

Competition, policy stability and growth

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1. Choice of Policy Objective

The seminar theme is “Government Policy and Economic Growth”, and the sessions cover the inputs to a neoclassical growth model – human capital, physical capital and total factor productivity (with competition a theme under productivity). There is an implicit suggestion that more growth is a good thing, and more human capital, investment, and productivity (and competition) is the way to get it. I make two opening observations on this.

First, growth *per se* is not always a good thing. Individuals have preferences over the work-leisure trade-off; external environmental concerns should be factored in via constraints or prices that ensure that private transactions are welfare enhancing; and the contribution (and possible trade-offs between) growth and income distribution goals need to be considered. Given these provisos a policy environment that facilitates growth appears highly desirable.

Second, more human capital, investment and competition will not necessarily deliver higher growth (and may deliver less if promoted via poor public policy). I call this the “good thing” fallacy. When opportunity cost is taken into account, more of a good thing can mean less overall. In economic terms the marginal product isn’t just declining, but can be negative.

In this paper I first briefly consider competition, imperfect competition and monopoly. I then develop arguments in relation to the costs of policy uncertainty for investment and innovation, and suggest some high level means of addressing policy uncertainty.

2. Competition, Imperfect Competition & Policy Uncertainty

2.1 Competition

In a hierarchy I would tend to put free exchange high on the list of desirable policy goals – if someone values something (labour, goods or intellectual property) more than someone else then they should be free to “trade”. Further, competitive trade, where buyer and seller are price takers, is likely to be more efficient than bilateral trade, since bilateral trade is likely to involve missed opportunities for efficient trade.¹

Competition is superior to bilateral trade, and is a good thing because it achieves two goals simultaneously. First, it ensures that the benefits of competition are ultimately transferred to consumers. Second, it ensures that competitors benefit fully from cost reduction and innovation.² Provided competition is supported by a sound framework for the protection of intellectual property rights, competition also has the benefit that risk is factored in and rewarded – innovators who risk failure are rewarded by high *ex post* returns when successful (in centrally planned or regulated markets it is very difficult to factor in and reward risk appropriately). However, it does not follow that competition should necessarily be

promoted. Neither does it follow that competition can be mimicked via regulatory intervention in areas where there is little or no competition.

2.2 Imperfect Competition

Competition is often imperfect in the sense that firms are not strictly price takers. However, unchecked imperfect competition may nevertheless be superior to feasible regulatory interventions in many instances (given information constraints and the uncertainty that an overly “activist” competition policy may generate for businesses). Competition policy should aim to improve economic efficiency taking all the costs and benefits of alternatives, including non-intervention, into account. However, there are a number of difficulties that need to be considered in coming to such a judgement.

First, it is difficult to judge the competitiveness of a market by observing a snapshot of behaviour and outcomes. High *ex post* returns may reflect (subjective) *ex ante* risk taken by entrants, and real options effects (discussed later) imply that prices can be above long run marginal cost or below short run marginal cost for significant periods of time in an efficient competitive equilibrium (only long run observations would show whether average returns were normal).

Second, it has proved difficult to devise robust and efficient *per se* rules in relation to competition policy (generally applicable prohibitions on conduct). Arrangements such as vertical constraints, which were once thought to be harmful, are now seen as beneficial in a range of circumstances.³ Due process is therefore important to assure investors that reasoned decisions flowing from clear policy objectives and transparent and objective methods will be reached.

2.3 Monopoly

Network industries are characterised by increasing returns to scale and long-lived assets. The nature of network industries raises two related concerns – protection of consumers from monopoly abuse and protection of investors from opportunistic behaviour by governments and regulators (the risk that once investments are sunk, returns will only be allowed in respect of ongoing operating costs). In addition, political economy considerations suggest it is almost inevitable that such industries will be regulated in some form on an ongoing basis.

Regulation cannot mimic competition since the information structure of the problem is fundamentally different. In contrast to competitive markets, under regulation productive efficiency (a function of incentives) and allocative efficiency (cost reflective prices) are conflicting goals, and an efficient trade-off between the two must be reached.

* The views expressed in this paper are the author’s and do not necessarily reflect the views of NERA.

1 Myerson and Satterthwaite (1983). “Efficient Mechanisms for Bilateral Trading”. *Journal of Economic Theory* 28: 265-81.

2 Since they are price takers savings accrue fully to those who cut costs or innovate relative to a counterfactual where they do not. Some innovations involve knowledge spillovers that are shared with competitors, although various interventions designed to strike a balance between short and long term consumer benefits (lower prices now, or more innovation), for example, patents.

3 NERA. July 2000. “EC Vertical Restraints Guidelines: Effects-Based or Per Se Policy?” *Competition Brief* 13.

Good regulation must provide incentives for short and long-term efficiency. Allowing companies to retain a share of the gains from cost reduction can encourage short-term efficiency; while stability and commitment are essential to reduce the perceived risk of expropriation of investments, thereby encouraging efficient investment. However, regulation cannot hope to achieve the efficiency in terms of dynamic choice over investment and innovation that competitive markets produce. The best that can be done is to minimise such costs through sound regulation, and a clear focus of regulation on network monopoly elements of the business.

2.4 Policy Uncertainty

In order to support free exchange well-defined property rights are required. However, wealth, once created, is always a tempting target for governments wanting to meet distributional or other goals. Ensuring that powers of taxation are exercised according to well-defined rules and procedures can help allay such concerns, although tax codes can (and at times should) be amended. This simple example illustrates a broader set of policy issues related to the “power” of governments to breach prior commitments, and to introduce uncertainty into the market via policy uncertainty. The fact that governments have the “power” to renege on commitments reduces their ability to act in the public interest, and is a weakness that good governments try to overcome through checks and balances on administrative discretion.

The problem of constraining the discretion of government, to allow credible commitment, can be partially addressed via carefully designed institutional arrangements (which raise the cost of renegeing on agreed “rules”) and due process or procedures that can constrain discretion while accommodating the need for policy to evolve over time.

However, while macroeconomic stability has become an accepted tenet of economic policy, microeconomic policy stability has arguably received less attention. Three suggestions are made as to why this might be so:

- Opportunism and uncertainty may no longer be viewed as serious problems in developed economies that operate according to the rule of law.
- Complacency may owe something to capital theory that suggests that, with complete markets, uncertainty *per se* may be diversifiable and therefore may not be of concern.
- Microeconomic policy covers a diverse range of issues and it may be difficult to envisage how stability and predictability can be promoted without locking in a potentially inefficient status quo.

2.5 Opportunism

Investment in irreversible physical, human and intellectual capital is a key part of the growth process. However, such investments are open to expropriation. Once investment is made, the argument goes, it is efficient to treat it as sunk and consider only marginal costs or investments in policy formulation. Even where investors are allowed a return on their invested capital when governments intervene, the *ex ante* risk they took when investing is seldom compensated.

Investors and entrepreneurs will anticipate unchecked expropriation, and adjust their behaviour by reducing investment, investing in less specific or more mobile forms of capital, and investing in less risky ventures. The cost to growth may be substantial. In private markets contracts are used to reduce opportunism, however, it is difficult for governments to enter into binding contracts since they have the power to legislate. Ensuring that well-intentioned and rational individuals decide policy does not of itself overcome the problem.⁴

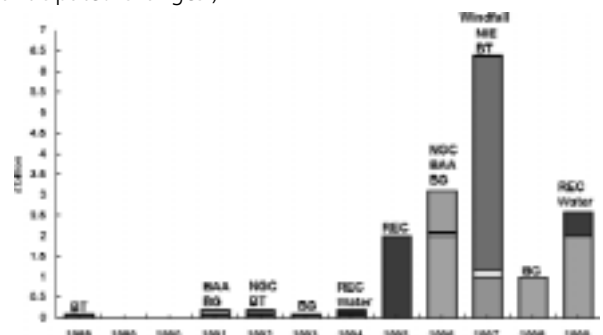
“Even if there is an agreed-upon, fixed social objective function and policymakers know the timing and magnitude of the effects of their actions, discretionary policy, namely, the selection of that decision which is best, given the current situation and a correct evaluation of the end-of-period position, does not result in the social objective function being maximised. The reason for this apparent paradox is that economic planning is not a game against nature but, rather, a game against rational economic agents.”

Microeconomic policy areas where opportunism is a problem include the taxation of capital (physical and human), competition policy and the regulation of monopoly infrastructure. For example, competition policy may require access to essential facilities at prices that do not cover the costs of prudently incurred sunk investments, or do not reward the *ex ante* risk an entrepreneur may have taken in making the investment. Entrepreneurs risk failure when they innovate and are compensated accordingly with above average returns when successful, and such *ex ante* risk is not necessarily reflected in measures of the cost of capital.⁵

A recent example of commercial failure is Iridium, the satellite based mobile phone system. Had Iridium been successful, competitors may have argued for, and obtained, access at prices that reflected a normal return on invested capital, ie no allowance for *ex ante* risk. Another illustration of the problem of opportunism is provided by the regulation of utilities in the UK over the past decade (see Box 1).

Box 1 Regulatory opportunism in the UK⁶

The following figure shows the impact on the present value of UK utilities from a series of “rule” changes. Initial reviews, up to the 1995 Regional Electricity Company (REC) price review, more or less validated the NPV of the price controls set at privatisation. The first significant rule change was in 1995 when the proposed price caps for regional electricity companies were revised following a take-over offer. A series of “rule” changes followed, including the windfall tax in 1997, which extracted £5.2 billion from the privatised utilities. The impact on the water industry is based on the 1999 draft determination. (Note that the values given are calculated changes in the NPV of the business, not observed changes in market value that reflect many factors including anticipated changes.)



4 Kydland, F and Prescott, E. 1977. “Rules rather than discretion: the inconsistency of optimal plans”. *Journal of Political Economy*. Vol 85, No3, p619-637.
5 For a related argument see A Lawrence Kolbe and William B Tye. 1995. “It ain’t in there: the cost of capital does not compensate for stranded-cost risk.” *Public Utilities Fortnightly*, May 15.
6 Graham Houston (NERA) “Regulatory Risk and the Cost of Capital” to Utility Regulation Summit ‘99. May 26 1999, London.

2.6 Pure Uncertainty

In addition to opportunism, pure uncertainty (or noise) can be expected to harm output and growth. While this may seem intuitive, anyone trained in capital finance theory might argue that pure uncertainty is diversifiable and therefore not costly. However, relatively recent developments in economics and finance suggest three reasons why pure uncertainty may be costly:

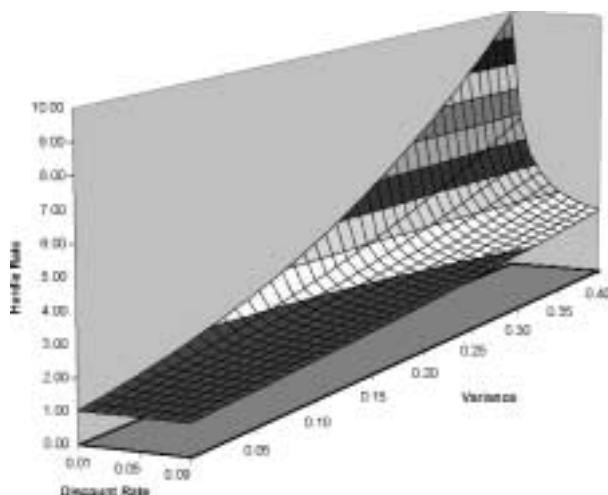
- Pure uncertainty may raise investment hurdle rates, and raise entry and exit thresholds in an industry.⁷
- Pure uncertainty makes it harder for principals to monitor agents (say owners and managers) since it is more difficult to identify and reward the difference between good management and good luck.⁸
- Pure uncertainty increases the risk that the free cash flow available to businesses will be inadequate to finance their strategic investments.⁹

2.6.1 Real Options

When investment entails sunk costs, there is uncertainty, and there is flexibility over the timing of investment, waiting has positive (option) value that should be balanced against the expected return. The value of waiting is analogous to a financial option value, and implies that uncertainty can raise required returns (investment hurdle rates). Note that the real option effect is unrelated to risk aversion, and applies whether the uncertainty in question is diversifiable or non-diversifiable.

Figure 1 illustrates the impact of real options on hurdle rates for various levels of uncertainty and discount rates. For a variance of returns of 30 per cent and a discount rate of 5 per cent the hurdle rate is increased 2½ fold ie a 5 per cent discount rate would translate into a 12.5 hurdle rate (assuming the investment is one off and the uncertainty follows a geometric Brownian motion).

Figure 1: Relationship between hurdle rate and uncertainty (variance of returns)



Real options may therefore help explain an apparent paradox in terms of corporate investment behaviour, namely the fact that firms often use hurdle rates substantially higher than the cost of capital in appraising investment decisions. Consideration of real options also suggests that unnecessary policy uncertainty may have a damaging effect investment. Recent empirical work has sought to test the hypothesis that uncertainty impacts on aggregate investment via real options effects and support has been found for the proposition in the US¹⁰ and the UK.¹¹

Real options also raise entry and exit price thresholds into markets with fixed entry and exit costs. The effect can be large, for example, in an analysis of the copper mining industry entry and exit thresholds of \$0.88 and \$0.79 cents per pound were calculated for standard (Marshallian) entry and exit triggers with operating costs of \$0.80 per pound due to fixed costs. However, the entry and exit thresholds widened to \$1.35 and \$0.55 cents per pound when real options effects were considered, and the copper price would be above the threshold for supernormal profits or below the point at which operating losses are made 90 per cent of the time.¹²

The impact of uncertainty via real option values on entry and exit thresholds may be particularly important when considered alongside the importance of entry and exit to innovation and productivity growth. Based on a panel data analysis of UK manufacturing a study published in April 2000 found:

*"Between 1980 and 1992, single establishment firms (25% of manufacturing employment) experienced no productivity growth among survivors; all productivity gains for this group came from entry and exit. Most of TFP growth for multi-establishment firms was also due to entry and exist of establishments within the multi-establishment firms, the rest being productivity growth of surviving establishments."*¹³

Similar findings have been identified for US data.¹⁴ Policy uncertainty could therefore discourage productivity promoting entry and exit by firms, and policies that raise entry and exit barriers could interact via real options effects to further suppress entry and exit.

The costs of uncertainty also suggest that government incentive schemes may impede the behaviours they set out to encourage if they raise uncertainty. For example, an uncertain investment tax credit (where the government, or successive governments change their policy on tax credits over time) may increase or decrease investment depending on real options effects.¹⁵

2.6.2 Principal-agent relationship

Performance can be improved in many situations by relating pay to outcomes. However, outcomes depend to some extent on factors outside an employees or organisations control and, given individuals risk aversion, basing pay too closely on variable outcomes is counterproductive. Analysis of this principal-agent problem shows that for the efficient contract the relationship between pay and profit is inversely proportional to the variance of profit, and proportional to the responsiveness of profit to employee effort. For example, an empirical study of subcontracting in the Japanese automobile industry found support for the former

7 Avinash Dixit. 1992. "Investment and Hysteresis". *Journal of Economic Perspectives*, Vol 6(1).
8 Grossman & Hart. 1983. "An analysis of the principal-agent problem". *Econometrica*, 51.
9 Jeremy Stien, Stephen Usher, Daniel LaGattuta, and Jeff Youngen. August 2000. "A comparable approach to measuring cashflow-at-risk for non-financial firms". NERA Working Paper #39 (www.nera.com).
10 Ricardo Caballero & Robert Pindyck. 1996. "Uncertainty, investment, and industry evolution." *International Economic Review* 37(3).
11 Simon Price. 1996. "Aggregate uncertainty, investment and asymmetric adjustment in the UK manufacturing sector". *Applied Economics*, 28.
12 Avinash Dixit and Robert Pindyck. 1994. "Investment under uncertainty". Princeton University Press.
13 Richard Disney, Jonathan Haskel, and Ylva Heden. April 2000. "Restructuring and productivity growth in UK manufacturing." Draft paper available at <http://www.qmw.ac.uk/~ugte193/pbr.html>.
14 Lucia Foster, John Haltiwanger, C J Krizan. November 1998. "Aggregate productivity growth: lessons from microeconomic evidence". NBER Working Paper 6803.
15 Hassett & Metcalf. 1999. Investment with Uncertain Tax Policy: Does Random Tax Policy Discourage Investment?. *The Economic Journal*. Vol 109 (457).

theoretical conclusion – the price paid to subcontractors adjusts more to changes in costs (incentives are lower powered) the larger the fluctuations in costs.¹⁶

Agents with superior ability will also tend to seek opportunities where exogenous uncertainty is lower (in other sectors or countries) so that they can enjoy a package with a stronger performance pay element. The strong dependence of the value of utilities, for example, on the (uncertain) outcome of periodic price reviews by regulators in the UK could be expected to have such an impact.

2.6.3 Free cash flow and cash flow at risk

Variance in cash flows can have an adverse impact on firms' capital budgeting decisions – thereby undermining their value. While this claim may appear at variance with "standard" capital budgeting theory, there are sound reasons to expect uncertain returns to undermine efficient innovation and investment.

Increased volatility of returns increases the risk of financial distress that in turn undermines agency relationships within the firm, and undermines the ability to develop relationships with others such as subcontractors. Increased risk may also make investments with a negative present value "profitable" for shareholders (and management) since risk increases upside potential, while downside risk is limited to the value of equity, with bondholders bearing any residual risk. Policy uncertainty, by increasing cash flow at risk, may therefore harm efficient investment and innovation.

3. Policy Implications

The problems of policy uncertainty, and its policy implications, have been considered extensively in the macroeconomic context. In the UK the creation of an independent central bank with clear policy targets and accountability was designed to reduce discretion and policy uncertainty. In this context the following principles have been put forward:¹⁷

- "stability through constrained discretion";
- credibility through sound long-term policies;
- credibility through maximum transparency;
- credibility trust through pre-commitment".

However, the costs of policy uncertainty, and the problem of commitment, are also important considerations in microeconomic policy design and evaluation. However, it is difficult to devise a set of rules that apply to the diverse set of microeconomic policy situations, and the efficient policy may change due to changes in circumstances or understanding.

3.1 Principles for Sound Microeconomic Policy

The policy challenge is to constrain regulatory discretion, while enabling desirable change. Since behaviour is determined by expectations of future policy, policy predictability is also likely to be important. Clear long-term policy goals, and transparency of such policy goals are important determinants of a stable and predictable microeconomic policy environment. However, institutional mechanisms that facilitate constrained discretion are also essential where optimal policy *ex ante* and *ex post* differ. In summary, the following two principles are put forward to govern microeconomic policy:

- The adoption of consistent and transparent long-term policy goals.
- Implementation of institutions that ensure transparency and due process in policymaking and implementation, backed by accountability requirements and rights of appeal.

3.2 Policy Formulation

Policy should be built on a sound theoretical and empirical base. While considerable research exists which aims to identify the impacts of microeconomic policy variables on outcomes such as investment and productivity growth, uncertainty and policy uncertainty *per se* are often not considered as explanatory variable. Attention tends to be focussed on considering alternative regulatory "states", with less attention on the probability of transition between alternative states.

However, theoretical developments in economics including real options (which shows that diversifiable risk can impact on investment, entry and exit decisions), agency theory (which shows that efficient contracts depend on uncertainty), and developments in corporate finance (that suggest a relationship between overall risk and corporate decision making) all point to policy uncertainty as a potentially important variable in the link between policy and productivity growth. Policy guidance should also therefore promote the explicit consideration of uncertainty (including policy uncertainty) in evaluating policy alternatives, and research (and data collection) should aim to address the current paucity of empirical evidence on the linkages between policy uncertainty *per se* and outcomes.

3.3 Achieving Constrained Discretion for Microeconomic Policy

Transparency can help reduce the scope for discretion since decisions are more likely to be reached on the basis of observable data and replicable methods, and poor decisions will be more open to challenge. Transparency can also increase the legitimacy of decisions, thereby reducing the risk of future policy reversals (anticipation of which will tend to undermine the intended response).

The proposed Freedom of Information Act should assist in improving transparency – but should be amended to cover policy advice. Policy advice is covered by similar legislation in other countries, and the approach has arguably proved both workable and useful in sharpening the quality of advice and debate.

Another example of a mechanism that can constrain discretion is a written constitution. For example, in the US the 5th Amendments to the Constitution provides fundamental protection of property rights "No person shall...be deprived of life, liberty or property without due process of law, nor shall private property be taken for public use, without just compensation." Well-framed constitutional rights can increase stability and predictability. For example, the *Hope Gas (1944)* and other decisions based on the 5th and 14th Amendments to the US Constitution have provided utilities with an assurance that regulatory discretion is constrained. Article 1 of the European Convention on Human Rights may prove to provide some protection for property rights. Short of constitutional rights, governments can constrain their own discretion via treaties and agreements.

In addition to "rules", discretion can be constrained by detailed requirements in terms of administrative procedures (due process). A system of administrative procedures might, for example, aim to

16 Seiichi Kawasaki and John McMillan. 1987. "The design of contracts: evidence from Japanese subcontracting". *Journal of the Japanese and International Economies* 1, 327-349.

17 Edward Balls. 1997. "Open macroeconomics in an open economy". Centre for Economic Performance Occasional Paper No 13.

ensure that evidence used in policy or administrative decisions must survive the scrutiny of many parties, and that decisions are based only on such evidence as survives scrutiny. Procedures might be set down in law, for example, requiring the submission, rebuttal and cross-examination of any testimony, and detailed explanations of decision by executive agencies. Such a system of administrative procedures comprising transparent processes may open up decisions to appeal, and the desire to avoid appeals means that decision makers can be expected to take more care to ensure that the most reliable evidence is used to justify their decisions and that their decisions are consistent with agreed long term policy goals.

An example in terms of procedural rules is the US Administrative Procedures Act of 1946 that sets out administrative rules and procedures that must be followed by government agencies. For example, Section 556 of the Administrative Procedures Act sets out the procedures for taking evidence, states that the burden of proof lies with those proposing a change, and establishes that each party shall have the right to submit testimony (oral or written), to rebut the testimony of others, and to conduct such cross-examination of other parties *"as may be required for a full and true disclosure of the facts"*. Short of such legislation, there may be scope to achieve similar outcomes via guidance developed, for example, by the Cabinet Office and the UK Better Regulation Taskforce (or at the European level via the Mandelkern Group on Better Regulation).

Finally, a degree of policy uncertainty is inevitable. The question then is how to minimise its cost. By examining the interaction between policy uncertainty and other policy variables, the costs of residual policy uncertainty can be minimised. For example, the real options literature suggests that uncertainty and the costs of entry and exit interact to raise entry and exit thresholds. This analysis would suggest, for example, that taxes and unnecessary regulatory impediments to "transactions" would be a priority for removal.

