

Grand Designs versus Bean Counting: Creative Cycles in Firms

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Abstract

Decisions to authorize projects that involve innovative engineering, design or styling present a creativity dilemma: boldness may require greater financial risks to be taken, or a bigger risk of failure from a given scale of investment, but conservative strategies may result in poor financial performance if rivals succeed with bolder strategies.

Uncertainty associated with creative boldness makes it difficult for financial staff to judge whether bold creative proposals are being championed by creative staff purely out of self-interest rather than in the interests of the organization. The use of external reference standards and/or a reliance on reputations is argued potentially to result in tendencies towards creative overshooting that is then followed by conservative strategies that focus on cost cutting, rather than equilibrium growth trajectories for firms. Other trajectories are also considered and a pluralistic approach to this area of the theory of the firm is advocated. The conclusion stresses that creative overshooting is not necessarily socially inefficient even if it proves costly for those who bear financial risks.

Keywords: research and development; creativity in organizations; pluralism; decision making under uncertainty; financial instability hypothesis

JEL classification codes: D21, D79, D92, O31, O33

1. Introduction

This paper focuses on dynamic aspects of the relationship between those who develop new technologies and design or style new products, and those who look after the financial wellbeing of the organizations in which invention and innovation take place. Tension will be prone to arise between these groups due to their different backgrounds and interests making them likely to take different views of how to resolve a creativity dilemma that is inescapable in a world of technological change: how bold should a firm be in pursuing new technologies and/or with the designs and styling of its products? Radical new technologies and products involve financial risks since making them work may turn out to be beyond the capabilities of the firm, or they may run ahead of what potential customers find acceptable. At the other extreme, conservative strategies that allow only incremental changes and products designed to offend no one may also have disastrous financial consequences if bolder rivals succeed in making new technologies work and change what customers expect. The key message of this paper is that there are good reasons for expecting that many organizations will swing between boldness and conservatism rather than achieving steady developmental trajectories.

The analysis of innovation proposed in this paper differs substantially from that presented by Clayton Christensen (1997) in his influential book *The Innovator's Dilemma*. Christensen sought to show how, as a new technology emerges in an industry, leading suppliers of the existing technology are prone to focus on making incremental improvements rather than switching to the new technology. This happens not because they are unaware of the new technology appearing on the horizon but because its advantages are not required by their traditional customers and initially come at the cost of it being less effective at doing what these customers want. He

argues that firms typically fail to see the new markets that would be opened up by the benefits of the new approach and the potential for developing it into something that would eventually comprehensively outperform the earlier technology.

Christensen is thus concerned with the potential consequences of being conservative rather than bold. He seeks to show that firms that were bold in pioneering a particular technology tend ultimately to fail because their success leads them to underestimate the threat posed by a new generation of bold innovators. In this paper we similarly emphasize the difficulties of estimating the payoffs to innovative projects but our focus is on firms that may overshoot in their creative boldness with the result that they either founder financially or swing unduly in the direction of conservatism as they try to recover from creative excess.

The approach taken in this paper also differs from the analysis in Neil Kay's (1979) book *The Innovating Firm: A Behavioural Theory of Corporate R&D*. Kay contends that uncertainty makes it impossible to allocate resources between projects in a reductionist 'bottom-up' manner on the basis of their prospective net returns. Because of this, he suggests that resource allocation proceeds in a 'top-down' manner based on decision rules for dealing with trade-offs between different categories of spending on new projects (for example, between research and development, then, from the research budget thus defined, between pure and applied research, and so on, down to increasingly details categories and, ultimately, to individual projects). Kay's approach treats the firm's environment as sufficiently stable for reliable decision rules to be developed. However, decision-makers may find it difficult to treat such choices as if they are routine where they could have a great impact, for better or worse, on the fortunes of the firm as a whole. This will be particularly so if decision-makers are aware that they and their counterparts in rival organizations face a major patent race

or standards war, or could be embarking on ‘game-changing’ projects and attempting to impose major surprises on each other.

We examine the creativity dilemma by bringing together Hyman Minsky’s (1974, 1975, 1986) ‘Financial Instability Hypothesis, Joseph Schumpeter’s (1943/1992) views on the role of ‘gales of creative destruction’ in the evolution of the economic system, and organization-focused approaches to the theory of the firm such as those offered by Cyert and March (1963) and Williamson (1964, 1975). Minsky’s work, like the present paper, focuses on risk-taking in a way that sees swings in the willingness to take risks as an inherent part of modern capitalism. However, despite having had Schumpeter as his PhD supervisor, Minsky did not examine the significance of the creativity dilemma as a possible source of instability. Rather, he simply picked up Schumpeter’s interest in the significance of innovation in the financial sector, which he integrated with Keynes’s (1936) *General Theory of Employment, Interest and Money* (Whalen, 2001). He thus concentrated on changes in debt/equity ratios and asset values in the context of markets for financial assets and real estate, and the consequences of financial innovations and multi-layered linkages between the balance sheets of different players in these markets.

The Global Financial Crisis that emerged in 2007–8 has provided striking evidence of the power of Minsky’s analysis. However, a focus on the disastrous consequences of issuing and securitizing sub-prime mortgages and building portfolios around financial innovations such as collateralized debt obligations is in danger of diverting the attention of economists from investment-related sources of instability associated with new products and production processes outside the financial sector. At the macroeconomic level, the dot-com bubble a decade earlier is closer to the focus of this paper: there, suppliers of finance were placing their bets on the basis of

inherently vague promises in a novel sector where the competitive rules of the game were frequently dominated by network externalities and near-zero marginal costs, thus offering potential for massive first-mover advantages (see Earl and Mandeville, 2009). Here, however, rather than focusing on interactions between start-up organizations and suppliers of venture capital in a frontier kind of industry, we focus primarily on how innovative projects get authorized in established firms. We explore the interaction between those seeking funding for creative activities to develop novel consumer products and capital goods, and those who control access to the resources necessary for turning these creative visions into reality. This makes it necessary to venture into the literature on the theory of the firm that focuses on organizational aspects of corporate behaviour in order to understand the interplay between the creativity and financial health of a firm.

In picking up Minsky's missed opportunity to consider the relationship between the financial health of businesses and the creative processes that drive Schumpeter's 'gales of creative destruction', we do not offer anything resembling a rigorous formal model. Rather, what we offer is a discussion of 'mechanisms' in the sense advocated by Elster (1999, chapter 1), that is, causal chains that are consistent with observations of observed patterns of behaviour and which can account for entities differing in the styles of behaviour they display in particular categories of context. The uncertainty at the heart of the creativity dilemma precludes reducing the situation to a well-defined game between those who advocate projects and those who control the purse-strings. Rather than being determined by situational logic, these choices take what Latsis (1972) calls a 'multi-exit' form and will depend on the ways in which individuals try to cope with uncertainty: systematically different patterns of behaviour will emerge depending on which 'ways' of choosing are employed.

The paper is structured as follows. In section 2 we adapt Minsky's taxonomy of classes of financial exposure that investor may incur from asset markets to investments in research and development. In section 3 we examine the key sources of uncertainty associated with such investments and areas in which risk management may be possible. These uncertainties open up potential for principal-agent problems between financial managers and creative staff, and these are discussed in section 4. Section 5 integrates material from the previous three sections to show why it would not be surprising to observe organizations oscillating between bold creativity and financial conservatism. Section 6 explores mechanisms consistent with a variety of alternative trajectories that can also be observed. Section 7 concludes.

2. Innovative projects and business risk

The perceived boldness of an investment can be measured by the range of possible outcomes that are imagined by those involved in advocating and authorizing it. A project that involves something radical that could be a 'game-changer' but which no one involved in authorizing it can see as capable of failing and generating significant losses would not be classified as bold. Rather, a bold scheme involves possibilities of both significant returns and significant losses. For finance staff involved in the authorization process, the key concern will be downside financial risks.

Minsky distinguishes between three types of financing that have very different risk implications:

1. *Hedge finance*: expected income flows from assets can cover both interest and principal repayments on debts within the time period under consideration.

2. *Speculative finance*: expected income flows from assets are at least sufficient to service interest obligations when they fall due but repayment of principal is expected to require the sale of assets or access to income from another source. Hence for the investment strategy to be profitable there will need to be capital gains of sufficient size by the time the principal falls due for payment.

3. *Ponzi finance*: expected income flows from assets are insufficient even to meet interest charges, so additional funds have to be borrowed in increasingly large amounts to honour interest obligations. Hence, to stay solvent in the long run, the borrower will need to achieve a big enough capital gain from the investment to cover the additions to the initial principal accumulated from successive additional borrowing to meet the interest gap.

Creative activities such as research and development (R&D) are somewhat problematic to fit into this framework since they involve using finance to generate means of earning revenue at a later date. An individual R&D project thus inherently looks like a case of Ponzi financing until it results in something that can be sold, whether in the form of the rights to a new technology or output of a new product. This is in sharp contrast to, say, an investment property or financial asset that can generate revenue from the moment it is purchased. However, most firms that undertake R&D have revenue streams and financial obligations from past investments. These firms will not always be financing new projects by taking on more debt or floating new shares but, even so, their owners will be concerned about the kinds of risk presented by new projects.

Such considerations imply that when extending Minsky's perspective to the context of the innovating firm our focus should be on the extent to which a new project, or bundle of new projects, may pose a threat to the firm's overall viability. We therefore suggest the following three-way classification for these kinds of projects:

1. *Innocuous*: the firm could abandon a particular new project or set of new projects completely and either write off the sunk costs against reserves or meet, *via revenues from existing projects*, any additional interest and principal repayment obligations that arose from the new project(s) as well as being able to meet its pre-existing interest and principal repayment obligations, pay normal dividends and not suffer net depreciation in its assets. This would be possible in cases where, for example, a firm was earning super-normal profits from past investments and had 'money to burn' on projects that, on the one hand, might be complete failures but, on the other hand, might seem to have the potential to be a game-changing 'money-spinners'. This would be the short-term position of, say, a major pharmaceuticals company enjoying super-normal earnings from patent-protected drugs. To enjoy such a position in the long term, however, it will need to achieve a high enough success rate with its R&D to generate replacement earning stream for those of its products who reach patent expiry.
2. *Potentially embarrassing*: taking on the project (or bundle of projects) will not put the firm at risk of insolvency even if it is necessary to write off completely this investment since the firm will still be able to service its

interest and principal repayment obligations, including those incurred to fund the project(s), with earnings from earlier investment. However, if the new investment(s) fails to earn (on average) a normal rate of return the firm will be unable to offer large enough dividend to satisfy shareholders and/or will be unable offset depreciation of its assets. In this case, the success of new projects is not crucial for the firm's immediate survival, but there is some risk that the management team will be ejected and that the firm will get taken over. Here the firm is risking more on the new project(s) than can be written off without some kind of embarrassment: it is staking more than the money (if any) that it has 'to burn'.

3. *Potentially toxic*: the scale of investment in the new project (or bundle of new projects) is so great relative to the firm's existing operations that failure to complete the project(s) on time or on budget and/or generate expected revenues will result in the failure of the company itself because the growth in its debt servicing obligations takes its total debt burden beyond its earnings on existing projects—quite apart from being able meet shareholder dividends or replace depreciated assets. A classic example of a toxic project is the contract Rolls-Royce signed with Lockheed to develop and manufacture the RB2-11 jet engine for the Lockheed Tri-Star airbus, which resulted in Rolls-Royce going bankrupt in 1971. Where a potentially toxic project does indeed fail, it is still possible that the project could eventually be a commercial success in the hands of another company that purchases the assets of the original firm below replacement cost. (The RB2-11 jet engine did get built—after the British government first nationalized the failed Rolls-Royce and then

refloated it as a new company.) Projects that come into this category will only get selected if they seem also to have potential to ‘make’ the firms by rewriting the rules of the competitive game: decisions to select such projects thus come into Shackle’s (1961) category of ‘crucial decisions’.

For a given level of financial obligations, the potential toxicity of a firm’s investments will depend on the number of projects being funded and the relationships between these projects and with the firm’s existing activities—in everyday parlance, on whether the firm has ‘all its [creative] eggs in the one basket’ (see Kay, 1997). A firm can attempt to hedge its bets by investing in a variety of small projects, for example, a set of incremental improvements to a range of existing products. It thereby insulates itself against the risk of suffering a catastrophic failure due to changing external conditions or the discovery that a new technology proves unworkable. However, these small projects may prove uncompetitive against those of rivals who take the risk of being less diversified and achieve a spectacular creative breakthrough.

Firms that invest successfully in creative activities will squeeze the earnings of rivals that try to keep producing and marketing what they are already offering. In the long run, standing still is not an option. However, in some cases it may be profitable to keep making small investments in incremental improvements to an existing technology while rivals are trying to gain a competitive edge by doing something more radical: by following such a strategy, it may be possible to skip the second-generation technology and then jump to a third generation technology that renders both the first- and second-generation technologies obsolete. (An example of this would be where carmakers do not invest in petrol-electric hybrid vehicles and instead keep improving turbo-diesel engines and conventional transmission systems before

switching to electric- or fuel-cell-powered vehicles.) A firm that delays being creative will eventually find the value of its existing assets falling as sales are lost to more modern rival products, so an ‘innocuous’ investment strategy may cease to be a survival option unless the firm is able to cut the costs of improving its products by largely copying what its rivals have done.

3. Causes and consequences of risk assessment problems with creative projects

Genuinely creative projects do not lend themselves to being encapsulated in business plans that show prospective cost and revenue trajectories. Quantitative planning is made problematic by four kinds of uncertainty:

1. *Technological and managerial uncertainty*—i.e., whether or not a concept can be made to work at all, at what cost (including the cost of the diversion of scarce management attention from existing activities: see Penrose, 1959), and by when.
2. *Market uncertainty*—i.e., how potential customers will react to it, which may sometimes be very hard to gauge until a working mock-up can be shown to them
3. *Uncertainty about competitive investment*—i.e., the need to make guesses about the extent of investment in rival products, the prices at which these will be offered and their non-price characteristics.
4. *Uncertainty about complementary investment*—i.e., the need to guess the extent to which other firms can be relied upon to make upstream or

downstream investments. Inadequate complementary investment could increase the costs of making or marketing the new product.

These uncertainties open up scope for coalition-building and boardroom rhetoric to play key roles in investment decisions regarding innovative projects. The third and fourth kinds of uncertainty arise even in markets where there is no innovation and the market demand function is well known (Richardson, 1960/1990). However, in a Schumpeterian world, they are much more challenging because they have ramifications for market uncertainty.

As regards competitive investment, the problem shifts from being associated purely with gaps in intelligence about the volume of capacity rivals are creating and becomes more a problem of not knowing the capabilities and release dates of innovative products on which rivals are working. New factories can be observed from the outside, but what they are for requires inside information. A product may turn out to be much less of a leap forward than was anticipated by its developers if they get taken by surprise by the boldness of what their rivals have been doing. This could result in smaller sales to more adventurous consumers but higher than expected sales to conservative consumers who find the product less challenging than they were expected to do because they are now viewing it against its more radical rivals.

As regards complementary investment, bold projects increase the challenge of liaising with supply chain participants to ensure they are able and willing to supply particular inputs to the new product's manufacturing and marketing process. If managers in these other firms are sceptical of the product's chances, they may be unwilling to invest in being part of its value chain and force the firm into vertical integration (Silver, 1984). While a firm is trying to get complementary organizations

to cooperate it runs the risk that information about its new product will seep from the latter to its rivals. There is also the issue of complementarity on the demand side: the value of a product to potential customers will depend on what connections it enables them to make with other products. This will in turn often depend on the emergence of technological standards and upon investments being made in these complementary products and on how soon the latter are released. For example, at the time Kodak was first working on developing digital cameras, home computers were not on the horizon and Kodak envisaged a future in which consumers would be buying photographic prints from its shops, rather than a world in which consumers printed their own hard copies at home or stored their photographs purely electronically and viewed them on computers, digital televisions, electronic photo-frames and other media players. A more recent but related example of complementary investments affecting the value of products to consumers and the use they make of them concerns the ‘apps’ for Apple’s iPad or iPhone. In many cases, a product will need to be well advanced in its development before it can be shown to the potential producers of complementary products and/or before the latter become convinced that it is worth investing in something to connect with it. Customer clinics and focus groups may provide limited guidance to the fate of a product if it takes extended periods of actual use before consumers discover what they really want to do with it and develop new habits of use (cf. the discussions of the transition to digital imaging in Runde *et al.*, 2009).

In trying to cope with these uncertainties, managers can shape the extent of exposure their organization faces in respect of its investment spending by taking account of factors such as:

- *Whether the project requires capabilities different from those employed in the firm's existing activities* (Penrose, 1959; Richardson, 1972). For example, when the British restaurant food and hotel conglomerate J. Lyons & Co. began developing the LEO digital computer in the late 1940s it was getting into an area far removed from anything it had done before, even though the project's goal was for the LEO to be used within the firm's traditional areas of business, thereby giving the firm a competitive edge. Though the LEO project was surprisingly successful, J. Lyons & Co. eventually decided against trying to become a major player in the area and instead merged its LEO subsidiary with English Electric. (Ironically, Lyons's subsequent concentration on its traditional lines of business proved unsuccessful.)
- *The extent to which the project breaks new technological ground in design or in its manufacturing process.* Some new projects involve no more than incremental, evolutionary innovation based on established technologies and concepts. In such cases, precedents may assist in the formation of reliable expectations. Much more risky are projects involving radical innovations that may revolutionize how a product is made, what it can do or how it appears to its customers. Here, the crucial issue may not be the proportion of the end product that is new but whether or not a core aspect of it is novel. For example, when BMW pioneered the automotive application of a CANBUS multiplex wiring system in its 1987 E32-generation 7-series, there were major benefits to the customer in the form of complex control options. However, had the system been unreliable it could have had consequences way beyond warranty costs, including plunging residual values, lost goodwill and a catastrophic impact on the firm's reputation—despite the quality of the rest of

these vehicles. On that occasion, BMW succeeded, but fifteen years later, the firm was less successful with its next bold step in automotive electronics, the iDrive user interface in the E65 generation of its 7-series car. As the Wikipedia (n.d.) entry on the vehicle notes, ‘Early production E65s were fraught with problems, the vast majority of which were caused by software issues, not least the lack of functionality of BMW iDrive. BMW repurchased a substantial number of 2002 and 2003 7 series cars in the USA.’

- *The extent to which the end product is radically different from what its intended customers have come to expect.* If it offers more novelty than potential customers can handle, it may be a sales disaster or only gradually generate revenues as customers adjust slowly to it. For example, while those who did purchase the 2002 E65 BMW 7-series often experienced problems with its iDrive, there was initially widespread resistance to the car due to its radical styling under the firm’s new chief designer Chris Bangle and the purportedly bewildering nature of the iDrive control system. The model was eventually very successful—after a heavy investment in sorting out the technical problems and an early major facelift to tone down the front and rear styling. The risk of customer resistance to new technologies can sometimes be managed: for example, the digital photography revolution could have involved cameras that bore far less resemblance than they did to those from the era of film-based photography but the manufacturers set customers at ease with familiar locations for controls and even incorporated digital samples of the sounds of traditional shutters to signify that a photograph had been taken (see Runde *et al.*, 2009).

These three issues may be labelled as sources of creativity risks. However, it should be emphasized that conservative projects do not always involving smaller outlays than more radical alternatives might have entailed. Big budgets that come without demanding creative aspirations do not encourage clever thinking in the way that tightly constrained problem solving often does. Product improvements that are merely incremental in conceptual terms can turn out to be needlessly expensive. Ford Australia, for example, can cope with a small market by developing successive generations of ‘new’ cars at a tiny fraction of the cost that Ford US would incur for comparable vehicles. Just as the proverbial ‘grandfather’s axe’ might, over the years have been through several heads and half a dozen handles, so Ford Australia’s Falcon has completely changed over five decades via a stream of gradual improvements in components rather than a succession of models that were ‘new from the ground up’. The impact of budgetary pressure on creativity at Ford is illustrated by Carey (1996: 36) with reference to cupholders: elaborate but one-size-only and dangerous in the US Ford Taurus versus simple and safely able to hold a variety of different containers in the Australian Ford Falcon. He comments that ‘the contrast between the Taurus and Falcon *vis-à-vis* cupholders is stark; over-design, over-spend and underachievement versus budget-priced practicality.’ Such an example leads to the question of why the financial ‘bean-counters’ in firms may go for long periods without impose tighter controls over creative spending of the kind they require at other times.

4. Principal–agent issues in creative organizations

Except in cases where the instigators of a project provide all of its funding, decisions to process with innovative projects involve potential for conflicts of interest and a principal–agent problem. Some players will have a personal interest in the project

going ahead, whether because of the kudos it will bring to their careers if it is successful, the status that will come from being given command over resources necessary for its execution, or simply delight from being able to turn their visions into reality. However, if they are merely salaried employees they may stand to lose rather little if things go wrong (cf. Jensen and Meckling, 1976). They may suffer damage to their reputations if it runs into difficulties but the damage to their wealth will otherwise be limited to the extent of any loss on shares they hold in the company. The more they are remunerated via a salary rather than being paid on the basis of the results they achieve, and the harder it is for prospective alternative employers to know to what extent they were responsible for catastrophic grand designs, the less incentive they have to be circumspect about the risks associated with the projects that they champion.

Where access to information differs between parties to a decision, or between internal and external parties, and where people differ in the expertise that they can bring to interpreting the information to which they have access, there may be considerable potential for those with 'grand designs' to get away with guileful, self-serving behaviour that would not be sanctioned in a world where there were no divisions in access to information and knowledge. The temptation to advocate projects out of personal interest might be somewhat attenuated in firms that have an M-form, profit centres-based structure insofar as failure will be penalized by denial of resources for future projects. However, this restraint may be limited by the potential for a divisional head who has championed a failing project to move elsewhere before its difficulties are widely known and then blame the fiasco on those that followed them.

A proposed innovative venture could thus be a ‘pet project’ (Williamson, 1964) of creative staff engaging in ‘opportunism’ because they recognize that a situation of ‘information impactedness’ prevails (Williamson, 1975). However, it could also be the case that the project champions do not believe they are behaving with opportunism because their cognitive processes cause them to engage in wishful thinking to make the project seem potentially viable and thus consistent with their personal reasons for wanting it to go ahead (cf. Festinger, 1957; Steinbruner, 1974, chapter 4, and the discussion of the case of the Convair 880 airliner fiasco in Earl, 1984, pp. 95–7). Indeed, creative agents may be genetically programmed to over-estimate and over-represent their capacity to handle challenges inherent in the projects that they advocate: recent work by von Hippel and Trivers (2011) argues that there are good evolutionary reasons for humans to have developed tendencies towards self-deception, since acting more confidently than is really justified when facing a foe (by ‘puffing oneself up’ in various ways) increases the chances of the foe backing away.

In extreme cases, shareholder interests may be neglected because those who want to see a particular bold project go ahead dominate at board level and are therefore able to outvote other board members. This is essentially what underlay the bankruptcy of Rolls-Royce: as Grant (1977, p. 96) notes, ‘The inspectors, when asked to comment on the case, commented that at Rolls-Royce “the personalities on the financial side were outgunned and out-numbered by those on the engineering side”.’ In many cases, however, project champions will need to win support from finance-focused colleagues. Wherever there is acute uncertainty about a creative project’s potential costs and revenues, the latter have to follow their instincts. But what their instincts tell them to do may be affected by the rhetoric of those who act as champions for the project. Finance staff may suspect they are being deliberately

‘blinded with science’ or that creative staff are giving overly rosy assessments of how easy it will be to run the project successfully, and they may worry about the likelihood of requests for budget extensions. But the less expertise they have in common with their creative colleagues, the less they are in a positions to know how sceptical they should be about the claims that are being made.

Of course, experienced financial staff are likely to be wary of the ‘grand designs’ of their creative staff and know that, where projects do run into difficulties after gaining approval, they will have a battle on their hands to limit budgetary escalation. In such situations, it is unlikely that creative staff will suggest that the project was a mistake that should be abandoned. Indeed, anyone involved in approving the project (including the financial officers who ultimately agreed to it) will be prone to succumb to ‘sunk cost bias’ because their credibility is in question and remaining uncertainty provides opportunities for claiming that, with more resources, a floundering project can be made to come right. Moreover, if outsiders do not share the vision of the creative staff, the assets associated with an uncompleted project may have poor market value relative to what the creative staff see as their prospective value once the project has been made to work. If budget extensions result in the end product being workable they may thus earn disproportional marginal return even if sunk costs can only partially be recovered.

These kinds of issues are familiar to players in, for example, the construction sector, where it is well-known that contractors are prone to ‘underestimate’ project costs in order to win approval. Even so, they persist due to the division of knowledge between the various specialist agents and principals. Herbert Simon (1991: 97–100) raises the issue of architects’ disdain for the interests of their clients as he recalls in his autobiography his experiences of teaching urban land economics to architecture

students at Illinois Tech. At the time, the chair of its Department of Architecture was and Mies van der Rohe of Bauhaus fame. Simon (1991: 99) comments that:

[His gospel was that] the architect was an artist whose task is to build beautiful buildings (or cities) either in collaboration with or despite the client.

Any rights of the client to determine the amount of resources to be applied to the task, or the functionality of the final structure, were not included in Mies's view. On the contrary, the client was to be educated, persuaded—I won't say duped—to contribute the resources necessary to produce a great work of art, as defined by the architect. The client was an instrument, a means. ...

[M]y subsequent encounters with architects have taught me that this attitude was not peculiar to Mies but is widely shared through the profession. Architects are notoriously prone to design buildings that are bid in at 40 percent over the agreed budget.

Evidence of architects focusing on aesthetic matters without regard to the impact on costs or completion time abounds in Sabbagh's (1989) study of the construction of Worldwide Plaza in New York. It ranges from dithering over brick colours to petulance if anyone dared suggest that the roof—whose complexity was for purely architectural reasons (p. 248)—did not need to be made of copper to achieve its green visual effect (p. 250). Along the way were many instances of 'drawing creep' (p. 77), that is to say, additional refinements of designs that everyone else thought were finished. Sometimes the architects kept very quiet about the drawings they were making, and then engineered a *fait accompli* by pointing out that if the property developer and/or construction management company did not like the designs then it

would take four or five months to redraw them. Regarding the wishful thinking issue, Sabbagh (1989, p. 60) observes that ‘Since both owner and construction manager want the project to happen, a certain amount of wishful thinking and finger-crossing helps them arrive at pleasing rather than entirely realistic estimates’. He goes on to point out that professionals involved in the process know from experience that this goes on and that the inking in of details will add extras to the cost, but they never know in advance to what extent they are being kidded (p. 61).

5. Creativity cycles: The ‘creative instability hypothesis’

Given the agency problem and all the uncertainties associated with creative projects, decisions about the extent of creative boldness within firms appear to lack solid foundations and be open to tidal shifts driven by changes in beliefs amongst those involved in authorizing projects. If allowing grand designs to proceed fails to deliver competitive advantages and returns to shareholders, the mood of authorising committees and boards may swing towards conservatism, possibly excessively so, and a focus on becoming more profitable by making incremental improvements and discovering ways of cutting costs. The situation could be rather akin to the way that democratic political systems swing periodically between favouring parties that promise radical reforms financed if necessary by borrowing or taxing the rich, versus parties that advocate a focus on avoiding waste in public sector spending and aim to achieve fiscal balance. In both cases, it may take only a small proportion of voters to switch their preferences for a major change to be brought about.

In this section, we will argue that there are good reasons to expect such cyclical swings between creative boldness and conservatism in firms. Our proposal complements the suggestion of Cyert and March (1963) that managers give

‘sequential attention to goals’—a suggestion that was applied by Mosley (1976) to the politics of macroeconomic management. However, our analysis works rather differently. In the Cyert, March and Mosley analysis, the key driver of cyclical behaviour is bounded rationality, produced by finite information processing and memory capacities and the limited attention span of managers. This results in a failure to perform value-integrating tradeoffs of the kind envisaged in conventional microeconomics and leads instead to a focus on whether or not targets for particular hierarchically ranked values are being met. Focussing attention on the highest-priority un-met goal may result in decisions that allow that target to be met. However, due to the inability to think through all the implications of a change of policy, success in respect of that target comes at the cost of causing failure to meet aspirations for another goal, with attention then shifting to designing a policy to meet that goal, and so on.

In our analysis, the focus is not on bounded rationality but on (i) the problem of dealing with fundamental (non-probabilistic) uncertainty (initially identified by Knight (1921), subsequently emphasized by Shackle (1961) and delineated from bounded rationality by Dunn (2000) in the context of the firm) and (ii) the impact of outcomes on the credibility of claims made by different players involved in collective choices about significant projects. Our analysis could be said to have more in common with Thompson’s (1979) vision of how controversies involving clashes of world-view (for example, regarding curriculum design) tend to be characterized by oscillating policies. Thompson encapsulated his perspective geometrically via catastrophe theory but space limitations preclude us from emulating this in the present paper. However, though our view of oscillating corporate behaviour has different foundations from that of Cyert and March, it complements their thinking regarding

the concept of ‘organizational slack’ as something that arises because members of the organizational coalition do not know how far they can push their interests without causing the coalition to break down. If the financial ‘bean counters’ could be certain that the authorization of ‘grand designs’ would prevent the firm from meeting key performance indicators, they would refuse to support such projects. In the face of uncertainty, they may err by supporting overly bold projects but then get more assertive as the consequences of doing so become apparent. If the creative staff put up with being reined in and do not defect to other organizations, then we have a case of what Cyert and March would call ‘the uptake of organizational slack’.

Before we set out our analysis, it is important to consider the possibility that despite the barriers to making quantitatively-based assessments of creative projects, firms could achieve steady innovation trajectories due to their ‘bean counters’ being consistently assertive after getting familiar with the grandiose tendencies of their creative colleagues and the latter therefore moderating the claims that they make as project champions. This might indeed hold in organizations that largely relied upon internal labour markets to generate senior staff, as in the ‘Japanese model’ of business that sets out to align employee and organizational interests by attaching a person’s standing to their years with the organization and focusing on the benefits of making long-term commitment to the organization (cf. Adams and Kobayashi, 1969). However, it seems unlikely to hold in organizations that have ‘revolving door’ tendencies—in other words, where staff only serve for short periods before moving on to other organizations, their reputations arising from the boldness of what they were able to get underway rather than the long-term consequences of the decisions that they took.

The latter phenomenon is something that Saul (1993) associates with the rise of the MBA qualification and a consequent tendency to see management as entailing the use of a set of generic capabilities such that, say, the head of an airline might readily switch to running a major brewery, and thence to running a retail chain before moving on to an insurance company (cf. the career of former Qantas head, James Strong). Creative staff may be similarly mobile if not locked in by long-term contracts and covenants that prevent them from working with rival organizations. (These lock-in arrangements will be used where there is a risk of rival firms being leaked intellectual property by staff that defect to them or, in the case of, say, recording artists, benefiting from past invested in developing them as a brand—as with the case of Sony versus George Michael, discussed by Kay, 1997.) While their mobility may depend upon their track records, which might seem conducive to promoting steady judgment about how bold to be when authorizing projects, it will shortly be argued that hiring creative staff with strong reputations could actually contribute to creative instability.

If perceived uncertainty about creative proposals cannot be resolved on the basis of the track records of those who champion them and/or the teams that will be called upon to implement them, then one way to deal consistently with creative proposals is via some kind of checklist system that uses established rules to classify projects into particular risk categories and set budgetary limits for what the organization is prepared to risk on projects that fall into particular categories. This is pretty much the approach to the allocation of R&D funds envisaged by Kay (1979) for large corporations that divide up budgets in a top-down manner based on rules honed over years of experience. However, it seems best suited organizations that each year have to allocate funds to large numbers of projects aimed at assuring a steady

stream of profits over the long term: some ‘blue-sky’, some less radical pure research, some development of recently pioneered concepts, some improvement of established technologies, with each category getting a budget. Such a system is redolent of the operations of research grant-awarding bodies in the tertiary education sector. But, as was noted in the paper’s introduction, Kay’s analysis is ill-suited to characterizing decision-making about creative projects that are on a substantial scale relative to the firm’s resources and which may ‘make or break’ the firm or at the very least change its fortunes drastically for the short to medium term. Kay’s view may fit rather well the case of, say, a large company in the pharmaceuticals sector but it sits uneasily with lumpy projects such as a new generation of airliner or jet engine, the development of the revolutionary float-glass process by Pilkington, or Ford Europe’s decision in the early 1980s to replace its successful but thoroughly conventional Cortina with the ‘jelly mould’ Sierra that turned out to be too radical to enjoy its predecessor’s sales.

In the rest of this section we will argue that that methods firms are driven to use to cope with these singular kinds of creative choices put them at risk of signing off proposals that will overshoot what their organizations can handle safely in technical and/or financial terms or overshoot what is acceptable to their customers. The mechanisms that we identify have similarities with those that are central to Minsky’s financial instability hypothesis (FIH), and it is to this that we allude in our notion of a creative instability hypothesis (CIH). Creative instability may itself affect financial instability: creative overshooting that is accompanied by moves along the risk spectrum from innocuous or potentially embarrassing investment strategies towards those that are potentially toxic may result in financial problems for shareholders and creditors, possibly triggering further defaults.

In Minsky's FIH, increasingly risky movements from hedge financing through speculative financing towards Ponzi financing are the result of some investment strategies being seen to be conspicuously successful and being copied by others as the path to riches. Capital gains on the favoured assets make them yet more attractive even in the face of declining ratios of income to asset value. Those with wealth and/or the capacity to borrow increase their gearing ratios in order to purchase the favoured assets before their prices rise yet further. Euphoric moods begin to emerge: the 'sky seems to be the limit' because attention is focused on capital gains rather than on the income flows the assets are realistically able to generate. If the capital gains fail to materialize, for whatever reason, the market will implode, as with the US property market bubble leading up to the 2007–8 Global Financial Crisis. The scale of the bubble, and the consequent fallout are prone to be magnified by opportunistic behaviour involving investors being duped in their eagerness to get on the bandwagon.

In the CIH, likewise, we see potential for creative agents to push the boundaries of what has previously seemed successful whilst losing sight of possible limits to the continuation of such trends. One way for firms to deal with uncertainty surrounding major creative proposals is by extrapolating from what has been successful recently, to see what might be feasible at a particular price (as with the learning curve concept for predicting costs) or acceptable to customers in future. Another way is to poach from rival organizations their star creative performers and then heed their recommendations about the creative direction to take—much as record companies bid for superstar recording artists on the presumption that their track records and brand presence provide a much more reliable route to profits than unknown newcomers offer (Rosen, 1981). However, neither of these strategies is

logically conducive to the organization achieving a steady developmental trajectory. Both are beset by the fallacy of induction and the risk of regression towards the mean: there are no guarantees that someone with a strong creative track record will continue to come up with ideas that work or that sharply diminishing or negative returns will not be encountered as a concept is pushed further and further.

An obvious example of creativity going ‘over the top’ is the fad for higher and higher tail fins and longer and lower bodies on automobiles in the US in the 1950s: the attempts of Harley Earl, the first chief stylist at General Motors, to make cars look increasingly like jet aircraft was initially successful but ultimately was carried beyond what the motoring public could be induced to regard as acceptable rather than ludicrous and dysfunctional. As Earl’s biography Stephen Bayley (1983, p. 123) points out, by 1960 the lowness of cars was becoming a problem for customers because it made dignified entry and exit increasingly difficult. This styling bubble burst, much like a Minskian stock market bubble and design switched to a more upright and practical approach.

The risk of creative overshooting in the areas of design and style, if not engineering, is increased by the fact that creative agents in firms are battling not merely against their counterparts in rival organizations but also with the creativity of fashion-leading consumers who pioneer new consumption connections (Holbrook, 1995, chapter 10; Chai, Earl and Potts, 2007). Those who want to remain fashion leaders have to keep making different connections from the mass of the population. Once a trend become established, the followers may feel they can start to chase the tails of the leaders by also extrapolating where things are going, and this bandwagon effect may thus give designers and stylists confidence to push beyond what they have previously offered within the current genre. Once this happens, the fashion leaders

can only assert their leadership by bucking the trend and making an abrupt change of direction to something very different rather than signalling that they believe a trend has been pushed too far merely by backtracking within the same genre. Unless firms can reliably sense when fashion leaders will make these abrupt changes, they are inherently likely to overshoot what the market will accept in their creativity in particular design or stylistic trajectories. Chances of anticipating when fashion leaders will signal a new direction are limited where firms have to take their creative decisions months or even several years before their finished products are offered to consumers, for the fashion leaders can switch to rivals at any time they like.

Buying in superstars in theory might result in a kind of winner's curse that entailed the star capturing the rents that their work generated for the organization that hired them. However, returns to being a star may instead entail the organization becoming lax in setting boundaries for their star performers, with unwarranted euphoria setting in—both with the star performers (being treated as deity-like figures) and with other senior figures who saw them as making 'the sky the limit' for the organization because they removed past impediments to success and ceased to be key assets of rivals. Again, as per a Minskian financial bubble, euphoria and a lack of accountability could result in 'over the top' visions being followed without due caution being raised.

It is important to stress here that the overshooting problem may often be best viewed as arising due to the scale of the leap between past performance and the level the creative staff now attempt to achieve, rather than some absolute level of performance. Over the long term, performance standards envisaged by grand designers may be perfectly achievable, but their vision may run ahead of their organization's current capacity to deliver it. Similarly, customers may eventually be

perfectly willing to accept, and even come to regard as perfectly normal, designs that are far more radical than something that today they judge as too radical. For example, after several decades, Ford's jelly-mould Sierra looks decidedly bland compared with the edgy styling of the third generation of Mondeo products that succeeded it.

However, at the time of its launch it was seen as very radical despite Ford adopting the common strategy of making it seem less of a leap forward by first presenting an even more radical version (known at the time as the Probe), at motor shows.

Similarly, products in the arts and entertainment sector that were resisted by the majority as shocking at the time of their launch often seem remarkably tame by modern standards: Stravinsky's *Rite of Spring* caused a riot on its first performance in 1913 but had become 'kid's stuff' by 1940, with excerpts from it being included in Walt Disney's *Fantasia*. This is readily understood in terms of theories of how the brain works such as Hayek's (1952) prescient contribution, *The Sensory Order*. If the mind makes sense of the world by trying to find matches between incoming sensory information and established patterns of firing of neural connections, then something radical will be hard to fit until new templates have been developed by the repeated firing up of new sets of neural connections. In the meantime, the best match may be with an altogether different stored pattern—in the case of the Ford Sierra, 'a jelly mould' rather than 'a new Cortina'.

When past performances and external reference standards are used as bases for reaching decisions, there is no particular reason to expect a tendency towards a steady state rather than behaviour that cycles between boldness and conservatism. As the extent of creative boldness appears to change the performance of a firm, the balance of power between conservative and radical groups on bodies that authorise creative projects will also change. Creative success achieved by a firm or by its rivals will tend

to lead to even grander and more radical projects seeming less risky and winning approval, with a rise in the standing of their champions. Creative success by rivals may seem to imply that getting radical and/or ‘thinking big’ is a commercial imperative for getting ahead of them or, at the very least, to catch up with them.

Overshooting will cause credibility problems for those who advocated the projects in question, but if conservative strategies result in a firm falling behind its bolder rivals, we should expect defections from conservative to radical camps. Those who ‘went too far’ (or whose conservatism was discredited) may even quit or be fired and be replaced by executives with less radical (more radical) agenda and/or reputations. While a focus on cost-cutting and offering products that offend no one may restore profits after an episode of overshooting, sooner or later there will be signs that being more radical does pay, as some rivals succeed with experiments aimed at satisfying what Scitovsky (1981) called ‘the desire for excitement in modern society’: there are limits to the amount of novelty a consumer can tolerate at any moment, but once consumers have got used to past novelties, they will be prepared to step once again some way out of their comfort zones to relieve boredom.

6. Alternative creativity trajectories

The creative instability hypothesis is not a general theory of the determinants of creative boldness in organizations. Though it is based on the idea that rival organizations take their cues from each other about how bold they should be, we are not claiming that all organizations fail to achieve broadly stable creative trajectories, any more than Minsky claims that all investors and financial institutions get sucked into euphoric over-gearing and end up bankrupt. Rather, what we are offering is a mechanism (in the sense of the term in social science advocated by Elster, 1999,

chapter 1) that offers a way of making sense of why some firms oscillate between grand designs and ‘bean counting’. When there is no obvious way of remaining profitable in a world of Schumpeterian competition we should not expect all firms to succumb to the processes suggested in the previous section. We have presented the firm as suffering from something akin to a bi-polar manic-depressive disorder but many firms may opt for more consistently rational kinds of strategies that reflect the kinds of deep-seated corporate cultures emphasized in the work of Selznick (1957).

In the automotive sector, for example, Ford’s European operations over the past half century have oscillated in a manner consistent with the CIH, as has Mazda in Japan, but other firms in this sector have wrestled with the creativity dilemma rather differently:

- The coolly composed industry leader that consistently pushes the envelope in some areas in a financially successful manner, essentially pioneering new technological modules within the context of a product that is otherwise conservative, using premium margins to finance high development spending on successive innovations. This is broadly the strategy of Mercedes-Benz over many decades.
- The ‘middle of the road’ strategy, with a steady trajectory of product development that entails neither extreme conservatism nor doing anything bold so long as the external environment does not change radically. This is broadly what Toyota seemed to be doing prior to the dawn of climate change awareness that resulted in its major commitment to hybrid power systems and radical small cars such as its IQ model.

- The rather timid innovator that periodically ‘sticks its neck out’ to try to overtake firms that pursue the ‘middle of the road’ strategy and then withdraws somewhat to consolidate its positions. Nissan and Honda rather fits this model, mostly offering products that evolve conservatively but occasionally coming up with strange products and adventurous styling rather than trying to foist on mass-market consumers the kinds of products they might be expected to deliver given the kind of high-end sports cars they have shown they can make.
- The punctuated equilibrium approach (cf. Miller, 1982; Earl, 1984, chapter 5; and Gersick, 1991) in which the firm operates rather as a scientific discipline in Kuhn’s (1962) analysis of the growth of knowledge. Most of the time its creativity involves merely incremental change within a particular framework that initially is very success, until more radical strategies of rival cause its performance to decline, whereupon the firm’s ‘corporate imagination’ comes up with a radically different replacement product that is then developed incrementally over many years until it, too, falls behind. In the automotive sector perhaps Volkswagen illustrates this most obviously, with its Beetle era of air-cooled rear-wheel-drive vehicles belatedly giving way to the water-cooled front wheel drive Golf in the mid 1970s, a car that set a new benchmark for small cars and which remained the product to beat as it evolved through six generations over the next 35 years. With the Golf’s market-leading status being toppled neither by more radical designs nor by conservative products that are cheaper but cannot match it for quality, there has been no obvious reason for Volkswagen to depart from their evolutionary strategy.

Though this typology was inspired by reflections on patterns of innovation in the automotive sector, we expect it to have a more general applicability. If so, economists should consider adopting a more pluralistic approach to the firm, for such a finding would be in line with the view of Loasby (1967. P. 167) that ‘All firms do not behave in the same way in the same circumstances and a theory which helps to explain why they do not is perhaps to be preferred to one which asserts that they should’.

7. Conclusion

Just as Schumpeter rejected equilibrium tendencies in markets, so in this paper we have attempted to show that economists would be unwise to presume that firms generally will display consistent approaches to how far they will push the creative envelope and how far they will focus on remaining competitive by increasing their productivity. Some may display consistency in this respect but there are good reasons, associated with uncertainty and internal corporate politics, to expect that firms will fail to display steady state trajectories in this respect. To the extent that firms are using external reference standards to judge how bold they may need to be in order to stay competitive, swings in boldness should also be expected at the level of the industry rather than merely in some firms. The pace and form of Schumpeterian creative destruction may thus be cyclical. To the extent that there is an interplay between the mood of the financial sector and the rest of the economy as regards the payoffs to being bold in what one does, then creative instability and financial instability will be intertwined.

The paper’s emphasis on overshooting—initially in creativity and then in a focus on costs—should not be taken to imply that we are arguing that economic

wellbeing would be enhanced if firms generally achieved steadier development trajectories. From an evolutionary standpoint, creative excess that results in poor returns to shareholders or even bankruptcy may nonetheless have benefits to the economy as a whole. Allowing grand designs to proceed provides useful information about the boundaries of what can be achieved, or where the limits of acceptance lie, that would not be uncovered by more tentative strategies. Hence other players can learn how to be more radical than they might otherwise have been, as well as incorporating technical insights that were achieved by allowing creative staff in other organizations to play at what they specialize in doing, untethered from the accountants' leashes. It is a messier process than one of equilibrium growth but it may ultimately result in both better products and lower costs than would otherwise have been possible (see also Potts, 2004).

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