

TIME-INCONSISTENCY:

THE DISCUSSION IN LEVINE, STERN AND TRILLAS (2005) AND APPLICABILITY TO THE NEW ZEALAND UCLL & UBA PRICING REVIEW

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EXPERT PROFILE: I am an academic with research interests focusing on regulation, industrial organisation, political economy and institutional economics. Key relevant publications include:

- Levine, P.; Stern, J.; Trillas, F.: Utility Price Regulation and Time Inconsistency: Comparisons with Monetary Policy, *Oxford Economic Papers*, 57: 447-478, July 2005
- Evans, J.; Levine, P.; Trillas, F.: Lobbies, Delegation and the Underinvestment Problem in Regulation, *International Journal of Industrial Organization*, 26(1): 17-40, January 2008.
- Montoya, M.A.; Trillas, F.: The Degree of Commitment to Regulator Independence: Measurement and Impact, *Hacienda Pública Española. Revista de Economía Pública*, 185(2): 89-114, 2008.
- Gual, J.; Trillas, F.: Telecommunications Policies: Measurement and Determinants, *Review of Network Economics*, 5(2): 249-272, June 2006.

CONTEXT: I have been requested by Vodafone NZ and Spark to provide a short opinion that:

- explains the concept of time inconsistency; and
- assesses the relevance of the quote of my work that has been included by Sapere in a submission to the current regulatory process of the NZ copper review. The quote is from a paper I co-authored with my colleagues Paul Levine and Jon Stern: Levine, P., J. Stern and F. Trillas (2005), 'Utility price regulation and time inconsistency: comparisons and monetary policy', *Oxford Economic Papers* 57 (3), July 2005.

The views stated in this opinion are entirely my own.

MY CO-AUTHORS FOR THE 2005 OXFORD ECONOMIC JOURNAL PAPER:

Paul Levine is Professor of Economics at Surrey University, UK. He is co-author with Professor David Currie of a book, *Rules Reputation and Macroeconomic Policy Co-ordination (CUP)*. Other activities include: consultancy for Ofcom, visiting researcher at the IMF and the ECB, and visiting Professor at Autònoma University, Barcelona. His general research area is in open economy macroeconomics with a particular focus on policy rules, international policy coordination and the credibility problem.

Jon Stern is a Panel Member at the UK Competition and Markets Authority (CMA) and an Associate Researcher at EPRG, Cambridge. He is also Honorary Visiting Professor at the Centre for Competition and Regulatory Policy in the Department of Economics at City University, London and a Visiting Fellow at the Cambridge Judge Business School. Jon was previously a Senior Advisor at CEPA (Cambridge Economic Policy Associates) and an Associate Director of the Regulation Initiative at the London Business School. Jon's specialist areas include the economics of infrastructure industries, including energy, water and railways; the relationship between economic regulation and competition policy; and economic regulation and regulatory governance issues.

TIME INCONSISTENCY AS A CONCEPT

The following situation would be described as time inconsistent behaviour by a regulator: a regulatory decision is made that could not have been predicted, is the opposite of what had previously been decided (and communicated), and sunk investments had taken place based on the previous decision.

For example, a national government expropriating a foreign-owned electricity firm without sufficient compensation would be time-inconsistent. Or a regulator fixing motorway tolls lower than those that had been committed to at the time of contracting with third party construction/operators, would be time-inconsistent.

THE CONTEXT OF LEVINE ET AL (2005)

In Levine, Stern and Trillas (2005) my co-authors and I develop a model representing the relationship between an incumbent regulated monopoly and a price-setting regulator. The paper compares the time inconsistency problem in the regulation of network industries to the problem of time inconsistency in monetary policy, and suggests that, as in monetary policy, a possible solution to the problem is regulatory independence.

The paper does not deal with specific regulatory actions, decisions or strategies, and its analysis is applied to a very simple industry structure in which there is only one firm.

The main motivation for the research and resulting paper was to address the underinvestment problem in telecommunications and other network industries that many developing countries faced at the time.

The quote from our 2005 paper used by Sapere

Sapere's submission includes a quotation from our 2005 paper, which allegedly warns against time inconsistent behaviour. The original passage (on page 471) - which I note has been incorrectly replicated by Sapere - reads:

Of course, infrastructure regulators – in developing as well as developed countries – need to balance their role in supporting investment with their role of protecting consumers against monopolistic exploitation. Capture is a threat in all environments. However, in many countries, the risks to ensuring that the majority of citizens fail to have access to such services more often than not comes from overprotection of current consumers relative to future consumers and investors.

I have been advised by Vodafone and Spark that another independent expert advisor, Network Strategies, has commented that the wording in the final sentence of this quoted paragraph is confusing, as it may not reflect the full message that myself and my co-authors were attempting to convey. My own view is that Network Strategies are correct that this sentence could have been written more clearly, and are correct that my and my co-authors' primary concern was to contribute to the literature on regulatory frameworks with a view to ensuring that the majority of citizens in developing countries have *access to*, rather than *fail to have access to*, telecommunications services.

Monopoly market structure assumed by the paper with a pro-industry regulator

In the specific case of this paper, "industry" is synonymous with "firm", because the industry is assumed monopolistic and vertically integrated. Given the assumed vertical integration, there is clearly

no distinction made in the paper's model between upstream and downstream suppliers. The paper is not written with reference to an upstream monopoly with competitive retail service producers downstream.

The regulator in the paper is characterized as either a representative government that cares mainly about consumer surplus, or a relatively pro-industry regulator that places a positive weight on industry profits.

The investment situation addressed by the paper is that of a firm deciding to invest ex-ante, with regulatory decisions occurring afterwards.

The investment situation addressed in the paper is a two-stage game. In the first stage, the single regulated firm decides on a continuous amount of resources to be sunk as investment. Next, in a subsequent stage, the regulator decides on the price that applies to that firm's output. The investments are assumed to be sunk and cannot be redeployed. Thus if the firm has already invested, and if the regulator cares mainly about static consumer surplus, the regulator may fix a price that might not cover the investment cost, regardless of any promise made previously. As investments are sunk before the prices are decided, the firm may therefore be reluctant to invest if it anticipates that the regulator will not consider investment incentives and thus the price set will not be enough to cover investments.

Thus, in the paper, we have created a framework to compare the hold-up problem of sunk investments and associated risk of under-investment in our regulated industry, and consider the time-inconsistency problem that has been discussed in the context of monetary policy.

In monetary policy, a non-independent central banker has incentives to exploit, in the short run, the trade-off between inflation and unemployment. By delegating decision-making to a relatively anti-inflation central banker, the government commits not to increase inflation in an opportunistic way. Similarly, to avoid *de facto* expropriating sunk investments in regulated industries, the government can delegate decisions to relatively pro-industry regulators, either literally, or by introducing procedures that make sure that regulatory agencies hold as objectives the long term interests of consumers through a concern for investment.

Additionally, we argue in the paper that the problem of time inconsistency may be more acute in regulation of industries than for monetary policy, for example due to slow asset depreciation (this increases the length of the period in which the regulator may be tempted to expropriate the investor) or in situations where there is little demand growth.

We argue in the paper that there is an optimal level of weight that the regulator should assign to industry profits, but that this optimal weight may be difficult to achieve if the regulator is not independent. If this weight is too high, there may be profits in excess of what is necessary to compensate investors for the risk-adjusted cost of capital, and consumer surplus may be so low (because of high final prices) as to reduce total surplus. If the weight is too low, inter-temporal economic profits will be negative and the firm will be reluctant to invest in the first place.

In a context of uncertainty and changing industry conditions, an independent regulatory agency must be able to act with the discretion necessary to react to these changing conditions. Discretion is necessary to combine both speed in the face of changing industry parameters, and certainty. At the same time, discretion must be controlled and monitored.

CERTAINTY IS CRITICAL FOR OPTIMAL MARKET OUTCOMES

Certainty is critical for optimal market outcomes. Institutional designs that aim to achieve this include for example the British utility regulators who are required to behave with a specific objective function, and therefore constitute an applied example of what we call ‘as if’ Rogoff-delegation (as opposed to literal Rogoff delegation, where the government selects a central banker or regulator with specific preferences among a pool of potential regulators). This notion of delegation was introduced in monetary policy by the economist Kenneth Rogoff.

In practice, the need to constrain the discretion of regulators stems not only from the need to impose on them a duty to be focused on dynamic efficiency, but also from the need to enforce accountability and promote legitimacy and market credibility. We conjecture that these features could be captured in a model that expands our setting to take into account asymmetric information and non-benevolence. These features would probably make independent agencies more necessary, but the need to constrain their discretion more acute.

By improving commitment, independent regulators can guarantee efficient investment levels, which benefit current and future consumers. Our concern in the paper was ensuring that citizens in developing countries have access to modern high quality telecommunications services. For those developing regulatory regimes, time-inconsistency issues may be addressed through a rules-based approach to regulation, or by delegation to an independent, relatively conservative, agency that has its discretionary powers defined in primary legislation. In the paper we argued that the latter is preferable because of uncertainty and changing industry conditions.

Of course, we argue in the paper that there are significant differences between the tasks faced by independent central banks and independent regulatory agencies. The most important difference is that regulation (at least in some network industries such as telecommunications) is inherently about the monitoring and enforcement of the behavior of commercial (and potentially competing) companies according to license conditions or equivalent obligations, although we do not address this issue in any detail in the 2005 paper. Monetary policy is not primarily concerned with the regulation of banks, at least not before the 2008 financial crisis. In consequence, regulation must operate within a general competition framework and may in time be replaced - at least in some countries and for some industries - by general ex post competition policy.

The paper is related to an empirical literature that shows positive effects on investment of regulatory independence, as well as positive effects of central bank independence on inflation rates. This is not the same as evidence that relatively pro-industry regulators or relatively conservative central bankers have a positive impact (this is a common feature in both literatures), which suggests the need to study the duties and procedures of regulators and their relationship with protecting industry investors.

However, other work mentioned in our paper provides preliminary evidence that independent agencies in developing countries, are indeed relatively pro-industry.

We emphasise that delegation to a relatively pro-industry regulator should occur in a context of discipline and accountability. There are obvious disadvantages of regulatory capture when the idea of a pro-industry regulator is on the table, which may lead to allocative inefficiency and undermine the legitimacy and the sustainability of the regulatory package. That is why delegation to relatively pro-

industry regulators should be carefully laid out in regulatory laws and processes so that consumers perceive that regulatory institutions are designed in their long run interest.

The theoretical arguments and the emerging empirical literature on regulatory governance suggest strong potential benefits from well-founded regulatory arrangements with proper and transparent procedures that will support limited and accountable discretion.

APPLICABILITY OF THE OEJ PAPER'S SITUATION TO THE CURRENT NZ MARKET STRUCTURE

In our 2005 paper we analyse one firm, that has no horizontal competitors and without vertical relations. With downstream entry, entrants also invest and also make other decisions that are costly to change, such as entering a new market, developing a distribution chain or customer relations. However, the academic literature examining the political economy of regulation with more than one firm in an industry subject to regulation is not even in its infancy.

In theory, it could be that there is under or over-investment in the absence of an independent regulator, or when the regulator cannot commit. But one can presume that the final outcome of the game depends on the specifics of the industry structure and the strategic interaction between entrants, incumbents, governments and regulators.

The evolution of the related academic literature after that 2005 paper has focused on regulation in practice, the relationship between access prices and investment, commitment problems in both directions (also the firm failing to commit), the incentives to invest by multi-national firms, and other topics. However, as far as I am aware, there is no research considering time-inconsistency and independent regulators in an industry structure with downstream entry.

Thus, the current situation in NZ is different from the situation analysed in our 2005 paper: I understand upstream investments in fibre have been agreed via government policy and are not conditional on the outcome of the copper pricing review. In contrast, I understand the downstream competitive RSPs are making investments in services provided over copper.

Furthermore, I understand that in the context of the New Zealand UCLL and UBA pricing reviews neither backdating nor not backdating would be a surprise that makes previous statements time-inconsistent, as the potential for backdating has been on the table for some time. I understand from Vodafone and Spark that backdating of NZ copper access prices within the NZ context of IPP/FPP has been signalled as a possibility since late 2013, although there was nothing to create firm expectations that this would happen.

And so, according to the required conditions for time inconsistency, it is my opinion that whatever the Commission's decision on backdating, it will not be behaving in a time inconsistent manner.

RECOMMENDATION/OPINION

In a context of a partially competitive telecommunications industry - that I stress was not the situation we addressed explicitly in the paper - I conjecture that we would interpret the commitment problem in regulation as the need to establish a stable regulatory framework. A stable framework is one in which

both incumbents and entrants can plan ahead, and where uncertainties are reduced to technological and demand uncertainties, with regulatory or political uncertainties reduced to a minimum.

In the absence of an explicit regulatory commitment, I understand that the transparent procedures of the regulatory institutions in New Zealand are iso-morphic to what we call “as if Rogoff delegation” in our paper. The structure, practice and nature of the consultative process in regulation minimises any long run risk of under-investment due to time-inconsistent regulation.

Thanks to these transparent procedures, the final regulatory decisions will be made on a well-understood position as to the application of the legislation and best practice to relevant facts and circumstances, within a context of accountable discretion.

In this context, my opinion is that a decision to apply backdating pricing rules, that is made at the end of a regulatory process, would be difficult to justify unless there are very clear and exceptional circumstances that recommend them.