Manna from Heaven

Radio Rent Windfalls and the Tax Conversion Fund

Fred Harrison

WILLIAM VICKREY was awarded the Nobel prize for his innovative work in Economics in October 1996. His victories, tragically, came late in life. His work was seriously underrated during his lifetime, especially his studies on the way in which resource rents provided the best source of revenue to pay for public investment in services such as transportation.

Vickrey's first posthumous coup flowed from his work on the theory of auctions. This work inspired Britain's decision to auction third-generation mobile telephone licences which delivered spectrum rents worth over £22bn to the Treasury.

Dr. Vickrey's elaboration of the theory of resource rents will prove to be crucial in the 21st century, as governments struggle with the erosion of their labour-and-capital tax base, and struggle to finance investment in the renewal of public infrastructure. In particular, writes Fred Harrison, Dr. Vickrey's application of the theory of rent to mass transit systems will help to solve problems on issues ranging from road pricing, environmental protection and urban renewal.

In this study, the author focuses on the rents of the radio spectrum as a major source of public revenue. And he explains how, if such revenues were channelled through a Tax Conversion Fund, they would initiate a new economic revolution. This would express itself by removing the ceiling that is clamped on the economy by the deadweight losses of conventional taxes.

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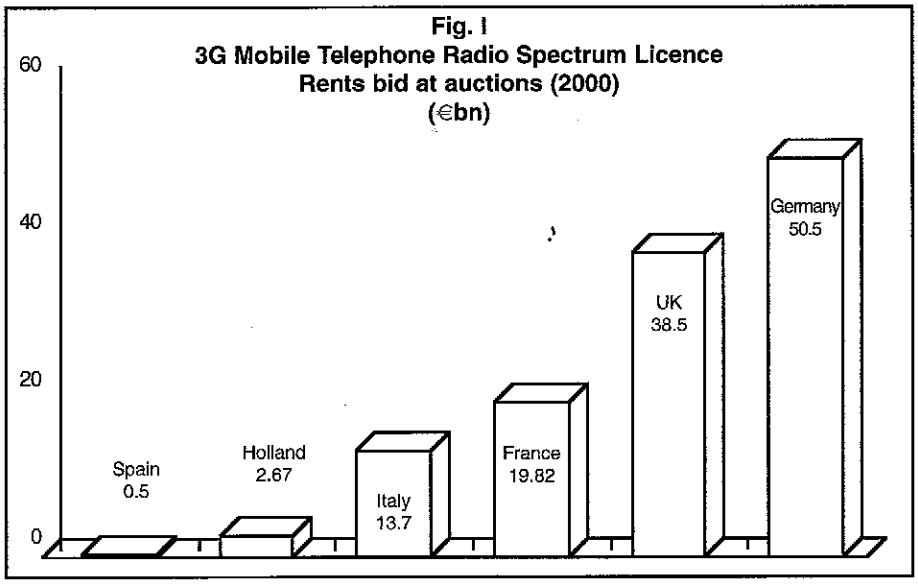
IN 1997 the British government consulted academic economists on procedures for the allocation of the licences that telecommunications companies needed to commercialise their third generation (3G) mobile telephone technology. Access to the finite electro-magnetic spectrum would have to be rationed. The challenge for the academics was to identify the most efficient way to price the licences.

HM Treasury staged its auction in 2000. The outcome for taxpayers – £22.477bn – has been described as the "biggest ever" windfall since the Praetorian Guard auctioned the Roman Empire to Didius Julianus in AD 195.[1] An even larger sum was subsequently bid for licences in Germany (*Figure 1*).



The insights yielded by the intellectual and institutional innovations that led to this spectacular revenue-raising achievement have not been exhausted. In particular, important lessons may be derived that would help policy-makers with the task of refining their fiscal policies.

Taxation has assumed geo-political significance. Sovereign states have discovered that the tax base is a moveable feast – the money is moving beyond their borders and being pocketed by others. A strategy for addressing this problem is central to the viability of nation-states, in an era when extra-political means are being used to solve problems. Asymmetrical violence, for example, is a tool of stateless people who are encouraged by "failing states". How may states-at-risk reconstitute their institutions in favour of social solidarity and economic viability? Public finance is central to this problem. In the age of accelerated factor mobility,

is it possible for governments to redefine the fiscal base in a way that secures a sufficient flow of revenue from locations within their borders? The G3 auctions in Europe identify some important new strategies.

The theoretical framework within which we must locate the testing questions can most fruitfully be traced to the classical economists. Over the past century, however, the concepts on which this paradigm is based have been largely marginalised. Neo-classical economics subordinated natural resources, for analytical purposes, and accentuated a two-factor model (labour and capital).

During the 20th century, however, a few economists ploughed lone furrows. In doing so, they excavated a rich array of insights from which governments may now benefit. One of those researchers was William Spencer Vickrey, a Columbia University professor of economics. His achievements went largely unsung during his lifetime. Today, we can perceive how the economics that underpinned the 3G auctions represent a paradigm for the reform of state finances in the new Information Age.

William Spencer Vickrey

CREDIT for the achievement of Britain's G3 auction has been generously attributed to William Spencer Vickrey (1914-1996). He was awarded the Nobel Prize in Economics in October 1996, but his work on the financing of public goods such as mass transit systems had not been as influential as he had hoped. During his lifetime, governments persisted in raising revenue by employing tools that delivered inferior results both for private markets and the public exchequer.

The news that he had been awarded the Nobel Prize, he hoped, would give him added influence to promote the economics of optimum public finance.[2] Tragically, Vickrey died of a heart attack three days after the announcement of the award.

But fate was to intervene to rescue his scholarship from relative oblivion. His first posthumous coup flowed from his research into the theory of auctions. This work had inspired others to investigate how markets might be restructured to help firms and governments to identify market prices. The first major application was in the allocation of a natural resource that would enable European governments to capture tens of billions of dollars worth of rents for their exchequers.

I will predict that Vickrey's second posthumous coup will flow from his elaboration of the theory of resource rents. This will prove to be crucial in the 21st century, as governments confront the erosion of their traditional labour-and-capital tax base, and struggle to finance investment in the renewal of public infrastructure. In particular, Vickrey's application of the theory of rent to mass transit systems will help to solve problems on issues ranging from road pricing, environmental protection and urban renewal.

I will explain how rents such as those generated by the radio spectrum and other natural resources will constitute a major – and increasing – source of public revenue. If such revenues were channelled through a Tax Conversion Fund, they offer the potential for a new economic revolution. They would raise the ceiling that is currently clamped on the economy by the deadweight losses of conventional taxes. In other words, the G3 auctions enable us to foresee how the nexus of rent and fiscal policy *could* provide the mechanism that delivers the New Economy – the concept that was touted during the late 1990s, which dissolved in the dot.com bubble of the 21st century.

Counter-speculation & auctions

IN 1961, Vickrey published a paper in the *Journal of Finance* that was ignored for 10 years. "Counterspeculation, Auctions and competitive Sealed Tenders" began with a linguistic clarification. Vickrey noted that "counterspeculation" had not been defined in operational terms. It was "just one more of the empty boxes that rattle around in the economist's cupboard of ideas".[3]

Vickrey wanted to define ways of delivering optimum efficiency in private markets. Efficiency required prices based on the marginal cost of production. Higher prices enabled producers to appropriate more than the costs of production. This distorted consumption and investment, and handed producers monopoly profits that would be beyond their reach under competitive conditions. Vickrey knew that the theoretical solution was not a secret. It had been well elaborated by Henry George in *Progress and Poverty* (1879). Vickrey, a master of the mathematical formulae, translated the solution into 20th century language.

In his 1961 essay he explained that, under certain conditions, a state agency would have to participate by assisting markets to achieve competitive conditions. Their intervention would be in a support role, to enable firms to identify and realise marginal terms for the allocation of resources.

The concept of counterspeculation had been floated in an earlier text by A.P. Lerner.[4] Lerner had failed to clarify how this counterspeculation was to be realised. Auctions – constructed with the aid of games theory – offered the solution, argued Vickrey. Auctions would oblige producers to identify the maximum prices they were willing to pay for the use of resources. Those prices would deliver marginal cost pricing. Consumers would not be overcharged.

But there was more to this than a process of determining competitive prices in private markets. The radical implications embedded in Vickrey's seemingly innocuous excursion into games theory went unnoticed. The introduction of a state agency as a *partner* in the market economy implied a new kind of capitalist order. That agency would not be a state *planner*

that was in competition with – an alternative to – the market. The agency would be a facilitator of the market. Its reward came in fiscal bundles: maximised flow of rental revenue into the public coffers. That rent was the monopoly profit that would remain in private hands if firms were able to subvert the competitive market.

The political and economic significance of this fiscal sub-text is enormous. Vickrey made no secret of his commitment to the reform of public finance. For most of his professorial life he championed the fiscal doctrines of Henry George. Among his peers, virtually no-one was interested. And yet, Vickrey had shown that the cherished norms of capitalism could only be fully realised if we bolted the philosophy of social rent onto the economics of private markets.

Rent theory comes of age?

THANKS to advances in the science of electronics, the rental value of the electro-magnetic spectrum was multiplied by a factor unknown. At first, HM Treasury decided to lease its share of the spectrum by a method generally favoured by bureaucracies – the "beauty contest". Civil servants would define the terms on which the licences were held, and control the allocation of the natural resource to firms that it deemed appropriate.

To assist in this project, the Treasury sought expertise via the Economic and Social Research Council. The contract was awarded to the Centre for Economic Learning and Social Evolution (ELSE), which is based at University College, London. The project was placed under the direction of Professor Ken Binmore.

The Treasury expected to raise between £1bn and £2bn for its 20-year licences.[5] Binmore and his colleagues set to work. The decision had by this time been taken by the Department of Trade and Industry to use an auction to determine the value of the licences. The team at ELSE reviewed the literature and recognised the seminal contribution made by William Vickrey. In an interview in the *Financial Times*, Binmore was to acknowledge: "It was he who proposed the basic design we are using. William Vickrey deserves the credit".[6] For two decades, Vickrey had ploughed a lone furrow. He promoted the concept of bidding systems, but had been assiduously ignored by the establishment that had a lock on fiscal policy. Binmore was to tell the present author: "Without his putting the word around for 20 years or more, there would have been no big auctions".

In the US, the Federal Communications Commission (FCC) had auctioned spectrum licences in 1994. The FCC had been accused of alienating spectrum too cheaply. After reviewing its policies, it adopted the "simultaneous ascending auction" design that had been developed by Vickrey in a 1976 article.[7]

The researchers at ELSE began to explore the fine detail of an auction that would suit British conditions. They realised that some of the earlier procedures employed by the FCC had undervalued public assets, "but [reports Binmore] people who claim that this is true of their auctioning procedures would have a hard job providing evidence to this effect. One thing I discovered when I got into the telecom business is that there are lots of people posing as experts who just repeat whatever it is fashionable to say".[8]

The psychology of speculation

THE British government, as the custodian of the radio spectrum, offered to lease five licences. What were they worth? On March 6, 2000, when the first bids were delivered, telecom experts raised their expectations to £5bn. This would be a pure windfall for taxpayers. As the bids escalated in leaps and bounds, soon passing the £10bn mark, alarm bells began to ring. Was this a price too high? The *Financial Times* (April 3) reassuringly editorialised:

> Governments are much less likely than phone companies to find the right economic price for scarce wireless spectrum. An auction is therefore the most efficient way to allocate the resource, as well as to capture a proper rent for taxpayers.

Perhaps. But Vickrey's project was to isolate and accentuate the role of the pure rental surplus. In 2000, insufficient information was available to objectively measure that prospective surplus income above the costs of production. The telecom companies had not even developed the technology for the 3G mobile telephones, and they had not put the infrastructure in place. How could they accurately anticipate their marginal costs in Year 5, Year 10 or Year 15, let alone Year 19?

By selling the 20-year licences for an up-front capital sum, arguably the public purse would be deprived of a significant flow of revenue as the industry matured over the following two decades. The arguments advanced against the "beauty contest" formula also identified the reasons why firms could not satisfactorily calculate the rents that they were supposed to be offering at the beginning of the 20-year period. The commercial and technological uncertainties were neatly summarised by Binmore and Paul Klemperer in their history of the British bonanza in *The Economic Journal*.[9]

> [H]ow can firms guarantee consumer prices for 5-20 years in the future for products that we may not yet even be able to imagine? Infrastructure investment can be costed, but will it all be useful? How can the government possibly decide who will be most creative? And how could the government monitor and enforce any commitments made by firms? How should the government penalise a firm

> that turns out to be insufficiently creative?, and what should the government's response be to a firm that is creative and develops a product with valuable unforeseen features but above the previously guaranteed price? It is hard to think of a more serious drag on innovation than pre-specifying future prices for products that do not yet exist![10]

Given these imponderables, could an alternative financial and institutional strategy commend itself?

- Could licences be allocated to efficient users while postponing payments into the future?
- Could those payments be linked to the periodical re-valuation of spectrum rents as the markets unfolded over two decades?

The British government decided that one bird in the hand was better than two in the bush. The windfall would be used to reduce the National Debt.

The academic backroom boys who ran the computer simulations were sensitive to the need to optimise the price. As Binmore and Klemperer were to note, "perhaps the most important lesson of all is not to sell ourselves too cheap".[11] The task at hand was to maximise the price that the telecom operators were willing to bid for the privilege of monopolising the electro-magnetic spectrum, under the market conditions prevailing at the beginning of the new millennium.

The psychological context was the feverish excitement generated by the dot.com bubble. This – as it transpired – had reached its speculative height at about the time the bids were being submitted to HM Treasury. The telecom corporations may not have been able to extrapolate the rental value of the spectrum licences over 20 years, but they knew they could reach deep into the pockets of investors who had been beguiled by the electronic revolution.

The prospective bidders had been offered the opportunity to spread their payments over time. They declined, on the grounds that the Treasury was demanding an interest rate based on a higher risk estimate than was considered appropriate by the commercial banks. The bidders chose to pay the full price up-front.

Virtual reality had arrived. Fortunes were being made with dots on a screen. Had the 2000 auction been staged in 1992 – or just two years later, in 2002 – the bids would have been significantly lower. The bids were formulated on the basis of current market psychology, not a realistic appraisal of the flow of rents over the next 20 years. From the point of view of maximising public revenue over the decades to 2020, the G3 windfall may have short-changed the taxpayers of Britain.

From equity to debt

AS BRITAIN'S auction progressed, fears mounted that one of the five winners might default. Analysts warned that the sums that were bid might jeopardise the commercial viability of the bidders. As bids broke through the £20bn mark, investors became alarmed that they would not see a return. The winners were saddled with huge debts that did appear to jeopardise their viability.

- British Telecom successfully bid £10bn more than it had expected to secure its licences in Britain and Germany. In March 2001 it was obliged to go cap-in-hand to the financiers in the City of London to try and cover its debt mountain.

On top of the £10bn for licences, BT would have to invest a similar sum in constructing the networks. This commitment inflated the company's debts to £28bn. Fatally wounded, the company embarked on emergency action. It announced a £5.9bn distress rights issue, which was on a scale that dwarfed all previous rights issues on the London markets. Its bid to raise money came at a time when it announced a post-tax loss of £1.8bn, the decision not to pay dividends and a plan to split the business.

BT's debt-equity ratio escalated from 6.3% in 1999 to 53% in 2001 and 192% in 2002. BT had fallen foul of speculative fever. It had recklessly spent money on new acquisitions. Despite a 300-year history of asset bubbles, the managers of BT failed to tailor its bids on the basis of a realistic appraisal of the rental value of the spectrum over the lifetime of the leases. Chief Executive Sir Peter Bonfield admitted that BT paid more than it expected to secure 3G licences. But it had no-one else to blame – firms were free to offer the best prices they could afford in an auction that was not skewed by government interference.

BT's share price crumbled from £15 at the end of 1999 to £5 in March 2002. This was the price paid for indulgence at the height of the dot.com boom. The telecom companies started lobbying for help. The British government was not sympathetic. E.commerce Minister Patricia Hewitt said: "You cannot have an auction for licences and then, long after you award them, say things have changed and we are going to change the terms of the auction. That would undermine the integrity of all future auctions and land the government in court".[12]

The European Commission signalled a willingness to negotiate a rescue package that might include an extension of the licences and rescheduling payment. But, in Britain, such action would penalise the eight companies that decided the price of 3G licences has risen too high, and had pulled out of the bidding.

The fall-out in Europe EUROPE'S telecom companies were taken aback by the outcome of the British auction. The responses varied between countries.

- KPN, the Dutch telecommunications operator, suffered a similar fate to BT's. It had to sell shares worth over €5bn (£3bn) at a discount of 50% to cut its estimated €22bn debt, following its bid of €8.85bn for 3G licences.
- Germany came to the rescue of its 3G bidders by permitting them to share the same base stations and the antennae that sit on top of them. This relaxation of rules may save operators up to €14bn (£8.4bn), but the network sharing may also limit competition and penalise consumers with higher prices. It certainly reduces the rental payments for relay tower locations.

Denmark noted the implications of the up-front payments. On June 14 2001 its government announced a modification to the 3G leasing arrangements. It deployed a sealed-bid auction. This was supposed to deter the collusion in which some telecom operators had allegedly engaged in other countries. The sealed-bid method was the first of its kind in Europe. Denmark devised incentives to attract bidders with a relatively low reserve price of DKr 500 million ($56m) for each licence. But the most important feature was one that avoided the indebtedness that had crippled firms in Britain and Germany. Successful applicants would pay 25% of the price immediately, and the remainder in 10 annual instalments. The telecom operators would not find themselves strapped for cash at the point when they were investing in their networks. But the weakness of the Danish model was that the rents were fixed for 10 years. There was no mechanism for reassessing the value over the lifetime of the licences. *This meant that the citizens of Denmark would lose rental revenue as the licences increased in value over the decade.*

Spain suffered the consequences of not allowing the telecom companies to set prices in a free market. The government opted for a "beauty contest". Four consortia were charged €520m (£323m). Critics accused the government of giving away a valuable public resource. In response to this charge

- José Maria Aznar's government raised the annual fee 30-fold, from €5 million to €150 million in the 2001 budget. It justified this decision on the grounds that the UK and German auctions had established a much higher benchmark for the value of spectrum.
- The four consortia refused to pay the tax and announced a legal challenge. This caused embarrassment for the government, which then announced that it would reduce the tax in the following year's budget.

The Spanish government's science and technology Minister, Ana Birulés, retreated behind the changed economic environment, offering to adjust the tax rate to reflect new circumstances.

France suffered a similar debacle because the government also opted for a "beauty contest". The government had rashly promised pensioners a €20bn (£12bn) windfall for the national retirement fund. In the event, just two operators purchased licences. They paid €10bn less than was expected by Finance Minister Laurent Fabius. France's fixed price of €335 per head of population was too high for all the licences to find buyers, leaving the country with a 3G duopoly. This left France with the task of finding takers for two more licences.

The unfolding *debacle* ought to have persuaded governments to consult more extensively on how to restructure the auctions in the light of rapidly changing market conditions and the accumulation of new information. Instead, the Irish government decided not to allow the telecom companies to determine the price they would pay. It chose the bureaucratic route. The Exchequer estimated a possible €400 million for four licences. Helpfully commenting in the *Irish Independent* (March 19, 2001), Richard Curran suggested: "If companies can give guarantees on pricing and quality, and they are faced with paying hefty fines for failing to comply, then why not give them the new 3G licences for free?" This commentator did not put a premium on the exchequer needs of his community.

The give-away solution could be legitimised only if taxpayers failed to champion an ethical framework for the distribution of property and income. That framework was not in place at the beginning of the 21st century. Among the victims were the taxpayers of Singapore. In April 2002 the Singapore government – observing the financial chaos in Europe's telecom market – decided at the last minute to cancel the auction of three licences. Instead, it awarded them to the three existing operators at the minimum price of £55m each. Singapore's population is the most technologically sophisticated – and among the richest – in the world. Access to the 3G facility in this market would be extremely valuable. It would take competitive bids to determine values. But the telecom companies were denied the opportunity to declare the prices that they were willing to offer for licences. So, for the time being, we do not know what the rental value is of that resource to the people of Singapore. In Britain, the telecom companies paid £420 for every member of the population for the right to sell 3G mobile phones. They paid £350 for every German, but a paltry £28 for every Singaporean. The price may have been too high in Britain and Germany, but it was too low in Singapore.

The story was repeated elsewhere. When the dot.com bubble burst, the collapse of expectations left taxpayers bereft of the revenue that their governments had expected; and with no means to recover that revenue

over the following two decades, as markets settled down and marginal prices emerged to disclose the rental surplus.

- In Australia, seven bidders registered for 58 lots in the 3G auction. Bids just topped the reserve price, raising A$1.17bn (US$575m) for 48 lots. The government had hoped to raise more than double this sum (A$2.6bn).
- There was a similarly disappointing outcome in New Zealand. The auction for second- and third-generation spectrum raised NZ$134 million (US$55m).

The telecom companies were not the only ones to suffer. Their vulnerability also exposed the banks through the billions in loans; the insurers (most bank loans now have credit-risk insurance); the equipment suppliers and their bankers, bond holders, and the European Union governments through loans extended via the European Investment Bank (EIB). The EIB, for example, lent €2.2bn to telecom operators in 2001.

The primary lesson of this experience is that, while auctions are appropriate for disclosing values in private markets at any given time, the terms of leases need to be redefined. Benchmark values have been established. This provides the hard information that was not available to the British government when it announced its 3G auction. As the telecom giants prepare to launch their 3G networks, the time has come to revisit the terms on which orderly markets may be reconstructed for future exercises in the auctioning of spectrum rights. The current debate in the USA, where proprietorial rights associated with the radio spectrum are controversial, affords the opportunity for the public to engage in an interrogation of the fundamental issues that are at stake. And once again, we will discover that the scholarship of William Vickrey will assist us in the clarification of the central issues.

Big-time pots in Las Vegas

STREAMLINING the allocation process so that telecom companies are required to pay rent as they commercialise the spectrum is the formula that maximises the interests of both shareholders and taxpayers. That is the logic of the paradigm developed by William Vickrey: a partnership between private entrepreneurs and public agencies representing the common interests of all citizens. Would such a model commend itself to investors in the United States?

The leaders of the telecom industry who convened for their annual gathering in Las Vegas in March 2002 were pre-occupied with the looming 3G auctions. The talk favoured the privatisation of the spectrum on the grounds that the free market would deliver the most efficient solutions to the allocation of productive resources.

The penetration of mobile phones in the US, at 40% of the population, is well below the two-thirds level achieved in the UK and Germany. The US prospects are complicated by a highly fragmented spectrum licensing system, which made it difficult for large carriers to assemble broad networks with sufficient capacity. Under the Clinton administration, the prospects of privatising the airwaves were not high. Now, however, the lobbyists in Washington are campaigning to transform this layer of the commons into private real estate. *In whose interests?*

The opening salvo was a joint letter by 37 eminent economists signed on February 7, 2002. They asked the FCC to allow broadcasters to lease spectrum that they currently held under licence from the government in secondary markets.

This was a step in the direction of achieving the aims that were spelt out by the Progress and Freedom Foundation, a conservative think-tank associated with Newt Gingrich, former Speaker of the House of Representatives. In *The Telecom Revolution: An American Opportunity*, the report called for the conversion of the spectrum to private property. Broadcasters holding existing licences would be granted title to the spectrum they currently used, and would be allowed to develop and trade it. The remaining unused parts of the spectrum should be sold to commercial enterprises and be reconstituted as private electronic real estate. The FCC would be abolished.

This prospectus was analysed by Jeremy Rifkin, President of the Foundation on Economic Trends, another Washington think-tank. He pointed out that property rights associated with spectrum are neglected.

> We regard it, more or less, like the oxygen we breathe, as a free good. In reality, the spectrum is treated as a "commons" and is controlled and administered by government who, in turn, licence the various radio frequencies to commercial and other institutions for broadcast. In other words, in every country the electromagnetic system is owned by the government on behalf of the people.[13]

But now the powerful media corporations want total control over the airwaves, and they are using economic arguments to justify privatisation. The analogy with the enclosure of common land in the late feudal era is striking. Rifkin wrote:

> If the radio frequencies of the planet were owned and controlled by global media corporations, how would the billions who live on earth guarantee their most basic right to communicate with one another? In an era where more and more of our daily communications take place in cyberspace, access to the airwaves becomes critical. Of course, those who can pay will be connected. But what about the 62% of people who have never made a telephone call, and the 40% who have no electricity? How will they ever secure access to cyberspace in a world where the admission fee is controlled by a few global media giants?

Similar questions might usefully be asked about privatised land and all the other resources of nature on which we depend. The answers would be more or less the same. By privatising nature, we convert the tenant status of a few privileged people and corporations, who become freeholders. The vast majority of people remain as tenants, but now their landlords are a few individuals or legal entities rather than democratically accountable government. But how would the benefits of the market economy be factored into such an arrangement?

The conundrum of how to share finite natural resources within the institutional context of private markets had preoccupied William Vickrey throughout his life. He had no doubt that *the market solution* was to require users to pay competitive rents for the benefits that they received when they occupied or used natural resources. Those rents would then be deployed to finance the services that we shared in common.

Rent as public revenue

WILLIAM VICKREY was emphatic that the optimum revenue for funding capital investments in public infrastructure was the rental income that could be imputed to land and natural resources. Economists who were to specialise in the theory of spectrum auctions were similarly aware of the wider fiscal implications. One of the leading American specialists is Paul Milgrom of Stanford University. Writing with Lawrence Ausubel of the University of Maryland, he acknowledged the Vickrey antecedents. He also alluded to the complex philosophical underpinnings that transform the auction mechanism into something more than a technical procedure for identifying current market values.

> In auctions of public assets, higher revenues also improve efficiency, since auction revenues can *displace distortionary tax revenues*.[14] (Emphasis added)

This single throwaway sentence is pregnant with significance for public policy. Taxes on people's wages and their savings cause a set of responses that end up as an artificial ceiling on the productivity of the capitalist economy. Removing them would raise the level of output and generate dynamic benefits that would enrich the fabric of society. But this economic insight has not been treated as practical politics by policy-makers and their advisers. They have allowed themselves to be intimidated with arguments against its adoption. Those same arguments were deployed against the 3G auctions.

One objection was that firms' costs would be passed on to consumers in higher prices. This challenge was met by Binmore and Klemperer. They report that telecom companies will charge the prices that maximise their revenue irrespective of what they had paid to acquire the spectrum. Their analysis is worth quoting in full.

> One way to explain how sunk costs work to non-economists is to imagine we are now in 2010 and the new cellular telephone services are being sold at whatever prices it turns out maximise their profits. If the government were suddenly to refund the licence fee (with interest, so that it was as though the licences had initially been given away), how would these prices change? Other things being equal, the prices would remain exactly the same, because a company would be irrational to lower its price below what the market will bear; the only result of the refund would be to increase the profit of the shareholders of the operating companies.
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> To take a more familiar example, consider housing prices. The price of new housing is no lower when the developer has the good fortune to obtain the land below its current market value (e.g. because it was obtained free through inheritance or was bought before planning permission was available) than when the developer has paid the full market value. In either case, the price is determined by the housing market at the time the new housing is sold. There is no more sense in handing out free spectrum to the telecom companies than in failing to charge developers for land in the belief that this will lead to cheaper houses.
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> Of course, telecom companies (and land developers) have enormous incentives to argue the opposite, because they obtain large windfall profits if they can obtain a scarce resource for free.[15]

Those windfall profits would be pure economic rent.

The making of a crusader

FOR the significance of rent in public finance to be recognised, we need the engagement of keen minds that bring to bear the sympathies of humanity.

Economics as a social science has been diversified by pretentious schools of thought whose doctrines emphasised scientific rigour at the expense of the values of society. William Vickrey was dedicated to the pursuit of rigour, but he insisted on acknowledging that practitioners should fulfil their social obligations. His death just at the point when he could have been re-launched as a moral influence over governments deprived public administration of one of the most perceptive observers of modern life.

An engineer by training who applied mathematical rigour to the clarification of economic problems, Vickrey deployed an empathy with the human condition that originated in his childhood. His life-long colleague, Dr. C. Lowell Harriss, who contributed the obituary to *The Economic Journal*, noted the influence played by Vickrey's exposure to the human suffering which he observed as a boy living in Switzerland just after World War I.

> The prolonged family contact with human misery must have influenced his lifetime sensitivity to the existence of suffering – and to the conviction that

> something could, and should, be done to alleviate and to forestall avoidable human distress.[16]

During World War II he worked for the US government, where he obtained an insider's view of policy-making. As a Quaker, he avoided military duty. He spent time chopping wood at the Mt. Weather forest reclamation project for conscientious objectors. In 1946 he was recruited to Columbia University to teach economics to GIs. Thus began half a century of teaching in New York. Taxation was the theme of his doctoral dissertation. He was a member of the Shoup tax mission to Japan (1949-50). From his practical experience in the real world, he began to write the many learned papers which spanned a range of topics that could not be matched by most of his peers.

His pre-occupation with esoteric topics like auctions and sealed bids was considered to be eccentric by some of his colleagues who were achieving media stardom. They wrote in the weekly press on topics designed to appeal to vote-seeking politicians who needed painless pump-priming measures to manage the economy. Policy-makers tend to prefer conventional wisdom, which does not disturb the electorate, and especially on sensitive issues like taxation. Undaunted, Vickrey pursued an independent path. Some of his papers were assembled in *Public Economics: Selected Papers by William Vickrey*. In this, one of the contributors noted that "the quest for efficiency of public service made him a crusader" who deplored "the slow acceptance of new ideas by regulatory or operating agencies".

Municipal policies and urban renewal were of particular concern. He saw that a range of seemingly dissimilar issues were linked by a correct understanding of the theory of rent. He had the proofs that would rebut the traditional objections of landowners. They objected to the notion of financing the capital costs of public services out of the rent of their sites. Vickrey demonstrated time and again that their properties would *rise in rental value* if they deployed their land rents to pay for roads, and for utilities such as water and railways. In his Presidential Address to the American Economic Association, he noted with regret the jurisdictional limits on reform in the USA, where the property tax is administered by local governments. Nonetheless, the prospective benefits from fiscal reform were of major proportions. The key to urban renewal, he argued, was to relieve buildings of the tax burden, and draw public revenue from the rent of land.

> Such a shift in the basis for local taxation might not only encourage private investment in improvements, but open the door to additional public investment that could then be financed without significant excess burden, *in many cases enhancing the rental value of the taxed land.* In particular, it would be desirable

> to increase land taxes to provide subsidies to enable local utility, transit, and other services to be priced efficiently at levels closer to short-run marginal social cost. To the extent that labor and capital finance are mobile, so that their returns are determined by a wider market, the gains in efficiency would be captured by land, as the immobile factor, so that *land rents would rise by more than the tax increase*.[17] (Emphasis added)

The algebraic proofs can be found in the specialist literature.[18] Below, I summarise Vickrey's conclusions from some of his public speeches.[19]

Miracle of the land market

IN AN open economy, in which people are free to move themselves and/or their savings, the returns to labour and capital are equalised throughout the economy. This is the starting point: we cannot study the workings of the land market in isolation from what happens to labour and capital. All three are integrated into a single system through the markets. Vickrey noted that, if we were to weld the private markets with the correct system of government taxation, a surprising result emerges:

> Given the high mobility of capital and labour, which tends in the long run to equalize returns to these factors over the region, landlords ultimately reap most if not all of the benefit from an increase in the efficiency of the city, and should, if they fully realised their long-term advantage, enthusiastically support the change to land-value taxation.

Here we have the miracle of the land market. As science and technology forge ahead to improve the economy's productive capacity, so the net gains – after defraying the costs of labour and capital – are expressed in the form of increasing rents. *The net benefits of investment are externalised.* These net benefits are measured by the rents that people offer for the right to occupy locations, for given periods of time; or to use or consume natural resources such as petroleum, zinc or water.

Transportation was one of Vickrey's intellectual passions. He spent a great deal of his time observing how people used public services such as the highways. He enjoyed writing algebraic proofs on the blackboard for his students, to demonstrate the efficiencies that arose if the rents generated by mass transit systems were treated as public revenue. Congestion was one of the problems that needed to be addressed. This problem emerged because public authorities failed to reflect the full costs in their charges. Vickrey based his theory on his field work observations. These ranged from the Woolwich ferry across the Thames which people used instead of going the long way round and under the Blackwall tunnel, to the Manhattan gridlocks. What ought to be done? If congestion charges were imposed

> Speeds would be substantially increased over nearly all the day, air pollution

> would be decreased, and the locality would obtain a substantial amount of revenue. Businesses, especially the high-level ones, would be attracted by the improvement in the ability to circulate rapidly, property values would increase, and the yield of the land tax at given rates would increase.

Vickrey shrewdly spotted the parallel between the failure to charge for land-based public services, and Soviet planning. Noting the wisdom of restructuring taxation, he recorded that

> Automobile traffic involves the use of scarce land for the occupancy of which land rents should be collected and used to finance government. Present practices with respect to urban traffic are analogous to Soviet practices in which commodities are under-priced and shelves are empty and there is much wasteful queuing to be on hand when supplies arrive, which is much like driving around looking for a space about to be vacated.

Vickrey examined all the methods for charging for the use of public space, and he was confident that if parking charges were "properly calibrated, this would automatically keep the charges at close to the market-clearing level, enhance efficiency, *and raise land values*" (emphasis added). But the beauty of this policy was that it would enable government to raise the general efficiency of the economy. How?

> Land taxes, congestion charges, and parking charges designed to promote the efficient use of the city's space should in most cases be capable of producing sufficient revenue to permit *the elimination of most levies that impair its economic efficiency, such as occupancy taxes.* (Emphasis added)

These new sources of revenue would be sufficient to cover the cost of providing public services, so that people who used those facilities – such as passengers on trains – need only pay the small cost involved in providing the extra seats required to carry them. This is what economists call the "marginal social cost of each type of trip". Vickrey concluded that public revenue out of rental income was crucial for supplementing the fares paid by passengers on trains, and "in the long run will result in the *enhancement of pre-tax land rents by more than the required subsidy*". (Emphasis added) In other words, as Vickrey stressed, it was in the landowners' interests to defray the capital costs of public services.

> Equity and efficiency are both served by having landlords contribute to the network costs of the services so as to enable their prices to be brought closer to marginal cost. In the long run the increased efficiency of the local economy would tend to redound to the benefit of the landlords *by raising their market rents by more than the amount of the subsidy.* (Emphasis added)

This is the alchemy of enlightened fiscal policy! And yet, for the last

two centuries, landlords have short-sightedly conspired with governments to defeat the policy that would make them even richer!

> If landlords in a community could be made aware of their long-run interests, they would voluntarily agree to tax themselves on a site-value basis to subsidize utility rates so as to permit them to be set at close to the efficient level, and find that the rental value of their land had risen by *more than the amount of the tax subsidy*. (Italics added)

Vickrey stressed that treating rent as public revenue was essential, to enable working people to share in the alchemy of the land market. Without that equal participation in the externalised rents, competition in the economy would exclude them from a share of the benefits of increases in efficiency. For otherwise, as he noted, "landowners, as the owners of the principle non-movable asset ... reap any gain from the improvement in the operation of the city or locality engendered by bringing utility prices closer to the efficient marginal cost level".

Among the few academics who actively shared Vickrey's commitment to fiscal reform was his colleague Lowell Harriss, who wrote in his friend's obituary:

> He showed, among other things, that a tax on land could facilitate desireable urban policies, i.e., taxes on an economic surplus, land rent, could help to pay for the fixed costs of public works, such as transit facilities, and thus commit marginal-cost pricing.[20]

Vickrey did not shy away from committing himself to an ethical position:

> Use of land rents, or, at least, of a major fraction of them, for public purposes is therefore not merely an ethical imperative, derived from categorization of these rents as an unearned income derived from private appropriation of publicly created values, but is, even more importantly, a fundamental requirement for economic efficiency.[21]

Vickery saw that everybody gains, and most certainly the landlords. In New York City, for example, both the commuters and the owners of land would be better off from a change in the philosophy of public finance.

> If the landlords of New York City knew what was good for them, they would vote enthusiastically for an added tax on site values to be devoted to lowering subway fares, especially for off-peak and shorter trips, and improving the frequency and quality of the service. Assuming that the subsidy would be used efficiently and not frittered away on administrative overheads, aborted, or put to grandiose construction projects or over generous fringe benefits, this would increase the value New Yorkers get for their outlays on subway service, increasing the attractiveness of the city, and in the long run *raising site rents by more than the tax*. (Emphasis added)

This insight is the financial starting point for a new departure in the delivery of urban transport services. The London Underground in 2003 constitutes such a case. The responsibility for it was legally transferred to Mayor Ken Livingstone in February 2003. In his negotiations with the government, the mayor had identified finance as one of the problems that would constrain the upgrade in the Tube's service to Londoners. The Mayor's transport commissioner, Bob Kiley – who was charged with overcoming decades of neglect in the investment in the Tube – was unfairly disadvantaged. He would not be able to deliver the best results that were technically possible. Why? Because the Tube is not financed on the basis of the best-practice principles identified by the Nobel laureate.

Sustainable economic growth

I HAVE stressed, *inter alia*, that location rents would rise as government shifted its fiscal base onto the rent of land. Would that disadvantage tenants and wage-earners? Vickrey and his colleagues insist that rental revenue would enable government to abolish taxes that cripple the economy. The net incomes of employees would consequently rise. The following discussion, although no more than a brief survey, should indicate the scale of improvements in society that would be possible, if we generalised the outcomes from the leasing of natural resources such as the radio spectrum. To focus the issues, we convert the Vickrey analysis into three hypotheses:

(1)The net benefits of scientific and/or technological innovations are externalised in, measured by, and captured through the land market.

(2)Benefits are maximised by a partnership between the market economy and public agencies that facilitate the lowest prices for users.

The bridge between private markets and the public domain is rent. That stream of income cannot be *internalised* into the revenues of individual enterprises by marginal cost/pricing mechanisms. Therefore, the partnership of a public agency is needed. Its role is to ensure the distribution of that externalised value in such a way as to reflect efficiencies delivered by the market principle that *people pay for the benefits they receive.*

(3)A breach in the principle of requiring payments for benefits received compromises the market's tendency towards efficiency.

The internet illustrates the issues. It originated within a fiscal framework in which policy was deficient. The breakthrough in electronic science had the effect of creating a rental value for the electromagnetic

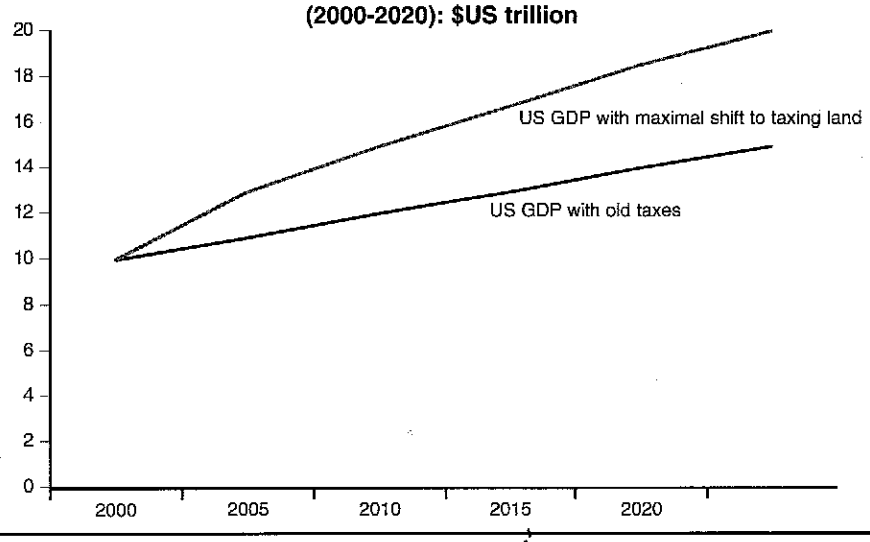
spectrum that previously did not exist. Legally, that natural resource was not private property. Governments ought to have put in place the institutional and legal mechanisms that demarcated and safeguarded both private and *social* interests. They failed to do so. That is why Bill Gates became a zillionaire: by default. The US government failed to internalise the rental values that were released by the electronic age, so Bill Gates obligingly performed that exercise. There was no legal reason why Microsoft should not capture the monopoly rents for the benefits of its shareholders. The alternative was to bequeath the rents to the consumers of software, by charging them less than they were willing to pay. Either way, the distributional benefits would not be equalised across the whole of the population.

William Vickrey's work provided the framework for understanding how we may *internalise* the benefits and costs of innovation and investment in the complex urban setting. In the process, the competitive status of private markets is enhanced. The financial equation is a clear one: the socialisation of community-created rental values is complemented by the privatisation of earned wages and savings. This provides the principled formula for tax reform. The outcome is the removal of the ceiling that is artificially imposed on the capitalist economy by taxes that inflict deadweight losses.

How much additional revenue would flow from this reform remains controversial. In the United States, Harvard economist Martin Feldstein has estimated that every extra $1 of income tax raised for the public purse costs the economy an additional $2 in deadweight losses.[22] Binmore and Klemperer suggest that the true cost may be more like 33 cents. Their downward revision of Feldstein's estimate may be in the wrong direction. The clue lies with the logic of reasoning. The point of departure for the analysis of deadweight losses is the optimum source of revenue – resource rents. Binmore and Klemperer acknowledge that "charging companies for spectrum incurs none of these additional costs".[23]

The losses to US citizens have been estimated by Professors Nicolaus Tideman and Florenz Plassmann. They estimated the uplift in GDP that would flow from the simultaneous substitution of resource rents for burdensome taxes. The detailed calculations were published in the *National Tax Journal*,[24] and updated for *Geo*philos.[25] Figure 2 summarises their findings. The reform would deliver sustained growth at a higher level than would otherwise be possible, adding an initial $2 trillion dollars to the wealth of the nation. Over the course of two decades, the gap between trends widens to $5 trillion. How to achieve that step-change in output is a practical problem that needs to exercise policy-makers. I argue that the G3 auction points in the direction of the transitional process.

Figure 2
USA: alternative growth strategies
(2000-2020): $US trillion



The counter-cyclical strategy

SUB-OPTIMUM incomes under-pin the tensions in capitalist society. In the economy, they surface as mass unemployment, which William Vickrey regarded as avoidable. The problem lay with deficiencies in the application of public policy. Lowell Harriss was able to track the unfolding of this aspect of Vickrey's mind and emotions.

> He became increasingly distressed at the extent of unemployment. He spoke and wrote with passion about the waste of life in undesired idleness. There is not only the loss of money income but also the tragic loss of spirit, of the opportunity to develop as human beings. The profession devotes too much time and attention to esoteric topics and things of little or no real importance for human well-being.[26]

Vickrey challenged economists to identify solutions to problems that appeared to be endemic in the market economy. He believed that relatively modest fiscal refinements would transform the welfare of millions of people. The problems of deflation in Japan would have attracted his attention: there was no reason why that dynamic country should have been locked in recession for over 10 years.

Japan's deflationary decade was the outcome of the failure to intervene with the counter-speculation strategies that would adjust values in the land market to realistic levels. During the bubble years of 1988/89, speculation drove price/earnings ratios to unrealistic levels. Speculators bought shares in corporations that were rich in land holdings.[27] The crash required policies that were *the reverse* of what governments employed.

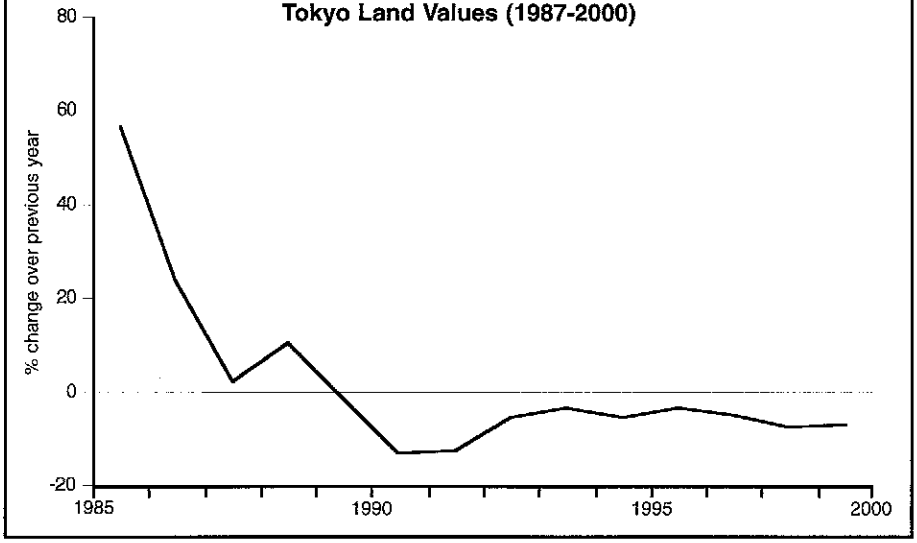
The route to full employment had received Vickrey's close attention. He warned of the danger from savings that exceeded the desired investment in infrastructure.

> Monetary policy could not push interest rates low enough to achieve the full use of savings in new building and other forms of capital facilities. The result – failure to achieve our potential, stagnation, unemployment![28]

His insights expose the futility of the monetary policy favoured by Tokyo. Despite the zero cost of borrowing money, people were not tempted to reduce their savings in favour of restoring consumption to levels that would encourage entrepreneurs to invest in capital formation. Figure 3 traces the trend of continuous decline in the underlying conditions of the all-conquering economy. The tale is revealed by the price of land. The economy was a victim of its own success. The measure of that success was the boom in land prices, which in the Tokyo metropolitan area in 1987 increased by 57% over the previous year, and a 24% increase in 1988. These were enormous increases in asset prices, which reflected the astonishing productivity of Japanese workers and entrepreneurs, as well as the psychology of speculation.

The Japanese had long forgotten the secret of how to harness the rents of land for the benefit of their society.[29] When the crash came, it did so in stupendous style. From 1991, prices went into the negative range, dropping by 12% in 1992 and in 1993 over the previous years.

Figure 3
Tokyo Land Values (1987-2000)



Politicians failed to address the problems in the banking sector, which was saddled with enormous bad loans (land was the favoured form of collateral). Desperately, the politicians sought to keep the economy alive without acknowledging that they needed a policy that dealt with land prices. Government *ought* to have introduced annual charges on land rents: these would have shaken out the false values, destroyed the unrealistic expectations of financiers, and restored the economy to a growth path. But instead of adopting a fiscal strategy that would restore confidence in consumers, the Tokyo government introduced a sales tax that penalised consumption!

Successive governments deployed Keynesian pump-priming strategies: in fact, a dozen of them – packages totalling more than 111 trillion yen (£653bn), trying to lift the economy off the floor. This cushioned the land market, and expanded the nation's debt to 128% of national output by the end of 2001. By the beginning of 2000, industrial production was back on a downward slide. The government clung to monetary policy, further cutting the key interest rate set by the Bank of Japan. This was reduced to an astonishing rate of 0.15%. It cost *nothing* to borrow money, but people had lost faith. Japan was now held up to public ridicule, branded the "sick man" of Asia. But its sheer weight was enough to threaten the global economy in the new millennium. On March 8, 2001, finance minister Kiichi Miyazawa announced that Japan's finances were "in a condition that is quite close to collapse".

Japan would have avoided deflation if its policy-makers had studied Vickrey's challenging account of "Today's Task for Economists". He distilled a lifetime's wisdom in the speech, focusing on the conditions that created full employment. The neo-classical wisdom preached that "there is no free lunch". Wrong, argued Vickrey.

> There is too a free lunch out there, in the form of under-utilized resources of labour and capital. The various forms of belt tightening urged on us in the name of fiscal rectitude, mostly by those who are in little danger themselves of sharing in the hardship, are not only cruel but unnecessary.

By establishing an efficient pricing system – one that delivered equal access to public services financed out of rents – the free lunch could be enjoyed by *everyone.*

> [E]conomists should see to it that market prices correctly reflect the relevant marginal social cost of various alternatives. I have devoted a major part of my career to the promotion of such marginal-cost pricing, but thus far with a notable lack of practical success outside academia.[30]

Following the British success with the G3 auction, might people outside academia now listen to William Vickrey?

The Tax Conversion Fund

TRANSITIONAL arrangements are needed to restructure the fiscal base. These need to be sympathetically calibrated with the state of society, to avoid catastrophic ruptures of the kind that have cyclically undermined the industrial economy.

New institutional devices are needed to assist public treasuries with the process of reform. These need to be intelligible to the public, which means the dense concepts of high finance need to be avoided. I propose that we conceive of the formation of a Tax Conversion Fund. The philosophy of this conversion process is underpinned by the need to

(a) **retire bad taxes**. In the course of identifying and adopting public charges that positively reinforce the goals of individuals and their communities, we can reduce or abolish those taxes that obstruct the freedom of people to work and save. And the need to

(b) **audit the fiscal adjustment**. At present, exchequers fail to provide the public with an audited account of the deadweight losses that are delivered by existing revenue-raising instruments. The Tax Conversion Fund would be charged with auditing the excess burden of taxes, which would reinforce the democratic right of people to express their preferences on the speed and direction of reform. In Britain, for example, was the net gain maximised when HM Treasury used the G3 windfall to pay down the National Debt, rather than to diminish (say) the rate of income tax?

This project offers a historic opportunity to democratise the way people raise their public revenue. Conventional approaches were designed in the pre-democratic age. They were designed to consolidate the privileges of the landed class.[31] The opportunity for this reform is delivered by the need to value and market new – or new uses for established – natural resources, such as the electromagnetic spectrum.

Devices such as auctions enable communities to establish the market values of the natural resources that are located in complex social and ecological niches. By establishing a transparent process, the engagement of everyone is assured. People would recognise their equal and direct benefit arising from the conversion of the *structure* of public revenue.

The principles on which the Tax Conversion Fund ought to be based, such as the need for audited oversight, non-bureaucratic determination of prices, free public access to all information, and the equal distribution of benefits, may be taken as non-negotiable.

As communities phase in new public charges on common natural resources, they can control the phasing out of the taxes that damage their economic incentives and the fabric of their communities. There would be

no increase in the levels of tax-take. Examples of the new sources of revenue that would be processed by the Tax Conversion Fund are discussed here.

Highway congestion

WILLIAM VICKREY'S preoccupation with highway congestion was no doubt due in part to the time he spent in Manhattan traffic jams. He modelled congestion as a queue behind a bottleneck, an approach that has since received strong empirical support from traffic flow studies. The article on that topic appeared 30 years ago but "was not recognised until long after publication ... one of the frustrating features of Vickrey's work is that so many gems of insight are presented in such a casual and offhand manner ... for this reason his papers bear re-reading and re-reading".[32]

Congestion appears to be insoluble in terms of conventional approaches to the use of finite space. Solutions to the chaos on Britain's roads and railway systems continue to elude the British government. Its 10-year integrated transport plan (announced in 2000) was rendered obsolete within two years.

A major part of the problem resides with the methodology of transport planning. Since the 1960s, planners have relied heavily on engineering paradigms. More recently, they have focused on the statistical exercise of counting trips. The bias in the methodology resulted in the demand for the construction of more highways. Congestion was perceived as justifying the need for more roads to relieve the bottlenecks. Vickrey challenged this approach, which failed to optimise the use of resources. Users were not charged for the benefits that they received (or the costs that they inflicted on others). These varied: travelling at peak times on a scarce time-and-space slot on the highway inflicted higher costs than comparable trips undertaken in off-peak times. The outcome was a sub-optimum use of infrastructure. The solution was to ration the scarcest amenities by charging variable tolls. This would spread the users across the highway system, relieving congestion and diminishing the need to build more highways.

> In the short run, the commuters are just as well off paying the variable toll and having no queue as they were before with no toll but with an equivalent queue ... The revenue derived from the charges thus represents clear gain. We thus have an example of tax revenue that not only has no excess burden, it has no burden at all! ... Imposition of the optimal variable toll in each case eliminates queuing and results in toll revenues equal to the cost of the eliminated queuing.[33]

The British government's transport adviser, Prof. David Begg (chairman of the Commission for Integrated Transport) has identified this anomaly, and he is promoting public discussion on variable toll charges.[34]

Road rents that varied according to peak and off-peak periods would generate a higher level of efficiency in the use of the highway network, reduce the pressure for additional capital expenditure, and generate an additional flow of revenue. Similarly imaginative solutions are needed for congested railway networks. The use of auctions[35] may well help to speed up Britain's train services while generating rental income that could be ploughed back into the financing of railway infrastructure.

The wider social implications of highway rental charges may be studied empirically in London. Mayor Livingstone has launched an experiment in congestion charges that began in February 2003. One aim was to cut traffic by 10-15%, and to double that number for reductions in congestion. Whether the £5 daily charge will achieve this outcome remains to be seen. A second purpose of the congestion charge is to channel the revenue (predicted net operating profit: £121m) into improved public transport. Thus, enhanced public services would be delivered without the need for taxes that inflict deadweight losses on every taxpayer.

Car parking revenue

MANY municipal jurisdictions fail to offer motorists the opportunity to pay the full market price for the privilege of parking at the curbside. The result is cruising for scarce parking slots, which causes congestion, pollution and the waste of fuel. In contrast, enabling motorists to pay the market price for parking their vehicle generates rental income for the municipality and, in the view of one University of California researcher (Donald Shoup), deliver improved transportation systems and a reduction in the off-street parking requirements that distort land use.[36] The borderland between the pavement and moving traffic lanes is exceedingly valuable – but that value generally goes unrecognised.

> Curb parking revenue is land rent, and off-street parking requirements act like a tax on improvements. Free curb parking and off-street parking requirements are therefore exactly the opposite of land value taxation: cities *fail to collect land rent, and they impose a heavy cost on improvements.*[37]

In Pasadena, CA., for example, one curb space yields $1,712 a year, charging at $4.70 per space per day. This compares with the $1,116 median property tax for owner-occupied housing units in the US in 1999. If the yield was $1,800 a year for a single curb space, with an interest rate of 5%, the selling price of that site would be $36,000 (say, £24,000), or $225/square foot. At that rate, a small 5,000-square foot residential lot that was worth $225 a square foot would sell for $1.1m![38]

Rental charges on curbsides clearly warrant closer scrutiny. As Shoup acknowledges, enhanced rents from this untapped source would enable communities to invest in their services and infrastructure. This is a

justification for the heavy parking fees imposed by the City of Westminster, in London, where on-street tariffs range from £1 to £4 per hour. The annual value of those sites is enormous. *The Sunday Times* (December 12, 1999) was staggered by the sale of a parking spot in a block near Harrods, in Knightsbridge – for £35,000. But consider the value of a space where the charge is £3 an hour. At eight hours a day, six days per week, 52 weeks of the year, the revenue is £7,488. At 5% interest, that yields a capital value of £149,760! Westminster Council is aggressive in tapping this source of revenue. Its 41,000 on-street parking spaces is expected to generate £93.8m in 2002/3, with projected net income of £35.6m., which will be ploughed back in road improvements, transportation for school children and for disabled residents.

Few municipal authorities seek to optimise their curbside rents in the way that the City of Westminster does. But citizens would probably welcome the tapping of this revenue, if the income was reserved for the provision of local services, and if this meant a reduction in the property tax on buildings (which inflicts deadweight losses).

Airport landing slots

VICKREY strongly commended the virtues of extracting rental income from the use of the space above our heads.

> Airspace is a resource in fixed supply comparable to land and in principle commanding a socially generated scarcity rent. Airport landing fees should also reflect marginal social cost. Auctioning of landing and take-off slots differentiated by time of day and week is one possibility.

The efficient rationing of take-off and landing-slots would spread the arrival and departure of aircraft throughout the day, and thus maximise the use of existing resources. In Britain, this would diminish the pressure to build a third runway at Heathrow, and additional airport(s) in "congested" south-east England. Is the south-east congested? How do we know? If airlines and their passengers paid the full rental cost of the resources that they used, they might disperse themselves across the national airport network. This response would reduce the need to invest capital in additional infrastructure. As Vickrey affirmed:

> Landing fees reflecting congestion costs at various times could bring about a coordination of use that might well defer for a considerable time the need for resort to costly additional construction, often at less convenient locations ... A rush to construct additional airports to take care of threatened congestion may prove particularly costly at the present juncture in that improved navigational and flight control methods seem to be on the verge of substantially increasing the capacity of present airports.[39]

Vickrey's strictures were not based on "blue skies" ruminations. The

regulation of the allocation of scarce landing and take-off slots at four US airports (La Guardia, Washington National, Kennedy International and O'Hare International) originated in 1968 when the FAA adopted a high density rule. More imaginative methods could be applied for rationing this scarce resource, however, employing the auction mechanism that would reward the public custodians of a finite resource.[40]

If government fails to capture airport rents the outcome is not lower prices for passengers; the rents are captured by airlines whose share prices reflect the under-pricing of the resource that they use. In Britain, airlines have developed a grey market in which they trade landing slots between themselves for millions of pounds a time, even though they are not the proprietors of the resource.

Institutional reform

RENT REVENUE from radio spectrum and air travel, and from earth-bound sources like highways and railways, would enable governments to diminish or abolish taxes that handicap the economy. Simultaneously, the new fiscal strategy would introduce order in the use of public services. These financial and spatial objectives may be approached from a variety of institutional routes.

The classical mechanism is the state's Inland Revenue (the IRS in the USA). This route places faith in the willingness of successive governments to progressively displace bad taxes with good charges on natural resources. The end result would be an exchequer with a restructured revenue base. But additional revenue-collecting institutions may be developed. This has the effect of dispersing the power that currently resides in the tax state and its bureaucracy.

The variability in the character and location of natural resources, and the communities that use them, help to diversify the institutional arrangements.

Petroleum, for example, is a homogenous resource, with prices set globally. Alaska has demonstrated how to develop distinctive arrangements that deliver equal cash rewards for all citizens in the state. The guiding dynamic of this model: the synchronisation of private markets with intergenerational welfare. After corporations take their profit, the oil-rent dividend is sliced up into the financing of public investments and an annual payment that now stands at around $2,000 per person. Alanna Hartzok has examined the profound implications for the character of governance.[41]

But some resource rents transcend specific jurisdictional boundaries, and therefore require cross-border institutional arrangements. The waste absorbing capacity of the ever-restless heavens present a challenge that has not proved to be beyond the ingenuity of market-based solutions. The concept of the public trust has been invoked as an effective non-

bureaucratic mechanism for allocating pollution rights, establishing market rental values, and distributing the benefits equally among citizens.[42]

The flow of revenue through the Tax Conversion Fund is not limited by the rental value of sovereign territories. What do we do about the mineral deposits that will one day be accessed via the oceans? The UN has adopted a convention that reserves those rents for the good of humanity. Markets will have to be used to determine the rental value of the treasure trove beneath the ocean beds. The international community might deploy part of this emerging rental stream to the conversion of tax systems that retard economic development in the Third World. An accelerated rate of growth in these societies would relieve the fiscal burden on aid-giving donor countries; transform international relations, as free trade became an association of equals; and diminish the grievances that currently nurture the discontent that spawns terrorism.

The making of new social systems

BY interrogating the interface between theory and policy, and the interaction between public institutions and private markets, we glimpse what is possible if statesmen designate the new resource rents of the 21st century as the income of humanity.

The fiscal route affords governments the opportunity to embark on substantive reform of their societies (this was the aspiration of Tony Blair's New Labour) by incremental stages. This avoids catastrophic strategies. Nations as culturally diverse as Germany and Japan are being told that they need to reform some of their primary institutions (e.g., labour markets). Others, especially the former Soviet bloc countries, are necessarily searching for new social structures. The fiscal strategy appears to imply the least disruption but, ultimately, an outcome built on principles of justice.

In the US, the debate about ownership rights over the natural resources that will be accessed in the 21st century (the sky's the limit) enables *We, the People* to refresh the revolution of the 1770s. The American Revolution – if periodically renewed – would move people's freedoms further in the direction favoured by the Founding Fathers: the liberty of, and equality between, individuals. The Vickrey fiscal paradigm would empower communities to discharge their public obligations in ways that have not been hitherto possible.

Most of the discomfort from this exercise would be felt by social scientists. They would be obliged to rework their models of the economy and society. At present, for example, economists approach problem-solving tasks within the tramlines of the neo-classical paradigm. This limits their usefulness. The fundamental shortcoming remains the inability to conceptualise problems in terms of three-dimensional reality. The

economy is represented as operating in a spatially disembodied virtuality, with labour and capital apparently rotating somewhere beyond Newtonian gravity.

It is true that, occasionally, economists tackle spatially located problems. But they are more attracted to the challenge of estimating the congestion costs of readers in the British Museum[43] than congestion in the skies above London's airports. A back-to-basics approach to economics appears warranted. The use to which notions like "optimal taxation" need to be questioned if the public is to be provided with audited assessments of policies made on their behalf. At present, the impact of tax policies is evaluated in partial terms. For example, one recent study of optimal taxation compared tax policies in an economic federation where public goods were financed via labour income taxation.[44] The study may have said something interesting about the relative performance between two levels of government, but the outcome could not be an account of "optimal taxation". Optimality is delivered when all levels of government avoid inflicting deadweight losses. Relative performance is measured when outcomes are tested against the benchmark fiscal policy: the payment of rent for the use of natural resources.

By re-conceptualising space, people will be able to reconfigure the cultural potential of society. A new creativity would unfold itself. Bio-regional administrative units, for example, are commended by ecologists. The new fiscal approach would enhance the chances of adopting such political innovations. To derive the full benefits of these fiscal reforms, however, we need to enshrine the economic visions of William Vickrey into practical institutional formations. And that requires a substantive debate about the nature of property rights (*see Box 1*).

References

1 The comparison is offered by Prof. Ken Binmore – citing Gibbon's *Rise and Fall of the Roman Empire* (1776) – who was the prime architect of the British auction formula. Ken Binmore and Paul Klemperer, "The biggest auction ever: the sale of the British 3G telecom licences", *Econ. J.* 112 (March 2002), p.C74.

2 Prof. Mason Gaffney of the University of California (Riverside) was a life-long friend and colleague of Bill Vickrey. In Gaffney's privately circulated Eulogy, he recalled telephoning Vickrey to congratulate him on the award. Gaffney recalls that final conversation in these terms: " A reporter asked Bill what he would do with his prize money. Bill said he didn't care about the money, and he spoke truly, for his conscience would not let him live it up while others were down. He said he valued the "bully pulpit" the prize gave him to spread his ideas. He didn't say which ideas; he had many. I am morally certain, however, that near the top of his list was implementing George's proposal to raise public revenues by taxing land values."

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Box 1
A New Declaration on Property Rights

THE US Constitution does not enshrine people's traditional right to a share in the benefits of the natural resources within their home territories. Those rights have not been defended by English common law. Capitalism, consequently, has been compromised. The mal-distribution of income is treated as a "market imperfection" rather than a defect of the land-and-tax nexus.

The solution is the consistent application of the principle of paying for the benefits one receives. This principle is applied in the labour and capital markets, but not with respect to nature's resources in the land market. Two recent cases involving the radio spectrum in the US exposed the deficiencies in people's constitutional rights. Through such gaps in rights, the door is opened to distortions *inflicted on* the market economy by the pursuit of favouritism in politics.

- NextWave Telecom Inc. acquired its licences for $4.7bn in 1966, but failed to make payments beyond an initial $474m. It filed for bankruptcy in December 1998, without having put the licences to use. The FCC retrieved and re-auctioned the licenses for $16bn. NextWave sued, claiming the licenses were assets of the bankrupted company.

The Supreme Court agreed to hear the case, and on January 27, 2003, it ruled that the FCC had unlawfully seized the licenses. NextWave is now free to use them, or to sell them for a huge profit.

- Northpoint owns the patents to a technical innovation that would double pay-TV services by intensifying the use of a sliver of the electromagnetic spectrum. The company sought licences without paying for them, claiming that they would increase competition among service providers and reduce costs to consumers.

Rivals countered by arguing that granting Northpoint free use of spectrum would repeat past errors when the government gave away spectrum worth $70bn, allegedly to foster the introduction of high-definition television. AT&T complained to the FCC that Northpoint's demands would lead to unjust enrichment.

The battle over the airwaves has now become politicised, and the public interest needs to be re-visited. So fundamental are the property rights issues at stake for the new electronic Information Age, that it would be appropriate if democratic societies once again re-visited the philosophy of property rights.

To remove ambiguities, and to restore people's equal rights of access to the benefits of nature, parliaments and congresses need to promulgate a Declaratory Act.* This should insist, in unequivocal terms, on the community's inalienable right to the market-based value of Rent for the public purse, current arrangements and laws notwithstanding. With this statement of rightness in place the government could then move on to the practicalities of Rent collection and the corresponding abolition of deadweight taxes that fail to serve economic, environmental or social objectives.

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