again through state guarantees to international investors to overcome the frontier of capital in India. To support this public debt repayment would continue so that the Indian government would appear a responsible financial agent to investors (Ahluwalia, Montek Singh, 1997).[9]

The move to turn public works into infrastructure continued under both Congress and BJP governments. The BJP rejected the Hindu rate of growth speculating instead that the Hindu majority could create abundance if liberated from the control of a corrupt, secular, socialist state. But the BJP drew on the same elite ex WB economic expertise as Congress, applied debt discipline and argued that the railways should be commercially oriented and transparent to private investors. During his tenure in 2000 the BJP prime minister Atal Behari Vajpayee asked Rakesh Mohan to convene a committee on the railways. Mohan assembled experts such as the chairman of Tata R. Gopalakrishnan, the head of McKinsey Kito De Boer and the Railway Finance Commissioner P. Ragagopalan. Mohan drew on his WB research on private infrastructure in Bogota and application of structural adjustment policies in the Philippines to use the accruing debts of the railways to argue for an end to their social purpose. They should focus on high speed logistics and transparency for investors. A highspeed rail network should be built in the Delhi-Kolkata-Chennai-Mumbai-Delhi Golden Quadrilateral. A change to commercial accounting in the railways according to net present value would enable financial transparency for shareholders and managerial targets. Workforces should be reduced by 20% (Expert Group on Indian Railways, 2001). These suggestions met strong resistance from politicians, railway bureaucrats and unions. The Indian Railwaymen's Federation threatened to go on an immediate and indefinite strike if the reforms were implemented. The railway bureaucracy feared the repercussions if the new accounting structures were implemented. Employees in the railways at all levels were still driven by a strong ethic of national, social purpose (Bear, 2007). Nevertheless, even though these reforms were not implemented, railway debt continued to automatically increase. The people who most paid for this were railway employees, whose numbers were reduced by 330,000 between 1991 and 2011. The degradation of the railways continued too with a chronic lack of investment.

At global nodes the WB continued its discourse on infrastructure particularly focussed on India. In 2000 a Public-Private Partnership Infrastructure Advisory Facility was set up, which had as one of its first reports an account of Indian 'opportunities.' In 2006 this subdivision published a report on the challenges facing private investment in Indian infrastructure. The frontiers of capital could be made more attractive by: a massive expansion in the corporate bond and derivatives market; the ending of government red tape; and the implementation of regulatory regimes that favoured investors (Finance and Private Sector Development Unit, 2006). In fact the WB push focussed on advising governments in how to create risk-mitigating structures for international investors setting up an International infrastructure Advisory Facility in Singapore (Farquhasan, et al, 2010). India was in the spotlight in these projects. By 2010-11 India had become the largest receiver of private investment in infrastructure in the developing world receiving 43% of the total private investment in developing countries (Public Private Infrastructure Advisory Authority, 2011). To aid this investment the Indian administration created a uniform definition of 'infrastructure' across all government departments. The institutions that mediated finance movements were the Infrastructure Development Finance Company, the IF&LC and further government guaranteed vehicle set up in 2006 The India Infrastructure Finance Company Limited. So lucrative was this trade that the IDFC and IIFC joined with the global private equity company Blackstone in 2007 to attract USD 5 billion to Indian projects. The Indian government under Manmohan Singh set up a further fund of funds backed by government guarantees, the Infradebt fund in 2013 (Government of India, 2010). It received AAA ratings from Moody's and other agencies because of its Ministry of Finance backing. Between 2013-17 it raised 800 million dollars in rupee denominated bonds. The government support for such funds was still not always seen as sufficient to overcome the risky frontiers of capital in India. As an influential City of London report on Indian infrastructure put it in 2012,

particular barriers still exist: uncertainty in the regulatory environment, failures to enact economic and financial reforms and taxation of indirect investments. Such reports are, like Stephenson's from the 1840s and that of Acworth in the 1920s, an attempt to draw the state into an alliance with international financiers on the basis of the peculiar qualities of India. Mentioned as positive developments were: a viability gap funding scheme that provided government funds to back risky PPPs and the formation of infrastructure debt funds with more favourable tax terms. Further changes were called for that included making it easier to acquire land, to get environmental clearances and creating a stream of 'bankable' projects. There is now no economic nationalist accounting of the flows of income captured or extracted within or outside India from building roads, airports, housing and ports. Nor any sense that infrastructure were once public works with a social purpose. Instead the WB and international financiers have joined with Indian governments to press for greater financialization of Indian circulatory networks. These exist for the twin goals of logistics and for circulation and accumulation in national and international financial markets.

Given this 'success' it is not surprising that attention has turned again to the railways. In 2013 Prime Minister Manmohan Singh asked Rakesh Mohan to convene a National Committee on the Development of Transport Infrastructure. This renewed the vision for the railways of 2001 on a grander scale calling for a complete reorientation of the railways towards commercial logistics. Six dedicated freight corridors should take the straightest route possible even through protected tribal lands reviving the colonial autocratic public authority over land. There also should be a more radical privatisation than ever before in the railway's history. Suburban lines should be hived off and run by local state governments in PPPs. State run railway workshops should be privatised. Stations and land should be sold off to private owners. Funding should come from government backed financial vehicles and banking intermediaries that allowed international investors to have confidence in the risky frontier of

India. Suresh Prabu's recent policies for Indian railways in the Bibek Debroy Report (2015) and 2016 railway budget replay these speculations on the railways. This is not surprising given his earlier service in the BJP government from 1998-2004 when as Union Minister for Power he introduced privatisation into the electricity sector. What is new is a more specific account of the guarantees to be offered to international investors as demanded by the WB and investors, made much easier by the lifting of restrictions on foreign direct investment through PPP in August 2014 (notification N.S.O, 2113). In 2016 to ensure the consent of the powerful and previously resistant railway bureaucracy and unions to reforms Suresh Prabhu brought the railways under the central control of the finance ministry and government fiscal responsibility acts. Piyush Goyal who replaced Prabu in September 2017 is pressing forward with this vision. Subsidies to special classes of passengers and to the transport of essential foods and suburban lines are now described as 'social burdens' that impinge on railways' viability (2016, Niti Ayog). Railways now print the subsidy provided on each railway ticket issued to the public to make them aware of a financial 'crisis.' PPPs have expanded into the direct operation and construction of railway infrastructure. Most recently with General Electric, Bombadier and Alstrom winning contracts for the construction of engines, electrification and other vital elements of the new freight corridors (Swaminathan, 2017).

The direct post-coloniality of this project of infrastructure is visible in the conversion of railway debt into forms of international financial accumulation. The debt in the IRFC was born from the change back to colonial Acworth Committee accounting structures in the railways. This debt has now been financialised in two ways. The IRFC has been incorporated into the larger National Infrastructure Investment Fund backed by Indian government guarantees. Founded in 2015 this is a fund of funds. It is a trust that raises debt on the equity of sub-organisations thereby allowing another tier of rentier income (http://niifindia.in/). As a trust there is no tax on the income it gives to its investors. Returns to investors are guaranteed

by the presence of 49% of Indian government money in each investment product up to a level of 20000 crore per annum. The fund has also taken on quasi planning roles as it vets projects for investment and prepares a pipeline of future projects with commercial viability. It now has investments of over $800 million and issues international bonds on the London Stock Exchange. The first investors in this fund have also included other quasi market-state forms. They include RUSNANO, a Russian company (whose CEO is appointed by the president), Dubai Ports (which is backed by the Dubai government's sovereign wealth fund) and Abu Dhabi sovereign wealth fund (Ministry of Finance Press Information Bureau, 2018). Secondly the debt in the IRFC has also now been directly connected to international stock markets. In December 2017 it issued its first green bond on the London Stock Exchange (London Stock Exchange, 2017). This would run for ten years at a fixed rate of return of 3.85 percent and would be invested in the creation of dedicated freight corridors and passenger transport. The bond was three times oversubscribed and received an investment of $500 million. And the capital does not of course go directly to the railways, but sustains other rentier structures--of the IRFC bondholders, who are also under the rentier structure of the NIIF. In 2019 this was followed up by a standard overseas bond offer of $500 million at a yield of 2.23% on the London Stock Exchange. Here we have the emergent nodal contracts between the market and the state. The state guarantees international financial markets rentier returns on capital and reforms its laws so as to give as favourable an institutional and tax environment for financial capital as possible. This has generated an effervescence of speculation with reports being issued by Black Rock, Morgan Stanley, Accenture, Arcadis and McKinsey in 2015-17.

Even without the direct privatisation of the Indian railways, they are now a global financial asset class. Accumulation is invisible in the records of national and international capital flows and is sheltered by the confidential shells of private contract law. Foreign

governments and investors are once again accumulating from India's railways, but these have now become infrastructure. They exist for logistical efficiency and for the growth of national and international financial institutions. This trend for government guarantees or the socialisation of private risk and guarantee of private profits across all sectors is only intensifying. This is driven by the recent near collapse of the only relatively government independent infrastructure investment vehicle the IIF&LC in October 2018. This threatened a Lehmann style banking crisis, which was resolved by taking IIF&LC under the Reserve Bank of India to guarantee its continuing profitable operation.

Conclusion: For New Speculations

The longue durée of the Indian railways raises crucial questions for our most widely used theories of capitalism. Work in the vein of Marx, Foucault or Callon cannot fully capture this history or its significance because it assumes that capitalism—and in particular its contracts and calculative devices--operate through a narrowly defined economic valuation of the world. Any divergences from this are described as varieties of capitalism or cultural/historical additions to a central economising discourse or series of techniques. But if, as they should be, apparently 'anomalous,' 'peripheral' or 'frontier' sites such as the Indian railways are taken as a central to global capitalism this theoretical view is undermined. Instead economic theories, contracts and calculative devices are show to contain within them wide-ranging speculations on racial, social and national potentials. Once this is recognized it is possible to trace the connections between forms of global financial accumulation in the past created from colonial capitalism and those in the present. In the case of the Indian railways definitions of frontiers of capitalism, forms of government guarantee and debt accounting recur in historically emergent forms and are directly capitalised on in a post-colonial present. Indian technocrats, International Financial Institutions, national banks, global financial markets and foreign governments all accumulate capital and power from the long term-history of colonial

public works and their reconstitution in the present. There have, of course, been many empires including those of the US in Latin America and post-socialist societies, Japan in South-East Asia, the socialist empire of Russia and current formations around Middle Eastern sovereign wealth funds and Chinese capital and debt. Importantly each imperial formation and its legacies will create distinct representations of difference, redeploy techniques and treaties for accumulation in different ways and will generate distinct vectors of accumulation. However significantly international financial institutions including the WB, IMF, Asian Development Bank and New Development Bank are central mediators of these speculations.

The history of the Indian Railways reveals too just how productive the timescapes of circulation are for the generation of nodal treaties for accumulation between the market and the state. The problem of fixing capital in the construction and renewal of large-scale circulatory networks has been resolved in four distinct ways in three crucial moments in this history. First in the 1840s by state guarantees that legitimised colonial rule and accumulation in the UK that founded the prosperity of the London stock market. Secondly in the 1920s by forms of disciplining by debt to legitimise the role of a colonial government that also ensured returns to international banks. Thirdly in the 1940s-mid 1980s by a political accounting that aimed to generate a national economy. Fourthly from the mid-1980s to the present a return to disciplining by debt and state guarantees to develop private financial accumulation and institutions on a national and international scale. At each stage there has been the emergence of a long-term structuring of power from the degrading ruins of public works and attempts to solve the problem of fixing capital in these. This historical process is entirely hidden within the discourse on infrastructure generated by the World Bank, Indian Government and Financial Institutions. It is also hidden inside the technical forms used to value infrastructure. This shows again why we cannot use a solely Marxist, Foucauldian or Callonesque approach

to capitalism. The problem of the dispossession of public works and accumulation from infrastructure cannot be captured by attention to a separate form of economic value, discourse or calculative device alone. This dispossession and accumulation occurs as a result of wide-ranging speculation that includes within its techne both evaluation and valuation. This produces timescapes of capital circulation and non-human forms that regenerate persistent inequalities.

It is clear as well from this history that infrastructure cannot be treated as a neutral theoretical term. Its unity has been constructed by International Financial Institutions, government committees, global investors and market consultancies. The marketization of public works and their transformation into a global asset class is secured through the legal definition of all of a nation's circulatory networks as infrastructure. In addition the similarities between the celebrations of the new visibility of infrastructure in the 1994 World Bank Report on Infrastructure and its ubiquity as a theme in the social sciences is striking. This report salutes its emergence from being the "gray backdrop of economic life—underground and out of mind." (World Bank 1994: 12) and improvised provisioning by the poor in ways that are very similar to our sociological and anthropological approaches. If we are to continue to use the term infrastructure it should be deployed in a critical genealogical engagement. We can use it to reveal the new rentier forms of extraction hidden by private contract law and to challenge the ways in which our state institutions legitimate financial market action and accumulation. We live in a time when we need again evaluations and valuations like those of Indian economic nationalists. We need to track drains of wealth and accumulation from infrastructure financing. We also need to rethink public finances as political gifts of time and to imagine public-public partnerships. Some counter-moves are underway, in particular the Eurodad, Jubilee Debt and European Association of Actuaries challenges to the World Bank promotion of infrastructure PPPs. But we need much more

wide-ranging speculations on infrastructure to re-orient our circulatory networks to the public good.

All of these insights have arisen by deploying a new critical understanding of capitalist action as speculation. To rephrase Callon the economy is not embedded in economics--economic theory, heuristics and action are embedded in speculation. As we have seen throughout the history of the Indian railways speculation is stimulated by productive uncertainty. Exemplary figures such as MacDonald Stephenson, Naoroji, MacNamara, Preston and Mohan make visible a vast invisible realm of ethical forces in truth events where multiple forms of symbolic meaning are conjoined. As a result of these attention is drawn to potentials and possibilities. Different social groups mobilise around these to capture capital and power through the creation of treaties for accumulation. Once these are created durable forms of extraction are generated. These persist until another productive uncertainty is created from contradictions in the timescapes of circuits of capital and non human-human relations. Current forms of governance, as we have seen in the account of the transition of the Indian railways from public works into infrastructure increasingly demand more speculation from citizens. They are part of the creation of a redistribution of capital from the control of governance into the hands of private financial institutions that incite all of us to undertake forms of speculation in credit, pension protection and insurance. Now it is not an exaggeration to say that the commons of circulatory systems built from and supported by tax-payer revenues exist for financial institutions and that we all incited to become citizen-speculators. The political relations and capital accumulation built from these social-non-human relations are more spectacular and present in our lives than ever before. And at the same time their contours have never been so hidden and difficult to trace as they are protected by private legal regimes, are off the books of national treasuries and involve pension,

sovereign wealth and equity funds. It is this play between visibility and invisibility that generates intensifying speculation. More hopefully it may lead to increasing scandals and demands for political accountability that will question the role of circulatory networks as a global asset class.

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Notes

[1] See William J. Barber *British Economic Thought and India 1600-1858* and John C. Wood *British Economists and the Empire*. Ricardo was also a friend of D. Mculloch. Ricardo was a member of the East India Company's Court of Proprietors.
[2] Rowland M. Stephenson, "The World's Highway" in the *Calcutta Review* (Serampore: 1856), XXVI, 145.
[3] Ibid., p14.
[4] Dadabhai Naoroji, *Poverty and Un-British Rule in India*: p33.
[5] Ibid., 252.
[6] Mahadev Govind Ranade, "Indian Political Economy," *(*1900): 33.
[7] Ibid., 102.

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