Imposing separation to deal with a monopolist with a propensity for downstream discrimination.

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1. Introduction

Many value chains consist of activities with different levels of scale or other effects for the incumbent, and hence of problems of replicability for competitors. This leads to the risk that one firm may dominate the least replicable activity and leverage that position of dominance to aggrandise its market power in upstream or downstream activities. It can do so by denying its competitors access to the monopoly service, or by offering it at a price or in a degraded form which eliminates or weakens competitors in the downstream market.

Google's superdominance in the supply of Internet search activity places it in a position of such power. Internet search activity is generally recognised to exhibit significant scale effects; the company already enjoys a virtual monopoly of organic search and correspondingly of search advertising in most Member States; and there are considerable evidence-based complaints that the behaviour described above has been practised - in particular, evidence of discrimination against rival vertical search companies and potential bias in the allocation of advertising slots bid for by competitors to Google's downstream operations.

This is not a new problem, and the type of economic activity which has the most intense recent experience in dealing with it is found in numerous network industries, where the locus of monopoly power is often a distribution network. It can be a physical network, such as a water distribution network or a payment network or a wireless communications network; or a non-physical (or even a 'virtual') network

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such as a platform utilised by a community of users and application designers. The common feature is a core monopoly activity and, associated with or based upon it, ‘competitive’ upstream or downstream activities in which the core monopolist itself participates.

If the core monopolist exercises restraint, this need not be a problem. Consider the case of Intel in the 1990s. Intel enjoyed a strong or even a dominant position in the manufacture of CPUs for personal computers, and worked closely with Microsoft in enabling the development of higher speed processors. It also collaborated with other firms in developing and manufacturing complementary products, where it lacked in-house expertise or recognised that other firms had superior products. However, given the strength of Intel's position in the processor and related markets, ‘smaller' collaborators ran the risk that Intel might choose to make rather than buy. Such a perception could damage Intel’s long-term interests by stifling innovation incentives for smaller collaborators.

To resolve the investment incentives issue, Intel used the rhetorical and practical device of distinguishing two Jobs which the company performs: Job 1 - the task of expanding demand for the microprocessor, and Job 2 - the task of growing profitable businesses in complementary markets.[2] Intel sought to reconcile conflicts between the two Jobs over the period 1990-2004 by signalling that it would not subsidise its own entry into complementary markets by driving prices down, and did so by creating separate divisions for Job 2, with profit and loss responsibility. It also committed to not making too much money in these markets by actively giving away intellectual property and subsidising rival entrants. These commitments left it still able to intervene in those areas where it had a large comparative advantage.

Not all monopolists find it economically advantageous to behave in this sophisticated fashion. More commonly, the monopolist behaves more rapaciously in the upstream and downstream activities. How should a competition authority react in such cases? The obvious method is by deterrence of discriminatory behaviour. But this may not work. The

[2] Gawer A. & Henderson R. ‘Platform owner entry and innovation in complementary markets: evidence from Intel', *Journal of Economics and Management Strategy*, 16, 2007, pp. 1-24.

monopolist may bank on its ability to avoid detection or to wear down the authority's will to enforce. In the case of such persistent or recidivistic wrong-doing, a structural remedy may be required. One such remedy involves a form of vertical separation. In Google's case this would involve separating its monopoly activity – search and (possibly) the sale of search advertising – from its more contestable activities, including those which rely on the core activities. The goal is to remove the means and/or the motive to engage in discrimination. Separation can take a variety of forms, ranging from full ownership separation (divestiture) to less intrusive and more easily reversible variants. These are described below.

Structural remedies can only be used in antitrust cases where there is no equally effective behavioural remedy or where such behavioural remedy would be more burdensome for companies. There therefore needs to be some kind of benchmarking or comparative exercise designed and implemented to draw out the relative costs and benefits of behavioural as opposed to structural remedies. The paper concludes that separation is a viable and natural method for dealing with part of the Google problem.

However, structural remedies are only directed at stopping the contagion of monopoly spreading into adjacent activities. The equally important question of how the core monopoly came into being and how it might be reversed also needs to be addressed. That is the subject for a separate inquiry. However, the two issues of preventing the monopoly spreading and of rolling it back are linked. When considering variants of separation which are designed to prevent the leveraging of monopoly power, it is useful to ask whether they will also promote the goal of rolling back the core monopoly and restoring effective competition.

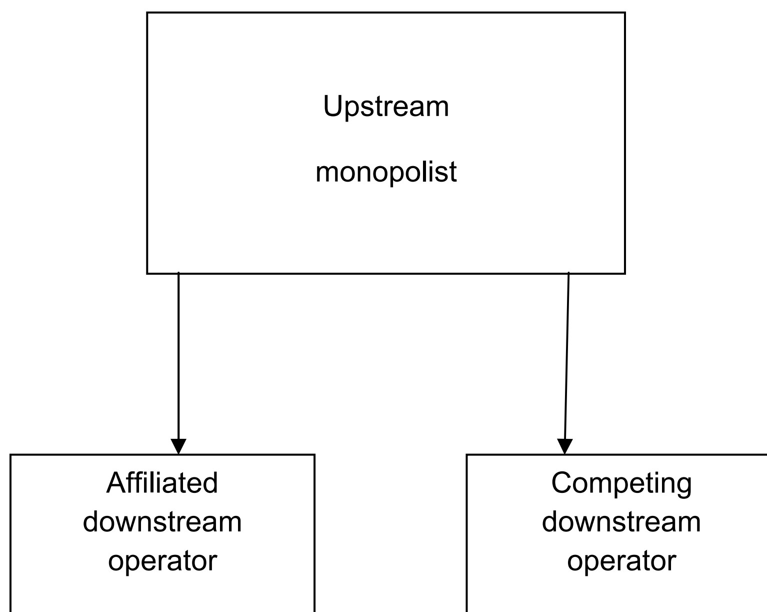
The rest of the paper is organised as follows: section 2 sets out the problem and describes why the monopolist might want to discriminate against downstream competitors, and section 3 summarises the pros and cons of separation in general. Section 4 outlines separation variants, and section 5 gives a European case study of separation achieved under competition law. Section 6 considers in more detail

separation options in relation to Google, and their likely effects. Section 7 contains a summary and conclusions.

2. Why discriminate?

The basic structure of the problem of dealing with a monopoly in a value chain is illustrated in Figure 1. There are two activities, of which one is a monopoly and the other competitive. The monopolist is active both upstream and downstream; the competitor operates only downstream, relying on the monopolist's upstream input. What might the monopolist do to thwart the competitor, and why would it want to do it?

Figure 1. The vertical structure under review.



The means of thwarting competition include foreclosure of the competitor by denying it access to the upstream input. This is rather 'obvious', but even delay in providing access (or uncertainty caused by lack of information or fear of arbitrary punishment) may be enough to give the monopolist a major 'first mover' advantage in downstream markets. Alternatively (or subsequently, under regulatory or antitrust pressure to supply), the monopolist may set a high price on access to its

monopolised input, preventing entry or weakening and, in the limit, driving out competitors. An extreme case of this is a full blown margin squeeze.

But this behaviour may be effectively deterred by competition law authority or made impossible as a result of price control by a regulator. A third line of defence is thus to offer the competitor the service but at a degraded level of quality – employing non-price discrimination. This may be both effective and hard to detect. For example, an incumbent telecommunications operator supplying local loops to its competitors may not repair those loops if they break down with the same alacrity with which it repairs the loops of their own retail customers; but this may not be immediately obvious.

Why would a monopolist bother to get involved in downstream markets? There are various schools of thought on this issue. Where no market power is involved, decisions whether to integrate are likely to be driven by efficiency considerations. This conclusion is extended to the case of a long term unregulated monopolist, which is capable of extracting maximum rents from its control of that monopoly. Since it 'can only make the monopoly profit once', its decision whether or not to enter into the downstream market will be based on efficiency considerations alone.

However, even absent regulation, the monopolist may have other reasons to leverage its market power into a vertically related activity. One possibility is that it may fear that its core monopoly is vulnerable, and either seek to buttress it, or look for a successor source of income, by expanding its market power in a downstream market. Thus in the present case, a company such as Google might fear that vertical search engines might become rival attractions for advertisers and rival repositories for the data required to offer high quality search results.

Another significant concern may be that a successful downstream competitor might use that market as a base to attack the monopoly itself. These concerns are likely to arise in complex sectors characterised by production processes in which significant shifts in value might occur across the various components of the value chain. All this makes it

predictable that the monopolist will leverage its market power more widely.

A different situation prevails if a regulator uses the control of prices expressly to prevent the making of monopoly profits upstream. On this assumption, the literature has identified three cumulative conditions under which the monopolist would practice 'sabotage', as the act of degrading competitors' input is known. These conditions are:[3]

1) the monopolist's price is driven down to average cost by the regulator;

2) the retail product market is homogeneous; and

3) the monopolist is no less efficient than other firms active in the downstream activity.

Our earlier illustrations have been taken from Intel and the world of traditional network industries, but it is useful to be more explicit over how Google might fit into this framework. In the Google exemplification the monopoly power resides in Google's search engine, a classic platform recognised as enjoying substantial (relative) scale economies.

These are derived from a number of sources, including: (a) network effects associated with the user base, whereby unwitting users reveal their preferences and behavioural patterns by using the network, and thereby improve the search results; (b) economies of scale in storage, data processing facilities and the like; and (c) the provision of a better service to advertisers, who can reach, say, 95% of their target audience by single-homing on Google.

The Google search engine has an output free at the point of use – the organic search results. As well as to the above-noted benefit in kind, in the form of information coming from users' searches, it receives a monetary reward in the form of sales revenue from search advertising. The company's market shares in both search and search advertising are enviably large and stable.

[3] Beard, T., Kaserman, R.D.I. &.Mayo, J.W. 'Regulation, vertical integration and sabotage'. *Journal of industrial Economics,* 49(3) 2001, pp. 319-333.

Downstream there lies a set of competitive activities which depend upon the search results. It includes, most obviously, vertical (more specialised) search engines for which users search on Google. Some of these, as illustrated in Figure 1, are provided by Google itself. These businesses compete for a place high up on Google's search rankings, and they also compete to buy well placed positions in Google's paid advertisements on the right of the screen.

This situation leaves Google in a position in which it is able: (a) to ensure that products rivalling those of Googleappear lower down on the organic search results. It may also (b) distort the prices at which paid search is available to products rivalling Google's own; and (c) degrade the impact of competitors' paid search by placing it in an unfavourable location.

It should be noted that while Google search is the core monopoly activity, Google search advertising is a line of business which is more easily contested by other types of search engine. It is therefore an open question whether paid advertising should be put in the same 'monopoly' box and subject to the same remedies as Google search. This issue is discussed further below.

Competitive services actually or potentially subject to discriminatory treatment in a similar fashion as a result of their reliance on or association with Google's search engine include: online publishers; providers of mapping and related services; providers of local content; and any user of Google's Adwords platform.

There are a number of possible remedies to this problem. This paper focuses on one which is particularly effective - the remedy of separating the monopoly from the competitive activity in some manner. Structural solutions to antitrust problems have been increasingly relied upon since 2003 under the European Commission's antitrust procedures and provide a particularly useful benchmark against which to consider the effectiveness of behavioural remedies.

Before considering the remedy in further detail, it is useful briefly to review the basic economics of integration and separation.

3. The pros and cons of separation in general

Initially, it is worth making some preliminary general remarks about separation, which rely on a valuable survey article by Lafontaine and Slade.[4] We begin with three of their accounts of rationales influencing the integration/separation decision, based respectively on: (a) the problem of shirking in large organisations (moral hazard); (b) the extra costs incurred with trading across firm boundaries rather than making internal, hierarchical, decisions (transactions costs); and (c) the enhancement of market power.

It is important to note that the form of separation contemplated in the author's account is full ownership (structural) separation: the half-way houses noted below which are familiar to students of network industries do not feature in the broad-ranging review.

The central issue in the moral hazard account is the limitation of shirking by employees of the parties. Separation generally yields higher-powered incentives, because the units to which they apply are smaller. (This benefit can partly be replicated without separation by greater monitoring of effort.) But separation also imposes greater risks, because it removes the insurance associated with belonging to a more diversified organisation.

The transactions cost model encompasses costs of all kinds, including those that are known somewhat anachronistically as 'ink costs', predominantly accruing to lawyers, for drawing up contracts between (separated) independent parties which would not be required in an integrated firm operating as a hierarchy. But an economically more interesting illustration of such costs is the so-called 'hold-up problem', arising when one of two vertically separated firms is contemplating a relation-specific investment. That firm is concerned that, once it has sunk its investment, its partner will seek to drive the price of the products

[4] Lafontaine, F. & Slade, M. 'Vertical integration and firm boundaries: the evidence', *Journal of Economic Literature*, 45 (2007) pp.629-685.

it buys from the investor down to the level of avoidable costs, by the threat of purchasing elsewhere. Accordingly, the first company, anticipating this outcome, will not make the investment. In the alternative integrated regime, the problem is resolved within the hierarchy of the firm.[5] Such problems can be resolved contractually, by such arrangements as long-term contracting with adjustment clauses, 'take or pay' agreements, *etc*., but this approach does not always work.

In the market power account, integration allows a firm to leverage its dominance in one part of the value chain into a vertically related one. This is the focus of the present paper.

Lafontaine and Slade examine over 200 empirical studies dealing with the motivation or the consequences of the integration decision adopted. In relation to consequences, their view is generally favourable to integration.

A similar literature review by Joskow[6] concluded that:

> "*This suggests that there is little empirical support for antitrust law's traditional suspicion of and hostility toward vertical integration and related non-standard vertical contractual relationships except under extreme circumstances where firms controlling bottlenecks have the incentive and the ability to exercise an anticompetitive foreclosure strategy.*"

It is notable that Lafontaine and Slade do find evidence of anti-competitive conduct in a number of the studies which they analyse.[7] It is also the case that Joskow, in his review of electricity market liberalisation, comes down firmly against the "*vertical integration between transmission and generation that creates the incentive and opportunity for exclusionary behaviour*".[8]

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[5] The history of this argument in favour of integration is muddied by the fact that its canonical example, the vertical merger in the 1920s between General Motors and Fisher Bodies, making car bodies, which had been widely attributed to the hold-up problem, turned out on closer inspection of the record to be the result of quite different forces; see Coase R.H., 'The conduct of economics, the example of Fisher Body and General Motors', *Journal of Economics and Management Strategy*, 15 (2006) pp. 255-278.

[6] Joskow P. 'Vertical integration,' *Antitrust Bulletin*, 55(3) 2010, p. 22.

[7] Such as double marginalisation and strategic delegation, in which upstream suppliers can soften competition by delegating pricing decisions to independent retailers; *op. cit*. in *fn*. 4, pp. 665-6, 672-3.

[8] Joskow P. 'Lessons learned from electricity market liberalisation.' *The Energy Journal*, 29(2), 2008, p. 22.

This suggests that vertical ownership separation, or equivalently the prohibition of vertical mergers, is not a policy or a remedy to be adopted lightly. It may, however, be possible to combine some of the advantages of separation and of integration by means of alternative interventions. These are considered in the next section.

4. Different forms of separation

In the studies reviewed by Joskow and by Lafontaine and Slade, the two options considered are ownership separation and ownership integration. But there are other options. The key ones are shown in Figure 2.[9]

Figure 2 . Separation options.

Ownership

Legal

Functional

Virtual

Accounting

To take each of these variants in turn, starting from the least intrusive, *accounting separation* notionally splits a business into separate components each with its own profit and loss statements and balance sheets, based on trade with one another (at transfer prices) and others at actual prices. This is a useful means of showing where the money is being made, and it can be applied to a business which is, managerially, highly integrated. At the very least, this option allows antitrust regulators to better understand revenue flows so that the logic behind strategic market behaviour is better understood.

[9] See Cave M. 'Six degrees of separation: operational separation as a remedy in European telecommunications regulation', *Communications and Strategies*, 64(4) 2006, 1-15.

The next variant to consider is *virtual separation*. This refers to the imposition by the regulator of an obligation to achieve broad equivalence in the services offered to internal and external customers, without any physical separation of operations, IT systems, business premises, *etc*. It permits different treatment of the two groups of customers, providing that they are placed in broadly the same position. Virtual separation is likely to be much less costly than more comprehensive 'physical' separation.

The key question here is whether the necessary broad equivalence will be achieved, or be perceived to be achieved by competitors. Both reality and perception are important since a lack of trust in the arrangements will deter investments by competitors almost as severely as actual discrimination. This is especially the case since, in Google's circumstances, the discrimination in question is likely to involve non-price elements and other complex issues. Competitors' perceptions of Google's likely behaviour will be affected by its track record of adherence or non-adherence to regulatory norms such as those concerning data protection and privacy or retaliation.[10]

The next step up, *functional or operational separation*, involves physical business separation, and a reworking of underlying business practices to create an identical transaction boundary with affiliated and competitive customers. The aim is to segregate particular activities within a separate unit, which then interacts using identical processes with both internal and external customers in way that can be verified transparently.

However, the separation process is not complete; otherwise, we would be observing something equivalent to full ownership separation. Instead, the functional separation of activities, and of physical and intellectual assets, can be imposed in different ways. For example, with respect to premises, staff can readily be physically separated in different offices or combined. Separate units can have different internal labour markets – *i.e.*, with no movement between them, or they can be integrated. Separation of labour can be reinforced by having different bonus pools. IT and management information systems can be separate or integrated.

[10] In this respect, I understand that issues of a similar kind are reflected in a recent Judgment: Case C-457/10 *AstraZeneca AB and AstraZeneca plc v European Commission*, Judgment of 6 December 2012 [not yet reported].

The more separation there is, the more likely it is that competitors will trust the arrangements adopted.

This degree of separation could be extended to legal separation, a regime in which a separate board is created and separate statutory accounts are filed - all designed to emphasise and support the independence of the separated entity. These options represent the highest degrees of functional separation listed above.

Finally, ownership separation eliminates this crucial aspect of common ownership, and hence any conflict of interest in a vertical setting. The monopolist has no reason to discriminate among the various downstream firms.

Before evaluating the applicability to Google of the separation alternatives listed here, it is worth briefly looking at a worked example of separation accomplished under competition law. The market concerned is quite different from the market for Internet search, and the market share of the dominant firm is considerably less than that of Google in internet search in Europe; but it may be possible to draw out some lessons for the present case.

5. A worked example.

In 2006, the UK telecommunications operator BT gave commitments under the UK's competition law (the Enterprise Act 2002), under which it would functionally separate its 'local loop', which connects homes and business premises to its local exchanges, at that time by a copper loop, now by copper and a slowly increasing proportion of fibre.[11] Acceptance of these proferred commitments prevented a possible reference under the Act to the Competition Commission, which has the power to require the divestiture of assets. In essence, BT agreed to re-engineer its business processes in the manner of Figure 4 above, thereby placing BT's own retail business and retail competitors in exactly equivalent conditions with respect to their access to local loop facilities.

[11] For more details see. Cadman, R. 'Means not ends: deterring discrimination through equivalence and functional separation. *Telecommunications Policy*, 34(7), 2010 pp. 366-374.

In more detail, it undertook to:

-establish an operationally separated access services divisions (subsequently named “Openreach”), located on separate premises;
-ensure full equivalence for key access products by agreed dates; and
-establish an Equality of Access Board (EAB) to police the undertakings.

The role of the EAB, which had BT executive and independent members, including a former regulator, was to police the commitments in a transparent way. No legal separation was imposed.

Openreach managers were given discretion over a specified investment budget, which they had to spend by taking decisions on the merits for Openreach alone. In other words, they could not treat as benefits those extra revenues resulting from the investments which accrued to other parts of the business.[12]

However, some investments, including those in fibre networks, went beyond the scope of Openreach alone. Accordingly, these were taken at Group level. In other words, while operating decisions were separated, major investment decisions were integrated. The hold-up problem was thus eliminated or mitigated.

The overall impact of the intervention is hard to quantify, since it was introduced as part of a package of policy measures. However, in the ensuing few years, competitors displayed a much higher level of purchases of the monopoly services offered by BT, and quickly captured the lion’s share of the retail broadband market.[13]

Although BT’s functional separation was accomplished under competition law, in 2009 the European Directives on electronic communications services were revised to include functional separation

[12] Martin Cave*, Separation and investment in telecommunications networks*, mimeo 2008, p. 18.
[13] O*p. cit*. in fn.11, pp. 370-2.

as an ex ante remedy which can be employed in the face of persistent discrimination which cannot be checked by other means.[14]

6. Application to Google Internet search.

How does the above discussion impinge on the Google case? My analysis has been predicated on the hypothesis: (i) that Google search is *de facto* a persistent (but not a 'natural', nor necessarily an immortal) network monopoly; and (ii) that there is evidence that the firm has a tendency to practise price or non-price discrimination *vis-à-vis* its downstream competitors. In respect of some of these competitors, intervention may be a case of shutting the proverbial stable door after the horse has bolted, because they have already been eliminated from or substantially weakened within the marketplace; but that is no reason to refrain from intervention.

As noted above, one mode of intervention is to separate monopoly and competitive elements in order to prevent discrimination. There are several variants of separation which play a role here, notably, functional and ownership separation. The latter involves a clean structural break; the former is associated with a large number of design choices. Ownership separation is much harder to reverse, whereas with functional separation, the intervention can be rescinded and (at a cost) reversed if it no longer serves any purpose.

To help fix ideas, consider two possibilities. One form of separation would involve divesting the Google search business, and possibly search advertising, to a separate company which is precluded for the time being from participating in upstream and downstream non-search activities. Save for monitoring the prohibition on cross-ownership, this would not require continuing enforcement, but the costs of divesting one part of the business would be incurred.

[14] DIRECTIVE 2009/140/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services, Article 2,10).

The alternative option of functional separation would translate Google search and, possibly, search advertising into a separate division in the Group. Under the rules of functional separation, it would have a uniform *modus operandi* with downstream businesses irrespective of whether they were co-owned within the Group or separately owned. This would apply to all current operations and, importantly, to the sharing of information about future plans. Investment decisions would be taken, depending on their scale, by the Google search division or at the Group level. The Group board would still be able to make major capital allocation decisions, on the basis of its overall strategy.

An effective enforcement mechanism, possibly involving an independent monitoring or audit board, would be put in place to supervise the non-discrimination obligation.

A key supporting measure of functional separation is to link the compensation of managers of the separated business to its performance alone, and to decouple their rewards from performance of the company as a whole. Without this, the group of managers in question has a vested interest in continuation of the discriminatory practices. In effect, this rules out stock-based compensation for employees of the separated business. Unless such a decoupling can be achieved, the balance swings strongly in favour of ownership separation.

The arrangements would be subject to review or sun-setting by the European Commission at pre-determined intervals. Google would also be able to petition the Commission for changes in the arrangements, for example, over the location of the functional separation boundary. If market conditions changed sufficiently, the obligations could be withdrawn.

It would also be desirable to put accounting separation in place to introduce more transparency and, in particular, to disclose (but not necessarily prohibit) cross-subsidisation from the ‘separated’ activities to other Google activities.

As noted above, it is possible to separate either Google search alone, or Google search and Google search advertising together. This question is one which often arises in respect of a separation proposal, where

different views can be taken of the where the boundary will lie in the future between monopolistic and competitive or contestable activities.

At present Google's market power and market share in search advertising are as great as its market power and share in search. Suppose that separation of search eliminates discrimination against downstream competitive activities as described above. The effect will be to challenge Google's dominance of search advertising activity. The question is: will this effect be strong enough to counteract discriminatory behaviour on Google's part in an unseparated search advertising market? This is a question which it is difficult to answer without further study. The policy adopted will also depend on the form of separation contemplated, since functional separation is more readily reversible than ownership separation.

Table 1. A comparison of functional and ownership separation

	Functional	***Ownership***
Reversibility or variation of the point of separation	*can be reversed*	*not reversible*
Reversibility of the intervention	*can be reversed*	*not reversible*
Costs of implementation	*continuing supervision*	*one-off break-up costs*
Extent of supervision of remedy	*significant*	*zero*
Loss of synergies	*potentially difficult to forecast*	*complete*
Impact on dynamic efficiency	*limited*	*possibly larger*
Impact on sustainability of the core monopoly	*potentially difficult to forecast*	*probably larger*
Would the separation be credible to competitors?	*potentially difficult to forecast*	*yes*

Table 1 contains a comparison of the two variants. Many of the entries require little explanation. I focus here on those which are difficult to forecast.

To be successful, a remedy of this kind must command enough confidence from competitors to allow them to invest in competitive markets. This is as much a matter of perception as of what actually happens, and an unscrupulous firm has an interest in not promoting such confidence. In order to anticipate Google's likely future conduct under a system of functional separation, competitors will look at the company's record of breaching regulations in the past. Unfortunately, this demonstrates substantial and varied infractions, especially in the area of privacy and data protection.

In these circumstances, the Commission would have to establish watertight procedures to prevent the (anticipation of) covert continuation of non-price discrimination. Or it might conclude that the problem was so acute as to rule out less the onerous option of functional separation.

A second key element is the impact on dynamic efficiency. The functionally separated Google search division would be able to communicate with downstream firms in the interests of innovation, save that it could not do so in such a way as to favour affiliated companies, just as an ownership-separated Google search company could, though it would be precluded from taking an interest in any downstream company. It is difficult precisely to compare the precise effect of these alternative arrangements on levels of innovation.

Third, to what degrees do the two remedies impact upon the sustainability of the search monopoly? As noted, my starting hypothesis is that Google's search monopoly is not the result of irresistible forces driving the activity to a 'natural monopoly' outcome.[15] Rather, it has resulted from a combination of scale benefits, network effects, and strategic decisions which have caused, or allowed, the market to tip in Google's favour. On this footing, an important aspect of any remedy is whether it assists in rolling back the monopoly.

In my view, it is more likely that maintaining Google search within a larger group would better insulate it from future attempts by rivals to undermine or replace its search monopoly. Accordingly, this consideration on its own is likely to operate in favour of ownership

[15] This distinguishes the present case from others, where the problem is plausibly one of a natural monopoly.

separation. The crafting of additional remedies designed to claw back the competitive dynamic that has already been lost to Google is a process that can be seen as being complementary to the process of separation, but which can and should also be judged on its own merits.

7. Summary and conclusions

This paper has argued that separation provides a proven and viable solution to the vertical leveraging problem which the combination of Google's structural position and behaviour has presented. It may seem incongruous to propose it in relation to a 'new economy' sector such as search, but the persistence of Google's monopoly and the centrality of search in contemporary economy and society confers a power once held by physical networks to exercise a broad dominance in the economy. Indeed, far from being incongruous, separation may provide the most robust and proportionate response to Google's particular practices, given the particular industry dynamic which characterises Internet search. At the very least, separation needs to be taken into account in assessing whether behavioural remedies are equally effective in remedying the problems identified.

Separation can take several forms, of which the most relevant here are functional and ownership separation. Each has its pros and cons, and the present paper does not favour one over the other. Reaching such a conclusion requires further work. It has been argued, however, that one important criterion should be the degree to which the remedy facilitates the parallel task of rolling back the core Google monopoly in Internet search. It will thus be important to take account of the possible complementary roles of separation in, firstly, preventing Google's market power in Internet search from spreading, and secondly, diminishing its extent.

In any event, structural separation is forward looking and seeks to address incentives to engage in unlawful leveraging. It should therefore be seen as complementary to remedies intended to address scale, particularly where that scale has been unlawfully obtained.