December 28, 2012


Robert G Harris, University of California - Berkeley

Available at: https://works.bepress.com/robert_g_harris/5/
“The Role of Switching Costs in the Markets for
PC Operating Systems, Online Search, Internet Access and Mobile Service:
Implications for Australian Competition and Consumer Protection Policy”

by
Dr. Robert G. Harris
Professor Emeritus, Business & Public Policy
Haas School of Business, University of California, Berkeley
and
Senior Consultant, Charles River Associates

presented to

“Competition in the Online Environment”
Melbourne Business School

28 November 2012

*The author is grateful to Google, Inc. for financial support of this research, and to Brian Chin for excellent research assistance. The opinions in this paper are my own.

**The author welcomes comments: rgharris@haas.berkeley.edu
# Table of Contents

A. Introduction ........................................................................................................................................ 3

B. The Economics of Switching Costs .................................................................................................... 5

1. Switching Costs and Competitive Analysis...................................................................................... 5

2. Types of Switching Costs .................................................................................................................. 6

C. High Switching Costs in PC Operating Systems and the Microsoft Browser Case............. 11

1. Switching Costs in PC Operating Systems by Type ....................................................................... 11

2. Switching Costs were Key to Showing Monopoly Power & Monopolization in Microsoft.. 13

D. Low Switching Costs in Internet Search .......................................................................................... 16

1. Switching Costs in Online Search by Type....................................................................................... 16

2. Evidence of Switching among Generalized Switching Engines (GSEs) ....................................... 18

3. Alternatives to Generalized Search Engines for Searching ............................................................ 22

4. Implications for Competition Policy ................................................................................................. 27

E. Switching Costs in Internet Access Services ................................................................................... 28

1. The Australian Market for Internet Access Services................................................................. 28

2. Switching Costs in Internet Access Services by Type .................................................................. 31

F. Switching Costs in Mobile Communications Services .................................................................. 33

1. The Australian Market for Mobile Communications Services .................................................... 33

2. Switching Costs in Mobile Services by Type ................................................................................ 35

G. Policies to Reduce Switching Costs or Alleviate their Effects......................................................... 37
A. **INTRODUCTION**

In the past several decades, we have experienced an unprecedented and rapidly accelerating pace of innovation, especially in computing, communications and information technologies (ICT). These technological advances have transformed economies and societies, through the development and rapid adoption of personal computers, the Internet, mobile devices and communications, and cloud computing. The smartphones and tablets of today are as powerful as the supercomputers of only 20 years ago.\(^1\) The amount of information readily available through the Internet and mobile devices vastly exceeds that of the greatest libraries on earth; more importantly, consumers can access that information quickly and easily through Web navigation, searching, mobile apps, voice commands or a host of other means.

It is self-evident that these technologies have had enormous impacts on competition, sometimes for better, sometimes not. The 30-year monopoly of Microsoft Windows—still the world’s dominant operating systems for personal computers—is finally being challenged by new operating systems for mobile devices, including Apple’s iOS and Google’s Android.\(^2\) Beyond the massive competitive effects within CCIT industries, these advancing technologies are transforming many other industries, as banking, retailing and many other services go “online.”

This paper will address one set of issues related to these developments: switching costs—the costs customers actually do or would incur from changing from supplier of a good or service to another. Due to both digital convergence\(^3\) and divergence,\(^4\) and the growing importance of CCIT to economic performance and consumer welfare, switching costs (and closely related network effects) play an increasingly important role in competitive analysis and competition policy. This paper considers the interplay of switching costs and the emergence of the digital, online economy.

Section B summarizes the economics of switching costs and distinguishes the main types of switching costs, including: compatibility costs (and their relationship to network effects), contractual costs, transactions costs, search costs, learning costs, uncertainty costs and shopping costs. It provides illustrations of each type of switching cost and explains interdependencies across types. It explains the fundamental difference between “inherent” switching costs, those that occur naturally in any given market, and “strategic” switching costs, which are created or elevated by a competitor (or group of competitors) to reduce the incidence of switching. For the purposes of competition policy, it

---


\(^2\) “by the end of Q2 2013... the global smartphone plus tablet installed base will surpass the installed base of the PC.” http://techcrunch.com/2012/11/05/mary-meeker-internet-trends/

\(^3\) Digital convergence refers to the growing use of Internet protocols for transmitting data, whether that data represents text, audio, images or videos.

\(^4\) Digital divergence refers to the proliferation of different types of digital devices for creating, storing, processing or exchanging digital information, including personal computers, tablets, smartphones, Internet-enabled televisions, etc.
explains why there is a critical difference between cases in which there is sufficient ex ante competition among suppliers from those in which there is not.

The next four sections address switching costs and their implications in four markets. Section C examines the case of PC operating systems, in which switching costs were so high as to create a near-absolute “lock-in effect,” and there was insufficient ex ante competition to offset that lock-in.\(^5\) In PC operating systems, the compatibility and network effects were so great that Microsoft effectively won the battle for the market at a very early stage, which is to say that the PC operating system market exhibited “uni-homing.”\(^6\) Although this section considers PC-OS switching costs in its historical context, it notes that competitive concerns continue, as evidenced by Microsoft’s use of Windows 8 to advantage its Internet Explorer vis a vis competing Web browsers.

Section D addresses the opposite end of the spectrum of switching costs, namely Internet search. Whereas the evidence shows that switching costs have been prohibitively high in PC operating systems, they are essentially zero in online search. Not only can search users readily and costlessly switch among the leading generalized search engines—Google, Bing or Yahoo—they can and do use a host of other, more specialized search engines to find information on the Web. They also use bookmarks to speed up direct navigation to the “favorite” websites, shopping sites such as Amazon, and mobile apps to search for information. Indeed, most consumers use a combination of these search methods, which is to say that search is “multi-homing.”\(^7\)

Sections E and F analyses two cases of intermediate switching costs, in Australian Internet access services and mobile communications services, respectively. These sections examine the sources of switching costs and how they are effecting developments in those markets, including switching costs related to contracts, shopping (bundling), and uncertainty. It will consider the extent to which these developments are likely to raise significant issues for competition and consumer protection policies and their enforcement.

Finally, Section G discusses methods of moderating the effects of switching by reducing switching costs or by increasing ex ante competition, such as improving information disclosure to consumers and the ability of consumers to factor switching costs into their choice of services or service providers.

\(^5\) For an extended discussion of the Microsoft case, as well as other U.S. antitrust cases in which switching costs played an important role, see Aaron Edlin and Robert G. Harris, “The Role of Switching Costs in Antitrust Analysis: The Case of Microsoft and Google,” forthcoming in Yale Journal of Law and Technology,” Spring 2013.

\(^6\) “Uni-homing” creates a “winner take all” in a market, which can become self-reinforcing, especially if the winner strategically uses or even increases switching costs to restrict competition and raise entry barriers.

\(^7\) “Multi-homing” refers to instances in which any number of competitors can succeed in a market, often using quite different approaches to generating economic value and even very different business models (e.g. free product searching on Google or Bing, supported by advertising revenues, versus free product searching on Amazon, supported by the sale of products).
B. **The Economics of Switching Costs**

1. **Switching Costs and Competitive Analysis**

Switching costs are caused by switching from one supplier of a particular good or service to another supplier, including money costs and the value of users’ time.\(^8\) Because switching costs sometimes inhibit consumers from switching from supplier A to supplier B, it is common for supplier B to implicitly or explicitly subsidize the cost of switching (e.g. by offering a substantial discount, or by providing free training to new users). “Lock-in” is defined as switching costs that are sufficiently high so that buyers stay with a current supplier rather than switch to a supplier whose product they consider to be preferable (i.e., the costs of switching suppliers exceed the benefits of switching). Although the term “lock-in” is often used in a more general sense where there are switching costs, but not so high as to substantially inhibit switching. Instead of “lock-in”, I will use the term “sticky” (or “stickiness”) to describe markets or services in which there are moderate switching costs.

Inherent switching costs are those that arise from the nature of the product(s) or the market in which they are sold. In contrast, strategic switching costs reflect choices made by firms designed to create switching costs or increase them above their inherent level. The distinction between inherent and strategic switching costs is fundamentally important to competition policy, particularly to a showing of monopolization or attempts to monopolize, but also to identifying which type of regulatory or policy intervention is warranted or best-suited to address problems arising from switching costs.

Although suppliers sometimes find it in their interest to increase switching costs, it is not always in their interest to do so, because consumers often prefer to buy products or services from suppliers where switching costs are low. Thus, some suppliers pursue strategies, often through de facto or de jure industry standards, that reduce switching costs to very low levels in order to expand the market by attracting customers with the knowledge that they can “mix-and-match” from various suppliers (a good example of which is audio-video systems).\(^9\) In these cases, firms are acting strategically to lower switching costs.

One of the most important developments in the history of switching costs is the Internet and the emergence of online commerce, often in competition with “brick-and-mortar” in retailing\(^10\) or the

---

\(^8\) Farrell, J., & Klepper, P. (2007). Coordination and lock-in: Competition with switching costs and network effects. In M. Armstrong & R. Porter (Eds.), *Handbook of Industrial Organization, Volume 3* pages 1971-1972. In many cases, the value of users’ time is the most important component of switching costs, for example, installing a different PC operating system, or converting from Office to an online productivity suite.

\(^9\) For example, a Sony TV can easily be paired with a Toshiba DVD player, which can then be combined with a Bose speaker system. Such devices are designed to work together with few, if any, incompatibilities.

\(^10\) There is growing evidence that, due to the low cost of search and shopping on the Internet, retail stores often function as “showrooms” in which customers compare products, but then use mobile devices to compare prices and purchase online. For a discussion of this trend, please see Heller, L. (2012, April 12, 2012). Best Buy Wants You to Stop Using Its Stores as Showrooms from http://dealnews.com/features/Best-Buy-Wants-You-to-Stop-Using-Its-Stores-as-Showrooms/566172.html
traditional means of distributing media content. The extraordinarily low costs of search or shopping on the Internet and the rise of online services have dramatically lowered search costs, shopping costs, and uncertainty costs.

2. **Types of Switching Costs**

Though there is no standardized categorization of switching costs, the following types of switching costs can be useful in analyzing competition in a market. In most markets, particular types of switching costs play a prominent role, whereas other types do not. In some cases, switching costs are tangible and relatively easy to measure (if not precisely quantify). Other switching costs may be more intangible and more difficult to observe, but still play a significant role in consumer choice and competition in the market. Buyers and sellers therefore take steps to increase or decrease switching costs for competitive purposes. For example, in the face of high switching costs, sellers often use introductory pricing to attract new customers, effectively paying some or all of the costs of switching.

**Compatibility Costs:** When there are complementary products, purchase decisions about one product can “lock” a consumer into purchasing follow-on products, or at least create costs of switching to an alternate supplier (“stickiness”). This situation can arise when consumers purchase durable products and consumable or replacement complements, such as computer printers and ink cartridges. Compatibility costs often play an important role in the computer industry, among hardware components (computer and printer) or between hardware and software.

Compatibility costs are often interconnected with network effects, meaning that adoption of a product by additional users is complementary and therefore the benefits of adoption by any single user increases as other consumers adopt. According to Farrell and Klemperer:

“Switching costs and network effects bind customers to vendors if products are incompatible, locking customers or even markets in to early choices. Lock-in hinders customers from changing suppliers in response to (predictable or unpredictable) changes in efficiency, and gives vendors lucrative ex post market power – over the same buyer in the case of switching costs (or brand loyalty), or over others with network effects.”

“Direct costs are incurred if consumers actually switch or actually adopt incompatible products. Consumers may avoid those costs by not switching, or by buying from the same firm, but that ties together transactions and thus often obstructs efficient buyer–seller

---

11 Contrast the high costs of switching between cable and satellite delivery of video programming versus the very low costs of using an existing broadband connection to switch among alternative sources of “over-the-top” delivery of video programming.


matching... These entry hurdles may be broadly efficient given incompatibility, but they nevertheless represent a social cost of incompatibility.”

Thus, strategic choices of compatibility or incompatibility by early entrants can shape the market (and complementary or vertically related markets) so it becomes difficult for others to choose a low switching cost approach, e.g. the strategic choice of incompatibility between/among complementary products (e.g. IBM’s choice of Intel and Windows for PCs, or Apple’s Mac OS). Such systems may be called “proprietary” or “closed.” For that reason, Klemperer argues that

“Because switching costs very often make competition, and especially entry, less effective, I (and many others) favour cautiously pro-compatibility public policy. Policymakers should look particularly carefully at markets where incompatibility is strategically chosen rather than inevitable.”

The same logic applies to the enforcement of competition policy: firms that strategically use incompatibility to raise switching costs should be subject to heightened scrutiny. Alternatively, firms may choose to compete by creating an ecosystem of many compatible products, increasing total demand by facilitating mix-and-matching components or applications across a wide range of sellers (e.g. audio systems, the Web). Such systems may be called “open” or “non-proprietary.” Firms may develop industry standards to facilitate compatibility and interoperability (e.g. “http” and “html” were crucial to the development of the Internet; 2G, 3G, LTE and WiFi have facilitated the phenomenal growth of wireless communications).

Firms may choose a set of strategies that combines both approaches. Apple has chosen to open the development of iPhone and iPad apps to independent, third-party developers, but Apple has chosen to close the distribution and sale of those apps to its own App Store and requires approval of the app prior to its sale. The net effect is that there are very high user switching costs from the Apple ecosystem to another ecosystem (e.g. Android) but very low/no switching costs within Apple ecosystem (e.g. one app to a similar app).

**Contractual Costs**: Suppliers often find it advantageous to raise switching costs that might otherwise have been low. Likewise, consumers may accept high switching costs in return for “upfront consideration,” reduced uncertainty or other benefits. To attract new or retain existing customers,


costs&topicid=&result_number=1

16 The use of industry standards to promote competition while achieving interoperability (e.g. mobile communications), creates a substantial lock-in effect if patentees whose claims are standards-essential extract economic rents by committing patent hold-up. See Farrell, J., Hayes, J., Shapiro, C., & Sullivan, T. (2007). Standard setting, patents, and hold-up. Antitrust Law Journal, 74, 603-670.

17 Some strategic choices may increase switching costs but have offsetting benefits to consumers (e.g. a higher degree of integration, interoperability and ease of use, as in Apple iPhone/iTunes).
and to incentivize them to upgrade their service plans, many mobile carriers subsidize the price of a new smartphone in exchange for a term contract with penalties for early termination. Contracts can also be used to reward loyalty, as in repeat buying from a given vendor: a frequent flyer program is basically a contract between airline and consumer that provides travel awards and other benefits, depending on how many miles the consumer flies on the airline. Contracts can also reward large purchases or purchase commitments with price discounts. Exclusive provisions in contracts can effectively “lock-in” the customer to that supplier for the duration of the contract. Of course, in all these instances, knowing and willing buyers and sellers can realize “gains from trade” by making such commitments to each other. Problems arise, though, when a buyer feels that they have to accept terms from a supplier because they are dependent on that supplier in some way. This possibility suggests the importance of examining the competitiveness of the market in which one observes these exclusive contracts or other switching cost-raising contract provisions. Suppliers can increase contract switching costs by bundling products together and discounting the bundled price relative to the prices of the services included in the bundle.

Transaction Costs: Especially in the case of services that are provided on a continuing or subscription basis, customers often incur costs of switching to an alternative supplier. Switching financial service providers, such as checking accounts, credit cards or investment management, often requires substantial time, effort, and expense. While many financial services providers attempt to make switching accounts easy, most consumers understand that it will be anything but. Recent developments in online financial services may, in some cases, have increased transaction switching costs, especially if consumers have set default values in software that is connected to their current supplier (e.g. have their accounting software linked to bank account), registered credit cards for automatic payments or online purchases (a Visa card on an Amazon account), or programmed their checking account to auto-payments to other suppliers (use of bank account to auto-pay monthly utility bills). The value of users’ time required to change these settings and values would constitute a transaction cost of switching from one bank to another.

One important aspect of transaction switching costs is the element of risk. In deciding whether to switch financial institutions, for example, consumers recognize that, even if the benefits exceed the expected costs of switching, there is almost always a risk factor. That is, there is some probability that the actual costs will exceed the expected costs of switching, if, for example, mistakes are made in the switching process—whether by the consumer, the current supplier, or the new supplier. Often, consumers amplify such risks, i.e. they perceive the risk as higher than it is. This is perhaps because such mistakes can be so exasperating when they occur. In any case, many consumers would admit to being dissatisfied with their current supplier, but do not switch because the risk-adjusted switching costs are too high.

In software and online services, one important source of transaction switching costs is the difficulty of moving data or files from one supplier to another (e.g. contact information to a different
organizer, or personalized information from one social network to another). Thus the degree of “data portability” can be an important determinant of switching costs. Another significant potential source of transactions switching costs is the use of, and degree of difficulty in setting or changing “defaults” (e.g. default browser, search engine, or media player).

**Search Costs:** In the process of making a choice between continuing to purchase from his/her current supplier, or to switch to an alternative supplier, consumers must first know or find alternatives. In some cases, alternatives are reasonably well known through advertising or product placement and promotion. In other cases, though, consumers incur the costs of searching for alternatives. In the satisficing model of consumer choice, consumers often initiate search for alternatives because they are at least somewhat dissatisfied with their current product or supplier. Two of the most important roles of advertising are directly related to search costs. First, advertisers provide free information to potential consumers to reduce their search costs, in case they are considering a switch. Second, advertisers attempt to persuade consumers that, whether or not they are dissatisfied with their current choice, there is a superior alternative available to them. Advertising is also used to convey that switching costs are low, or, in cases where there are significant non-search switching costs, the advertiser will pay some or all of the switching costs.

Whereas consumers incur transaction costs only if they make a switch, they incur search costs before they switch and, therefore, whether or not they ultimately switch. Thus, search can substantially affect other switching costs, because consumers conduct searches not merely to identify alternatives, but to obtain information about the costs and benefits of switching. For example, in deciding whether to change mobile phone supplier, a customer can search for alternative carriers, the quality of service on that carrier’s network (reducing uncertainty costs), whether there are lower-priced plans and/or subsidized devices available, and whether there are promotional pricing plans available to cover some or all of the costs of switching from another carrier (e.g. a contract cancellation fee). If consumers have a sense that search costs are high, and will be incurred whether or not they switch, that may be sufficient reason not to undertake the search, making their current supplier the “default.”

**Learning Costs:** Many goods are not merely “consumed:” they require consumers to actively participate in the use of the product in order to gain the benefits of the product. When a consumer uses a new type of product for the first time, they incur a learning cost, but it is not a switching cost. If products of a given type are similar in the way they operate and/or are operated (e.g. microwave ovens), there are little to no learning costs. The more significant are the differences across products, and the longer or more concentrated the effort required to learn how to use a different product, the greater the learning costs of switching between products. Computer operating systems and enterprise software are the prototypical products with high learning switching costs. Even if it were much easier to initially learn how to use software program A than program B, there could still be high learning costs associated with switching from B to A.
Uncertainty Costs: When a consumer is purchasing from one supplier, she gains information about the benefits of using that supplier from experience. For products that are difficult to evaluate without such experience (hence the term “experience” goods), the differential between the experience a customer has had with the current supplier and the lack of experience with alternative suppliers can represent a switching cost. Uncertainty about the degree of risk in switching exacerbates these uncertainty costs:

“Switching costs also reflect the business risk of changing vendors. Even if additional training and replication costs are minimal, the experience good nature of enterprise software, and uncertainty around how successfully a business will adapt to a new package, can lead executives to be heavily biased towards an existing vendor. This bias is enhanced by ‘urban legends’ of customers’ businesses being harmed after switching software providers.”  

An increasingly important method of reducing uncertainty costs is the use of consumer ratings and reviews of products in services, made easily available via the Internet. Whereas advertising presents information from the supplier’s point of view, ratings and reviews offer information about the experience of other users, which in many cases may be more relevant and less biased than suppliers’ advertising. The benefits of sharing experience are heightened when consumers have reasons to trust the raters (Facebook friends) or the rating methods (collaborative filtering on Amazon). Thus, the “pooling of experience” among users can reduce uncertainty costs to the point at which consumers are willing to switch (assuming other switching costs are not so high as to prevent it). On the whole, public policies should promote such activities.

If there are no or low switching costs of other types, uncertainty costs are not important: the consumer can try the product of one supplier, then try another and another, and finally choose the product that best suits their preferences. However, when other switching costs are high—or even moderate, uncertainty costs can amplify those switching costs. A prominent example of this phenomenon generates the “fatalism effect”: because consumers are uncertain about whether the services of another service provider are better than their current provider, the transactions cost of making a change prevent them from trying the other supplier to find out. This compounded effect of transaction and uncertainty switching cost effects mean consumers may not switch even when they are dissatisfied with their current supplier.

Shopping Costs: Even when consumers know which products or services they will buy, there are costs related to the buying process, i.e. shopping for the products. Whereas compatibility and transaction switching costs cause consumers to buy different, complementary products from the same supplier over time, the existence of shops offering a range of products thus helps consumers to save “shopping costs.” The switching costs examples above involved repeat purchases of the same

---

19 If service providers require term contracts, those contract switching costs further amplify uncertainty switching costs.
product or complementary products from the same supplier over time. Instead, shopping costs create incentives to purchase different products from the same supplier at the same point in time.

Some businesses are founded on the principle of reducing search and shopping costs: supermarkets and shopping malls, which make it easier for shoppers to identify and compare alternatives before making purchase decisions. For example, supermarkets add “fresh baked goods” departments to reduce the costs of shopping by replacing trips to two stores with a visit to a single store. In other lines of business, one observes the “Hotelling effect” in independent locational decisions by suppliers, which also have the effect of reducing search and shopping costs (e.g. auto rows, or a collection of specialty food stores). As we will see in Sections E and F, shopping costs are an increasingly important factor in Internet access and mobile services, as suppliers increase stickiness by offering bundles of services or even services plus content.

C. **HIGH SWITCHING COSTS IN PC OPERATING SYSTEMS AND THE MICROSOFT BROWSER CASE**

Microsoft has dominated the market for personal computer operating systems for three decades, mainly due to the prohibitively high costs users would incur if they switched to another PC operating system. These switching costs played a central role in the U.S. government’s monopolization case against Microsoft.

1. **SWITCHING COSTS IN PC OPERATING SYSTEMS BY TYPE**

   Compatibility Costs: A personal computer typically runs a single operating system that is compatible with the CPU; in turn the computer can run many different applications, so long as they are compatible with the operating system. Thus, the fact that many applications are compatible with Windows but incompatible with other operating systems such as Linux or Mac OS created very large switching costs. So high were those switching costs that most users did not even consider switching to an alternative operating system, at least not until they decided to buy a new computer.

---

21 As a practical matter, users switched to a different operating system only when they bought a different computer (e.g. switching from a Windows-Intel PC to an Apple computer).
22 We refer to United States v. Microsoft Corp., 253 F.3d 34 (D.C. Cir. 2001). Switching costs also played an important role in the European Commission’s case against Microsoft. Its 2004 order found that Microsoft had vertically leveraged control from its operating system to media viewers and interface standards between PCs and servers. See Farrell, J., & Klemperer, P. (2007). Coordination and lock-in: Competition with switching costs and network effects. In M. Armstrong & R. Porter (Eds.), Handbook of Industrial Organization, Volume 3 (p. 2011).
23 There are limited instances in which a computer can be partitioned to run two different operating systems (e.g. a Mac can run Mac OS and Windows, but most users do not have the technical sophistication to do so and, in this case, there is the additional expense of two operating systems.
24 Thus, we typically observe “uni-homing” in computer operating systems, at least on any given device. Of course many users have multiple devices, each with a different operating system (e.g. a Windows PC, and iOS iPhone and an Android tablet. It is rare, though, for users to change the operating system on any given device; indeed, in many cases it would be very difficult or impossible to do so.
Compatibility costs played a central role in Microsoft. In particular, users of Microsoft Windows enjoyed a vast array of applications designed specifically to work with Windows, but not with other operating systems (unless the applications were rewritten for them). What the Justice Department and the Court came to call "the applications barrier to entry" expresses the idea that it is difficult for a rival operating system to attract users when users who switch from Windows will bear a large compatibility switching cost. In other words, Microsoft created and exploited enormous network effects to lock-in Windows users to Windows applications, and, thereby, successive versions of Windows.

**Contractual costs:** When a user purchases an operating system, they are effectively entering into a contract for the right to use that operating system (i.e., a license agreement). Typically, consumers buy an operating system that is pre-installed on the computer they are purchasing. Microsoft enters into contracts with computer OEMs to pre-install Windows and Windows applications (e.g. Office, Internet Explorer) on the machine they sell. Microsoft used those contracts to disadvantage or exclude competitors of applications (e.g. the Netscape browser). Microsoft increased contract switching costs by bundling Windows and Office applications, selling the bundle at substantial discounts off the sum of the prices of those products if purchased separately.

**Transaction Costs:** If a user were to switch from Windows to a different operating system, she would also have to replace most or all of her applications programs, since Office and other Windows-compatible programs are not compatible with other operating systems. Likewise, in many cases, documents, files or content created with Windows applications would at minimum need to be converted to different formats to be useable with those newly purchased applications. In the worst cases, the formats are not only incompatible: there are no practical means of converting them. For these reasons, the transactions costs of switching away from Windows/Office were extraordinarily high, which is why many of us continued to use Windows/Office. Moreover, the high transactions costs of switching back to Windows/Office, after switching to Mac OS, would essentially be the same, compounding the learning and uncertainty costs of switching in the first place. It should be noted, though, that these transaction costs are being lowered by technological change, as “competition for the market” provides incentive for sellers to reduce the switching costs of proprietary systems and/or offer a competing open system. For example, Cloud-based Google Docs is becoming a significant competitor to Microsoft Office.

**Search Costs:** Switching from one computer operating system to another—e.g. from Windows to Linux—first requires searching for alternative operating systems that are compatible with the hardware at hand. Typically, though, switching from one OS to another also requires switching applications programs and/or files that were created with those programs. Thus, there are

---

25 Using computer-to-computer transfer programs, a user can copy the entire contents of her current computer to a new one, including—if the current and new computers run the same operating system—all of the applications programs. Then, consumers can buy a new computer without those applications pre-installed and, therefore, at a lower price.
substantial search costs for users to identify what the alternative operating systems are and
determine whether their current applications programs and files will be compatible with an alternate
operating system.

**Uncertainty Costs:** There are numerous uncertainty costs associated with switching from
Windows/Office. Included among them are not knowing whether or not applications will be available
for the alternate operating system; whether files will be convertible into a format that is compatible
with the new applications; and, not least, whether—once the user has learned how to use the new
operating system and applications—she will actually find it preferable to Windows/Office. Many of
these costs are inherent switching costs, but some may be strategic. Competitors have frequently
complained of Microsoft’s efforts to increase uncertainty switching costs by spreading “FUD” (fear,
uncertainty and doubt) about competitors’ products.26

**Shopping Costs:** Even if a consumer is buying a new computer based on the Windows
operating system, there are shopping costs involved. However, by our definition, those are not
switching costs.27 Rather, the shopping costs of switching are only those additional shopping costs
associated with changing from Windows-based computer to an alternative (e.g. a Mac or a
Chromebook). Those additional costs include the costs of finding that combination of hardware and
software that will replace the current setup, as well as the costs of finding software or other methods
of converting files from the current operating system and applications to the new.

**Learning Costs:** Due to substantial differences in user interfaces, instruction sets and
capabilities of operating systems and application programs, there are substantial learning costs
associated with switching from Windows/Office to competing systems. Moreover, the longer
someone has used Windows/Office, the higher those learning costs become. Users are well aware of
these learning costs, which therefore represent a very high hurdle to switching. Indeed, there are
high learning costs of switching from the Windows version of Office products to the Mac OS version,
due to dramatic differences in user interfaces, toolbars, and command structure.

2. **Switching Costs were Key to Showing Monopoly Power & Monopolization in Microsoft**28

The Department of Justice (DOJ) successfully proved in *Microsoft* that the relevant market was
Intel-compatible PC operating systems. The Court viewed the Macintosh operating system (Mac OS)

---


27 Nor, by definition, do the shopping costs incurred by a first-time computer buyer constitute switching costs.

28 *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C.Cir. 2001)
as outside of the market because “customers would not switch from Windows to Mac OS in response to a substantial price increase because of the costs of acquiring the new hardware needed to run Mac OS (an Apple computer and peripherals) and compatible software applications, as well as because of the effort involved in learning the new system and transferring files to its format.”

After defining the market, the DOJ needed to prove Microsoft's monopoly power. Microsoft's share of Intel-compatible operating systems exceeded 95%, but a high share does not alone prove that a firm has monopoly power. If entry is sufficiently easy and switching costs are low, the threat of entry can constrain a firm’s prices to competitive levels. Switching costs were the cornerstone of the DOJ’s case; the government argued that the application barrier to entry: with Windows, consumers had access to more than 70,000 applications. Most of these applications were not available on other operating systems because porting (i.e. "switching") them to other systems was too costly.

From consumers’ perspective, this applications barrier to entry represented a cost of switching away from Windows. From the perspective of applications developers, it resulted from the high switching cost of modifying software code to make it work on a non-Windows operating system. Microsoft was naturally concerned about anything that would—or had the potential to—erode the applications barrier to entry, which is what Netscape threatened to do.

Even though cloud computing was in its infancy in the 1990s, the threat to Microsoft's operating system monopoly was apparent. Netscape exposed application program interfaces (APIs) that allowed software on distant servers to do computing and communicate results in useful ways with a user’s personal computer. Many of these APIs were part of the Java virtual machine (JVM) that came with every installation of Netscape. Since Netscape and the JVM were being made available across most platforms—not just Windows—they had the potential to commoditize the operating system if a sufficient mass of useful programs were written to use these APIs. Sun's slogan for Java was "Write Once, Run Everywhere," the idea being that an application could be written to call on the JVM and it would work regardless of the physical hardware or the operating system on which the JVM operated.

Netscape thus threatened to erode the application barrier to entry, so that all operating systems would compete on their intrinsic merits. Moreover, if Java and Netscape-based applications worked across operating systems, then users would not become locked into Microsoft’s operating system by learning applications unavailable elsewhere or by investing in non-portable data. Since Microsoft in many ways created and exploited the switching costs inherent in the applications barrier to entry, it could not afford to risk Netscape becoming ubiquitous. Bill Gates, Microsoft's CEO,

29 Ibid at 52.
30 Ibid at 55-56.
decided to build Internet Explorer and, in the words of former Microsoft Executive Paul Maritz, "cut off Netscape's air supply."32

The problem from Microsoft's vantage was that Netscape threatened to lower switching costs for consumers who changed operating systems. Microsoft's basic strategy was to make sure that as many users as possible got Microsoft's browser, Internet Explorer (IE), as their default browser and then to make switching away from IE as difficult as possible. This would maintain the incompatibility of applications (and Microsoft's application advantage) so that it would be costly for users to switch away from Windows.

Microsoft orchestrated a thorough campaign intended to promote Internet Explorer and kill Netscape. It did so by strategically raising contractual, transaction, and uncertainty switching costs. It began by signing up deals with computer manufacturers (OEMs), Internet service providers, and Apple to install IE and not Netscape.33 Later it technologically bundled IE by making it impossible to (completely) remove IE from Windows. Finally, Microsoft lied to developers telling them that IE contained a "pure" JVM so that software designed for Microsoft's JVM could run on any JVM, when in fact designing software for Microsoft's JVM meant creating another application that tied users to Microsoft's operating system or to whatever systems for which Microsoft chose to implement its own version of the JVM.

Unfortunately for consumers, the high switching costs in PC operating systems persist, and, accordingly, Microsoft's ability to exploit its monopoly power to disadvantage competitors in the market for Internet browsers. Recently, the European Commission (EC) has issued a warning to Microsoft that it should ensure consumers are able to easily switch browsers in Windows 8. Among the specific concerns that the EU has raised are that “[i]f a user decides to set a rival browser as a default browser, there should not be an unnecessary warning in Windows or confirmations by the user and the Internet Explorer icon should also be unpinned from the Start screen.”34 The EC has also found that Microsoft violated its agreement to offer users a choice of browsers between February 2011 and July 2012. Microsoft failed “to display a browser choice screen to users,” citing a “technical error” as the reason.35 This agreement with the EC stemmed from a previous EC investigation of antitrust violations of Microsoft and the sanction for breaking it could cost Microsoft over $7.4

Because Microsoft does not have monopoly power in the market for mobile operating systems, the EC has decided not to take action on Microsoft’s Windows RT, an operating system designed for the tablet market. Joaquin Almunia, the EC Competition Commissioner, has stated that there were “no grounds” for an intervention, even though Windows RT only allows Microsoft’s Internet Explorer to be used.

D. LOW SWITCHING COSTS IN INTERNET SEARCH

This section first examines each type of switching costs in Internet search. It then presents a brief review of empirical evidence and studies regarding the low switching costs of search—among generalized search engines, and across generalized search, vertical search and other means of finding information on the Internet. It is important to note that generalized search engines typically operate in a “two-sided market,” with users on one side and advertisers on the other. In almost all cases, search engine operators price their service at zero in the first market, and earn revenues from advertisers in the second. While this paper does not address switching costs in the advertising market, it is critical to understand that success on the advertising side of the search market is dependent on success in attracting search users and usage.

1. SWITCHING COSTS IN ONLINE SEARCH BY TYPE

Compatibility Costs: Whereas Windows operating system is a proprietary platform, Google Search—and other forms of Internet search and discovery—run on the open Internet platform, i.e. the World Wide Web. Typically, Google and other generalized search engines attract users by offering free search services (“native” or “organic” search results) and charge advertisers whenever users click-through on “sponsored” search results. However, in contrast to Windows, any computer or mobile device using any operating system and any Web browser can reach any search engine, once the computer is connected to the Web. Thus, for the user side of search, the Web is the platform:


39 Note the fundamental difference between the proprietary Windows OS and Apple iOS on the one hand and Android OS on the other: Android is an open source operating system, the source code which can be downloaded from the Internet and modified by OEMs for their devices. The source code for Windows is proprietary and not available even if the OEM has a contract with Microsoft for its devices to run Windows. Only Apple devices run iOS.

40 See “Advertise Your Business on Google” (http://www.google.com/ads/adwords2/) for an overview of Google’s AdWords search advertising service.
open system that promotes interconnectivity and interoperability through a set of industry standards, such as HTTP (hypertext transfer protocol) and HTML (hypertext markup language). The Web is the ultimate compatibility platform; indeed this extraordinarily high level of compatibility across so many divergent devices and operating systems largely accounts for the explosive growth of the Internet.\footnote{Thus, in search, we typically observe “multi-homing,” as consumers use a number of different search methods, including one or more generalized search engines, vertical search engines, mobile applications, and others.}

Thus, while any given user typically has one and only one operating system per computer, any user can access an unlimited number of websites and can reach those websites through an unlimited number of paths, by searching on a generalized or specialized search engine, by entering a Web address manually, or by clicking on a bookmark or a link in another website or an email. The more actively a consumer uses the Internet, the more likely they are to have learned the many different means of getting the information they seek and getting where they want to go on the Internet.

**Contractual Costs:** While OEMs may also have contracts to set Bing or Google as the “default” search engine on a computer or smartphone\footnote{For an overview of a previous discussion to switch the default search engine from Google to Bing on Apple’s mobile devices, please see: Paul, I. (2010). Bing to Become the iPhone’s Default Search Engine? , from http://www.pcmag.com/article/187261/bing_to_become_the_iphones_default_search_engine.html. Similarly, HP reached a deal with Microsoft to set Bing as the default search engine in its devices. See Johnson, N. (2010, January 7, 2010). Bing to Be the Default Search Engine on HP Devices. from http://searchenginewatch.com/article/2051356/Bing-to-Be-Default-Search-Engine-on-HP-Devices.}, changing the default setting to a different search engine is trivial, that those OEM contracts do not generate contractual switching, in contrast to Microsoft’s OEM Windows/Office contracts. Moreover, the use of a search engine requires no license agreement between the user and the supplier. Just as there is no need to buy the right to use a search engine, there is no need to buy upgrades. Rather, search engines are continuously upgraded and improved, at no cost to users.

**Transaction Costs:** Across search engines, whether general or vertical, there are virtually zero transactions switching costs. Users not only frequently switch search engines between search sessions, they often switch during a search session. And switching is bi-directional: it is as costless to switch from Google to Bing as it is from Bing to Google. Likewise, users can easily change default settings for search, and just as easily change them back again. To coin a term, “switch-back” costs are low.

**Search Costs:** There are minimal if any search costs for switching search engines, in part because consumers can use a search engine to search for alternatives.\footnote{For example, a Bing search on “search engine” returns many results, including individual search engines and guides to or reviews of search engines (http://www.thesearchenginelist.com/).} Indeed, even when users are not explicitly looking for other search engines, the search engine they are using often return links to
other search engines. If the user finds those other search engines helpful, it is a simple matter to bookmark them or install an app for direct access in future uses.

**Learning Costs:** There are little or no learning costs associated with the use of search engines, general or vertical. While there are many slight differences in user interface or presentation of results, most users can begin using a new or different search engine almost immediately: as there is no learning curve, there are no switching costs.

**Uncertainty Costs:** There are low uncertainty costs of switching search engines. As the evidence will show, users do care about the quality of results they obtain. Therefore, uncertainty about whether an alternative search engine may or may not present better results could represent a switching cost. However, given how low all of the other types of switching costs are, it is very easy for users to try an alternative engine to see whether it produces the desired results (which, needless to say, vary significantly from user to user). A user can simply open two browser windows or tabs to compare search results side-by-side in different search engines. Indeed, Microsoft is currently running a “Bing It On” challenge, encouraging users to compare Bing and Google results side-by-side. These low switching costs explain why most users actually use more than one search engine, typically a combination of a default generalized search engine, other GSEs, and a stable of vertical or specialized search engines for particular purposes (e.g. travel booking, product review, product purchasing, people finding, etc.).

**Shopping Costs:** If there are any shopping costs to switching to alternative search engines, they are close to zero. Indeed, one important use of search engines is finding other search engines, whether in the organic or sponsored results. The Web is the ultimate “department store,” with a practically infinite number of “departments,” all located conveniently on the user’s computer or mobile device, and all reachable by many different means.

2. **Evidence of Switching Among Generalized Switching Engines (GSEs)**

As a general proposition, the more often a user searches for particular types of information, the more likely the user has developed preference for special purpose websites and navigates directly to those websites through recall, bookmarks or apps. Thus, not surprisingly, the data show that a majority of searching is done on special purpose websites, not GSEs (and those data do not include

---

44 For example, a Google search on “restaurants Melbourne” generates many individual restaurants, but also returns links to vertical search engines: www.melbournerestaurants.com.au; www.agfg.com.au; and www.tripadvisor.com

45 Indeed, at http://blekko.com/ws/+monte, users can compare search results of Blekko, Bing and Google in three side-by-side columns.


47 According to Nielsen, in December 2011 in the US, 59% of Google’s audience visited another of the top 4 search sites (Bing Web, Yahoo Search and Ask.com). Nielsen Household Internet Panel data, 4Q2011.
"searching" on vendor sites), and that only 4% of users’ online time is spent searching on GSEs. Also, switching costs among different types of search engines are not substantially different switching from one GSE to another. Even if there is a tremendous volume of searches on GSEs, though, that does not necessarily mean that a narrow market definition is correct for antitrust purposes. In any case, we will first evaluate switching costs among GSEs, but then across the broader range of Internet search alternatives available to and used by consumers. Indeed, the lower the switching costs across types of search alternatives and the greater the observed switching, the stronger the argument for defining the relevant market more broadly.

We note, though, that one should not assume that the degree of switching is an indicator of switching costs: whereas a high rate of switching almost certainly indicates low switching costs, low switching does not indicate high switching costs. Accordingly, the UK’s Office of Fair Trading recommends that one should not focus “on the rate of switching alone,” because a relatively low rate of switching may simply reflect the fact that consumers’ preferences between products are stable. This explanation is supported by evidence that consumers easily can and readily do switch to alternatives, but then switch back to their preferred search engine.

With those caveats, we turn to empirical evidence of actual switching among search engines. Numerous recent studies at Microsoft Research (or authored by Microsoft researchers) have found that switching is easy and frequent:

“A user’s decision to select one search engine over another can be based on factors including reputation, familiarity, effectiveness, and interface usability. Searchers may not use the same engine for all queries; they often switch between different engines within and between sessions.”

“Of the 14.2 million users in our log sample, 10.3 million (72.6%) used more than one engine in the six-month duration of the logs, 7.1 million (50.0%) switched engines within a search session at least once, and 9.6 million (67.6%) used different engines for different sessions (i.e., engaged in between-session switching). In addition, 0.6 million users (4.4%) “defected” from one search engine to another and never returned to the previous engine.”

---


51 White & Dumais (2009), page 3.
Note that this Microsoft Research study only counts switching between GSEs, during or between “search sessions.” If a user switched from a GSE to a VSE, that event is treated as an “end” to the search session, rather than a switch to another search engine. Given the extraordinarily large number of vertical search engines—and the frequency with which they appear in the native search results—that restricted definition of search likely understates the frequency of search engine switching to a substantial degree.

Even with that limitation, the Microsoft research found that dissatisfaction with the search results was the primary reason that searchers switched engines:

“40.4% of subjects reported having defected from one search engine to another and never or very rarely returning to the pre-switch (origin) engine. 82.7% of subjects reported that they were happy with their decision to defect... The main reasons for defection were many dissatisfactory experiences with the origin engine (43.9%), one particularly dissatisfactory experience with the origin engine (7.9%), more relevant results on other engine (20.1%), or a new entry point such as a browser search box or optional browser toolbar (28.1%).”

The Microsoft researchers concluded that:

“The reasons for switching are varied and include: perceived poor quality of results on original engine, desire for verification or additional coverage, and user preferences. Approximately half of all users in our log sample and around two-thirds of survey respondents engage in within-session switching. It is clear that the utilization of multiple search engines is an important aspect of users’ Web search behavior. Since switching is mainly associated with dissatisfaction with the search results on the origin engine, that engine could tailor the search experience for queries with a high observed switching rate.”

These Microsoft Research results are reinforced by a recent SlingshotSEO study, which highlighted the difference in the effectiveness of search results between Bing and Google, largely explaining users’ preference for the latter over the former. The SlingshotSEO study found that Bing’s click through rate for the 1st result on a search result page was only half that of Google’s (9.66% vs. 18.20%). In addition, looking at click-through rates for the top 10 search results shows that for the keywords in question, Bing’s search results page leads to a lower conversion, in the form of a click, than Google’s results page. This marked difference in click-through rates between Google and Bing indicates that Google is returning search results that better meet users’ needs, and could explain the

___________________________

52 Ibid., page 4.
53 Ibid., page 9.
54 “A Tale of Two Studies: Google vs. Bing CTR”, SlingshotSEO, May 2012, available at http://www.slingshotseo.com/blog/a-tale-of-two-studies-google-vs-bing-ctr/. SlingshotSEO also found that users clicked-through to Google’s top organic results at roughly double the rate of Bing search results: second result, 10.05% v. 5.51%; third result, 7.22% v. 2.74%; fourth result, 4.81% v. 1.88%.
preference of Google users over Bing. Because users differ in their preferences, though, other users prefer Bing as their first choice of GSE.55

SlingshotSEO also noted the ease with which users can switch from one search engine to the other: by entering the name of the “other” search engine into the search bar of the “origin” search engine:

“Every month, roughly 117 million searches are made for “google” in Bing. It’s hard to fathom why one would search for a search engine while using a search engine, but let’s face it, users are aware that Bing and Google provide very different results. To put this number in perspective, consider the fact that, on average by month, only 55 million searches are made for ‘google’ in Google and 4 million searches are made for ‘bing’ in Google.”56

This is but one example of a broader phenomenon: the use of a GSE not for searching, but as a “navigational aid.” Evidently, many users find the easiest way to get to Facebook is by entering “f” in the search bar (both Bing and Google’s autocomplete function lists Facebook as the first entry when “f” is entered), allowing the user to click on Facebook to go to Facebook. This probably explains why “Facebook” was the number one search entry on search engines in 2011. In fact, all of the top 10 search terms in 2011 were navigational in nature with terms like “ebay,” “youtube” and “craigslist”.57

In addition, comScore also notes a similar trend in navigational searches:

“About 12.5 billion searches were performed in July on the Big 5 search engines (Google, Yahoo, Bing, Ask, AOL Search) in the United States. Of those, approximately 1.9 billion were navigational in nature, or more than 15 percent of all searches in a given month.”58

The use of a search engine to easily navigate to other sites all but eliminates the costs of switching to an alternative GSE, VSE or other site. When users enter “a” into the GSE’s search bar, they are often navigating to “Amazon” to search for products, product reviews and the like, as well as with many other sites to which users navigate by use of a GSE search bar. Arguably, counting these as “searches” overstates the frequency of searches on GSEs and understates the ease of switching from a GSE to other search methods or navigating directly to other sites.

Overall, these findings are significant on two counts: they demonstrate that users do switch among search engines and they explain why users switch, i.e. “switching is mainly associated with dissatisfaction with the search results on the origin engine.”59 These facts are critical for success in


56 Slingshot, May 2012, op. cit.


competing for search engine users: the better the results, the less likely users are to switch. But conversely, if search results are degraded—for whatever reasons—users are more likely to switch to an alternative. In extreme cases, users defect: they switch search engines and do not switch back. If users defect from a search engine—or use it less—that would translate directly into fewer advertising revenues and lower profits: strong reasons not to degrade the quality of search results.

3. **Alternatives to Generalized Search Engines for Searching**

Market share data for search often assumes a "narrow" market definition for search, one that includes only generalized search engines (GSEs), such as Google, Bing and Ask. However, when consumers are searching for information on the Internet, from a computer or mobile device, they have a rapidly growing number and improving quality of alternatives to GSEs. So, the first choice consumers typically make is where and how to search for information, and that choice typically involves a host of alternatives, including vertical search engines (VSEs) such as BizNar, Technorati, or KellyBlueBook. There are also a growing number of special purpose sites (SPS) that offer specialized search capabilities, including content sites (e.g. NYTimes, CNET), content aggregators (Pulse, FlipBoard, Huffington Post), comparison shopping sites (BizRate, NexTag), multiple-vendor retailing sites (Amazon, eBay), price comparison sites (Kayak), booking sites (OpenTable, Expedia), and product vendors (United.com, Ford.com). There is a growing use of social networks to search for information (e.g. which movies do my Facebook friends “like”). It is also apparent that search engines face growing competition from mobile apps and “search intermediaries”, such as Apple’s Siri.

Moreover, the costs of switching among these alternatives are low or even zero. So, not surprisingly, there is abundant evidence that a growing amount of “search” is being done on vertical search engines, or on websites or apps that are not typically considered search engines—even though they compete directly for users who are looking for information on the Internet. Let us consider some of that evidence.

a. **Evidence on Switching Between Vertical Search and Generalized Search**

As Katz (2010) found, the ability of consumers to use a combination of general and vertical search engines to find information is not hindered by switching or “multi-homing” costs. Hotchkiss (2010)\(^\text{60}\) found similar results in a survey on search engine usage. When it came to searching for more specific results, he found that of those surveyed,

“80% of the searchers would use a well-known non-search site to help narrow down their choices. For travel related searches, these would typically be a travel portal such as Expedia.com or Travelocity.com. For home electronics, it could be a well-known retailer, such as Circuit City. We also found E-bay and Amazon used for this purpose as well.”

Increasingly, some believe the greatest threat to Google is Amazon:

\(^{60}\) See Hotchkiss, Gord; “Into the Mind of the Searcher,” 2010.
"Google and Amazon both have the same end goal, to be the destination that people go to do their product searches, and Amazon's winning that battle," said Michael Griffin, founder and chief technology officer of Adlucent, which does search marketing for online retailers.61

In other words, horizontal search engines sometimes provide too much “noise” in cases where users are specifically looking for shopping, travel, or other “vertical” fields. Thus, vertical search engines can provide more focused results depending on the intent of the searcher. Not surprisingly, therefore, vertical searches are a significant portion of total online searches, serving a third of all search volume.62 In response to vertical search engines, generalized search engines such as Bing and Google are attempting to improve their performance in focusing results according to users’ search queries.

One of the reasons VSEs are competitive with GSEs is that switching costs are so low across vertical search engines and between vertical and generalized search. Unlike an operating system, Internet users can easily have a “stable” of vertical search engines (and other means of searching the Internet) with zero marginal costs. Moreover, in the virtual world, “shopping costs” are essentially zero. Recall, from Section B, that the reduction of shopping costs explains both department stores and supermarkets on the one hand, and closely situated specialty stores on the other. Consider one block on College Avenue in Berkeley, for example, with an independent wine and cheese shop, a fresh fruits and vegetables market, a meat and seafood market, a bakery-patisserie and a pharmacy. Directly across the street is a supermarket, with all of those food items and a good deal more.

In these brick-and-mortar examples, the specialty stores are analogous to vertical search and the supermarket, to generalized search. But while those independent stores have reduced shopping costs as much as possible by locating so closely together, there are still significant shopping costs and transactions costs (e.g. waiting in line for service and/or to check out at each store visited). Contrast the brick-and-mortar case to the virtual world of vertical search: a user can easily set up bookmarks for a host of vertical sites such as product review and purchasing (e.g. Amazon or eBay), travel reviews (TripAdvisor), travel price comparisons and/or booking (Priceline, Kayak, Expedia), news (New York Times, Flipboard, Pulse), and as many more as the user chooses. The cost of identifying these sites is near zero, as is the costs of switching from one to another. Indeed, one of the primary benefits of generalized search engines is that, each time a GSE takes a user to a VSE that the user finds particularly well-suited to her preferences, the user can bookmark that site (and/or sign up for email alerts or RSS feeds), which makes it costless for the user to return directly to the site without using the GSE as an intermediary. The same logic also applies to apps, which explains why many customers have a stable of apps to easily and costlessly navigate to a wide range of specialized sites or information without the use of a GSE.


b. Evidence on Switching Between GSEs and Mobile Apps

The recent boom in mobile device use has not only led to an increase in internet usage with the ubiquitous nature of data plans, but has also led to a shift in consumer focus from traditional browser and webpage-based Internet services and portals to mobile applications. These applications, especially with the introduction of the iPhone, Android devices and other smartphones, have become a significant source of business for web developers. Services such as local business reviews, weather forecasts, and social networks are increasingly served through mobile applications. With over 700,000 applications in the iTunes App Store and over 550,000 applications in the Android Market, it is not surprising that applications are now competing with traditional web pages.

In fact, as of June 2011, the amount of time spent with mobile apps per day per person reached 81 minutes compared to 74 minutes on the web. This represented an 88% increase in time spent with apps as compared to June 2010. In December 2011, the amount of time spent with mobile apps per day per person increased again to 94 minutes, with the amount of time spent on the web decreasing to 72 minutes.65

This is an especially important trend: not only are consumers switching away from the traditional Web consisting of websites and webpages, but they are finding that applications such as Facebook and Yelp are providing more directed and focused portals of information. Searching horizontally is no longer a necessary precursor to finding specific information on the Internet.66

Not surprisingly, industry analysts have highlighted the growing competition between Web search engines and mobile apps, and the ease with which users can switch between the methods of finding information and answers to questions:

“Behold the biggest threat to mobile search -- apps. . . It’s much easier to interact with content through an app than through Web pages. And it’s much easier to complete a task through instructions than search queries.”67

“[A]s we shift our usage to the mobile web...we’re using apps. On their face, these apps don’t seem like search at all. Except they are... [f]or nearly every structured set of results, there’ll be an app for that, if there isn’t already.”68


66 A comparison of the most popular Websites to Apple Store’s most popular apps found that search categories like retail, lyrics, navigation, email, games, video, news, reference, and weather all had free apps for Apple devices, so users could skip the use of a search engine entirely. See “How Apple Killed the Future of Search,” 24/7 Wall St., April 2010, http://247wallst.com/2010/04/08/how-apple-killed-the-future-of-search/.

“Our mobile app accounted for approximately 40% of all searches on our [Yelp!] platform for the quarter ended September 30, 2011.”

Given the growing number of platforms that provide APIs and the resulting explosive growth in apps for Apple, Android, Microsoft, Facebook, Twitter and other platforms, it is evident that the competition between apps and search engines—generalized and vertical—will continue to increase.

c. Evidence on Switching Between Social Media Search and Generalized Search

A recent comprehensive report by Outbrain found that social networks are becoming a significant referral source for content pages: “While search still reigns supreme in terms of directing traffic to content pages (41% of external referrers), social is gaining share at 11%.” This view of the growing importance of social media for search is shared by a number of observers:

“As people spend more time on Social Media sites, it would be logical to assume that they would do more Search activity on these sites. Use of portal sites and direct entry (to Websites) appear to have declined as a means to Search for content . . . as Facebook increasingly socializes content and commerce, we would expect people to find rich Search results influenced by social signals from their friends.”

“In [Google’s] web, everything starts with a search . . . . But in recent years the web has tilted gradually, and perhaps inexorably, toward [Facebook’s] world. There, rather than search for a news article, you wait for your friends to tell you what to read. They tell you what movies they enjoyed, what brands they like, and where to eat sushi.”

Social networks and blogs consume almost a quarter of U.S. users’ time online. In comparison, only 4% of U.S. users’ time is spent on search.

“[G]rowth in search advertising is slowing, and advertisers are putting more of their limited dollars into Facebook, with its 800 million users, many of whom spend more time on Facebook than on any other site.”

---


74 Helft & Hempel (2011).
“Advertising revenues at Twitter grew 213% to $139.5 million in 2011—the company’s second full year of selling advertising—and strong international growth is expected to push the company’s ad revenues to $259.9 million in 2012... By 2014, eMarketer estimates, global ad revenues at Twitter will reach $540 million.”

**d. Evidence on Arrival Rates at Websites Directly or Indirectly, Not From a GSE**

Whereas a user cannot operate a personal computer without an operating system, one can search and find information on the Internet without using a GSE. Most important of these is by entering the URL of favorite sites (or clicking on bookmarked favorites). Outbrain found that 67% of all “arrivals” to websites were direct to the site (i.e. the user entered the URL or clicked on a bookmark or email link) or from the site itself (i.e. the user clicked on a link on the site to bring up another page on the same site) or from an unknown origin; 10% of arrivals were from other content sites; and 6% were from Web portals. Arrivals from generalized search engines represent only 14% of the total visits to Websites.

**e. Evidence on Competition between Emerging Technologies and Generalized Search**

In addition to the rapid growth in vertical search, newly emerging technologies are beginning to have a significant impact on the means and methods used to search for information or find answers to questions on the Internet. Due to rapid technological change—for example, enormous strides in voice recognition and artificial intelligence—technological advances will increase alternatives to traditional search and further reduce switching costs among those alternatives. Perhaps the prototypical example of these developments is Siri, which is fast becoming a direct competition to GSE’s, as noted by industry analysts:

“On top of apps, there is also a significant restructuring of the search paradigm, especially with regards to mobile devices. With the introduction of services like Apple’s Siri, the search box is starting to be relegated to the back-end technology behind such services, instead of a visible site that users visit. With aggregation and personal-assistant like services likes Siri, the search engine in the background becomes irrelevant to the user insofar as it delivers useful information to the top-end application.”

“Siri could seriously reduce how much we use Google’s services and revenue in the long run. Siri is a serious game changer...”

---


“There’s an obvious reason Apple would sit on [Google’s new natural speech-to-text search] app. It competes with Siri. Siri goes out of its way to avoid searching Google... Apple wants users to be in the habit of asking Siri for everything.”

Siri and other similar “personal assistant” applications have the potential to bypass generalized search engines substantially or entirely. By inputting a verbal request for facts, location information, or commands, search engines are relegated to the background, providing only as much information as is requested by the user. This trend in mobile and desktop automation will bypass traditional search engines and reduce the role of conventional search advertising. Given the extraordinary rate of technological advance in computing, artificial intelligence, software, applications development, cloud computing services and communications devices, it is a near certainty that Siri is just the first of many fundamentally different approaches to searching and finding information on the Internet. And, because the Web is an open platform, with industry standards and a high degree of compatibility, it is also a near certainty that the costs of switching among these alternatives will be extremely low.

4. Implications for Competition Policy

Low switching costs should and likely will have important implications for antitrust analysis of Google. First, just as high switching costs helped to narrow the market to Windows OS in the Microsoft case, a relative absence of switching costs provides a good reason to include vertical search engines in an antitrust market. No single vertical search engine or even all of them combined are a perfect substitute for a universal search engine, but they don’t need to be to provide meaningful competition. Low switching costs mean that users can switch to use a portfolio of vertical search engines, or other search applications when convenient, and use Google, Bing, or Yahoo or other GSE when they are most convenient—i.e. in a multi-homing context.

Second, low switching costs means that Google does not have market power even if the market were incorrectly defined to include only generalized search engines. Market power means the ability to profitably charge more than a competitive price for the goods in a market. Search is given to searchers for free; money is made from advertisers. Despite Google’s current popularity it is doubtful that Google has market power with respect to search users. If Google began to charge users anything to search on its site, let alone a significant price, it would surely lose a substantial share of its users to Bing, Yahoo or other services.

A third implication of low switching costs is that Google must continue to innovate and stay ahead of other search engines. Google is vulnerable to any firm that presents users with more


80 Siri and other personal assistants can also obtain information from, or direct users to, vertical search sites such as OpenTable and Yelp.
relevant and desirable search results. Moreover, if Google reduces the quality of its search results—for whatever reasons—users could easily switch to search alternatives, reducing the economic value of advertising on Google search.

E. **Switching Costs in Internet Access Services**

Having examined the extreme cases of prohibitively high switching costs in PC operating systems and extremely low switching costs in online search, we turn now to two communications markets in Australia with moderate switching costs. Before doing so, though, it should be emphasized that it should not be assumed that the presence of switching costs is necessarily harmful to competition:

“The main message of our report is that that is not necessarily the case. Switching costs do affect how competition works in a market but they do not necessarily make markets less competitive... All of this implies that the most important factor in assessing the effectiveness of competition in a market with switching costs is market dynamics. A dynamic assessment of competition is important in any competitive analysis, but even more so in a market with switching costs.”

In making a dynamic assessment of the effects of switching costs, a key factor is the intensity of *ex ante* competition, i.e. competition for customers before customers become “locked-in,” by contract or by the costs of switching to another supplier. If *ex ante* competition is intense, then customers may have realized *ex ante* benefits, in the form of introductory price discounts, a subsidized mobile device, or the like. In some cases, those benefits may offset the higher prices they pay later due to switching costs, which, therefore, do not necessarily cause harm to consumers. On the other hand, if *ex ante* competition was not intense, then even moderate switching costs could raise overall prices above a competitive level.

1. **The Australian Market for Internet Access Services**

Internet Service Providers (ISPs) provide retail internet access service to end users. Some ISPs (“facilities-based”) own the infrastructure over which they provide Internet access, but most do not: they buy in the wholesale access market and resell in the retail market. It is estimated that ISP industry will generate $7 billion in revenues this year; it is one of the fastest-growing communications services, with 1.9% annual growth over the past five years, and 6.1% growth in 2012-13. As broadband penetration enables faster access speeds, customers are increasing their use of data-intensive applications such as online commerce, video sharing, content downloads, and online gaming. It is expected that “ISPs will benefit from another five years of phenomenally strong revenue growth.”


82 IBISWorld, “Internet Service Providers in Australia Industry Market Research,” SFGate, October 24, 2012
The number of ISPs has been falling due to industry consolidation, resulting in a moderate degree of market share concentration; the top four players in the industry are Telstra-BigPond (3.5 million fixed internet subscribers), SingTel Optus (1 million), iiNet (650,000), and TPG Telecom (516,000). The high-fixed cost nature of the industry has encouraged merger and acquisition activity among smaller ISPs, with TPG Telecom and iiNet experiencing the biggest gains in market share from M&A. Some observers expect further consolidation among ISPs, for reasons of scale economics and the increased frequency of content bundled with access services. Telstra already has more subscribers than the other three biggest players combined, but has recently announced its intention to purchase Adam Internet, increasing Telstra’s market share from 45.3% to 46.7%. If consummated, this acquisition could put further pressure on Optus, iiNet and TPG to continue their acquisition activities.

Increasingly, the largest ISPs are offering their services in bundles, further increasing scale and scope economies, adding to the pressures for industry consolidation. As I will discuss shortly, bundled services also increase switching costs, which may or may not be offset by ex ante competition in the market for customers. The service bundles of the largest four ISPs include:

- Telstra offers bundles of broadband home internet with home phone service. Consumers also have the option of adding a T-Box to the bundle. A T-Box is an internet television device which can act as a DVR for normal over the air television and provides unmetered access to BigPond (Telstra) movies and television to rent if bundled with an internet plan. Formerly, if a consumer added Foxtel Platinum iQ (a pay TV package from Foxtel) to one of the bundles, they received a $22 a month discount. This package no longer appears on Telstra’s website.

- Optus offers bundled broadband and home phone plans like what Telstra offers. It also offers a bundle of home phone, broadband internet, and internet TV (through a service called Fetch TV). Fetch TV is a set top box that acts as a DVR for normal over the air television and

---

87 Ibid.
88 Ibid.
provides unmetered access to movie rentals and premium subscription TV channels. Optus’ version of Fetch is branded Optus TV with Fetch. Additionally, Optus offers bundles that include Fetch and either a post-paid mobile plan or a fixed broadband plan. Finally, Optus offers a bundle where a consumer can purchase Foxtel pay TV service and an eligible Optus product (cable broadband, home phone, or post-paid mobile), and receive an additional TV set top box.

- iiNet offers bundles of broadband, home phone, and either a mobile plan or Fetch. These bundles also include free or rental hardware and a security package. They also have a special Christmas bundle that includes broadband internet and phone, a smartphone, a mobile plan, and either $20 off the plan for the first 6 months or a digital photo frame.
- TGP offers bundles of home phone and broadband internet only.

Finally, the $38-billion National Broadband Network (NBN) is designed to increase competition within the Australian communications sector. A new company, NBN Co., will build and operate the next generation network, wholesaling the use its network to retail ISPs. Australia’s investment in the NBN is intended to reduce Telstra’s dominance of communications. Currently, the NBN is scheduled to be completed by June of 2021 according to the National Infrastructure Construction Schedule. By June 30, 2015, construction on the NBN should have at least commenced in over “1500 communities and 3.5 million premises throughout Australia.” For remote areas, the Interim Satellite Service (ISS) has already been launched, and a permanent satellite solution will be introduced in 2015. In some regional and remote areas a fixed wireless network is being deployed and is available currently in some areas with completion planned for 2015. Currently, 24,000 Australians are using the NBN and the NBN is on track to “having construction...

---


underway or completed for 758,000 homes and businesses by the end of the year.”\(^{103}\) Finally, Telstra and NBN have come to an agreement that the NBN can reuse suitable Telstra infrastructure. Telstra will also be “decommissioning its copper and broadband HFC networks during the NBN rollout.”\(^{104}\)

2. **Switching Costs in Internet Access Services by Type**

   **Contractual Costs:** Typically, customers buy Internet access services under contract, during the term of which there are significant switching costs. As noted above, those costs may be offset by ex ante competition for customers, in the form of introductory prices, subsidized content or other consideration. So long as customers compare the value of those ex ante offsets to the ex post or “life-cycle costs” during the contract, they can neutralize switching costs by making rational decisions about which supplier and which service plan. However, as the complexity of pricing schemes, and the number of services that are sold in bundles increases, it is becoming more difficult for customers to compare plans across ISPs, or even decide which plan of a given ISP is best suited to their usage and preferences. Thus, contractual switching costs can be exacerbated by search costs and uncertainty costs (finding the best supplier, comparing quality of service and pricing across suppliers). The larger these switching costs, the less likely it is that ex ante competition will generate offsetting benefits to consumers during a contract period, or even when it is up for renewal.

   **Transaction & Shopping Costs:** Contractual switching costs can be further compounded by the growing use of service bundles. There is clear evidence that many consumers prefer bundles of services, or even services bundled with content: they can reduce shopping costs (“one-stop shopping”) and transaction costs (e.g. consolidated billing), and often lower prices (i.e. the bundled price for three services is less than the sum of buying those three services separately). As noted in the Convergence Review, though:

   “bundling may generate competition concerns in... cases where access to premium content is dependent on the acquisition of other products, or where it reduces competition by leveraging market power from another market... Some ISPs provide unmetered content to customers who access specific internet services that they control, often based on a relationship the ISP has with a third-party content provider... Having access to unmetered content provides significant benefits to customers... However, the provision of unmetered content may also create competition concerns, where this practice is employed by dominant players in a market to keep out new entrants, or where customers of one ISP are allowed to access unmetered content from one particular content supplier.”\(^{105}\)

---


An econometric analysis by Prince and Greenstein empirically tested the proposition that bundling increases “switching costs by analyzing household-level choices for telecommunications services that are often packaged in a triple play: wired telephone, pay television (satellite or cable), and broadband Internet.” They found that bundling does in fact reduce churn for the three services in a triple-play bundle and noted several implications of their findings:

“First, they imply that bundling firms can earn higher margins on bundling customers than they otherwise would if bundling did not create switching costs. However, to the extent that households recognize the increased switching costs they impose, bundling firms may need to offer their bundles at especially low introductory prices. In addition, bundling may dissuade entry, as a significant proportion of customers are “locked in” to their service/provider choices through a bundle.”

“Beyond this, one may be concerned that switching costs create a barrier to entry. Specifically, incumbents have a cost advantage over potential entrants, and could exploit this to exclude entrants while still making positive profits.”

A recent study by the Federal Communications Commission found further evidence of the connection between bundling and churn. In a survey of over 3,000 adults, 39% of broadband users with a choice of Internet access provider said that “having to change their current bundle of Internet, TV, and phone service was a major reason for keeping service.” It seems nearly certain that the bundling of content with communications services will continue to grow, increasing switching costs causing concerns for competition and consumers. Therefore, in Section G, I will address policy initiatives that could address these concerns.

Search Costs: In any given locale, there is a fairly large number of ISPs from which to choose. Because consumers tend to have experience with only one (or, at most, a few ISPs), comparing and choosing an ISP can involve substantial search costs. Customers can and do use the search capabilities of the Internet to reduce search costs, especially “comparison shopping sites” that enable consumers to compare the service and price offerings of several ISPs in one place. However, using online services to reduce search costs does not entirely eliminate them, due to potentially very high uncertainty costs. Moreover, the interplay between these search costs and uncertainty costs are substantial and growing.

Uncertainty Costs: In searching and shopping for Internet access services, there is—for many consumers—growing uncertainty costs. These costs arise because customers are reluctant to change

107 Ibid., p. 30.
108 Ibid., p. 8.
from a supplier of known quantity and quality to one which is unknown. To a degree, these costs can be reduced by active competition among suppliers, which can offer free or low price trials, money-back guarantees, or other inducements. Firms can also use direct sales and advertising to increase awareness and compare their services to others:

“The use of such direct sales techniques can be interpreted as a strategy to overcome consumer’s search and switching costs. By approaching customers directly, the firms overcome the customers’ search costs and as the sales staff provide the customer with the contract forms and help them to fill those in, then they also reduce the customer’s transaction costs. In fact, as such direct sales are costly for the firms involved, the firms are in effect paying customer’s switching costs for them.” 111

However, even when firms “pay” or reduce customers’ search and uncertainty costs, there remains a very serious barrier to consumers making rational choices based on “life-cycle costs” when the service(s) they are considering are metered or capped.112 Many consumers do not know how much service they will buy over the life of the contract, or how their activities actually affect the quantities which determine the amount they will pay (e.g. how many Mb are used to download a video?). In other words, uncertainty switching costs are compounded by uncertainty about both prices and quantities. This is a serious and growing problem, worthy of public policy attention.

F. Switching Costs in Mobile Communications Services

1. The Australian Market for Mobile Communications Services

Since 2008, when Telstra turned off its CDMA network,113 Australian mobile telecommunications services operate on successive generations of GSM standards.114 The Australian market for retail mobile services is dominated by three large mobile network operators: Telstra, Optus and Vodafone Hutchison Australia (VHA), with market shares of 41%, 30% and 23%, respectively. The remaining 6% of the retail market are much smaller players, mobile virtual network operators (MVNO) and resellers, which purchase wholesale services and offer retail services to customers. These include “Macquarie Telecom, Dodo, TPG, People Telecom, AAPT, Comtel and TransACT, Woolworths, Amaysim and Lycamobile.” 115


112 Moreover, even if a consumer chooses an “unlimited” plan, they often need to compare the price of that service to alternative, metered plans.


Mobile contracts offered by the main mobile service providers in Australia are either pre-paid or post-paid. 116 In a post-paid “cap plan” contract, consumers will typically agree to pay a fixed amount per month for a set amount of services (e.g. minutes to be used on calls, a certain number of text messages, etc.). Should a consumer use more than their monthly limit, they will be charged extra for the additional services that they use. 117 In a pre-paid plan, there is no long-term contract that a consumer is locked into, and consumers only pay for as much credit as they need. However, consumers will need to use all of their credit within a certain time frame or they will lose the unused credit. 118

Providers typically incentivize customers to sign onto longer post-paid contracts by providing a free mobile device. For example, Telstra’s “Every Day Connect Small Plan” costs $50 per month with a minimum 12 month contract term if a customer brings their own phone. The same plan costs $67 per month, with a 24 month term, if the customer elects to receive a free Apple iPhone 5 (16 GB model). 119 Over the lifetime of the contract, the customer will pay an extra $408 by choosing the plan with the free device, which is a better deal than buying an iPhone 5 for approximately $630 and signing up for the no device version of the plan. 120

Another feature of the Australian mobile communications services industry is mobile number portability (MNP). Implemented on September 25, 2001, MNP enables mobile customers to keep their existing mobile phone number when switching between service providers. This policy applies not only to consumers on post-paid mobile contracts, but also to consumers on pre-paid mobile plans and consumers on post-paid plans who want to switch to a pre-paid plan. The only mobile services not currently covered by MNP are “satellite-only mobile services.” 121 In order to port their mobile number to a new provider, a consumer must first choose a new service provider and inform the provider that they wish to port their existing mobile number. Next, the new provider will contact the existing provider to confirm the consumer’s personal information and that they are in fact an authorized customer. During this time, the consumer may need to provide authorization for the

118 Ibid.
120 The reported full retail price for an iPhone 5 is $649 USD. Using an approximate exchange rate of 1 AUD = 1.03 USD, the price in AUD can be estimated as 649/1.03 = 630. See Beauchamp, M., “Full Retail Pricing for Unlocked iPhone 5 Revealed on Apple’s Website,” ZAGG, 13 Sep 2012, available at www.zagg.com/community/blog/full-retail-pricing-for-iphone-5-revealed-on-apples-website/.
changes and the new provider may run a credit check on the consumer. The actual porting itself generally takes “a couple of hours,” in most cases as “[t]he telecommunications industry has set up automated processes and electronic interchange between carriers to enable porting to take place in around the same time that it would normally take to provide you [the consumer] with a new mobile phone service.”  

Each of the three main players in the mobile services sector in Australia has had varying success in winning new customers and while reducing their own churn. Telstra, the largest player in the mobile services sector, has reported annual churn of approximately 12.2%. It has, however, also added “1.3 million new customers in the last 12 months.” Optus has reported winning only 400,000 new customers over the previous 12 months but has only experienced churn of 1.7%. Telstra also earns more on average per customer than Optus, reporting average revenue per unit of $65 compared to $60 at Optus. VHA, the smallest of the big three, actually reported losing 554,000 customers in 2011, 178,000 customers in the first half of 2012, and an estimated 154,000 customers between June and September of 2012. Blame has been placed on “[n]etwork reliability and customer service issues [that had] dogged Vodafone in 2010, 2011, and earlier this year.” The churn rate for post-paid contracts is highest for VHA, in the mid-20%’s.

2. **Switching Costs in Mobile Services by Type**

Compatibility Costs: In mobile services, compatibility costs depend mainly on carriers’ choices of wireless technology standard (e.g. GSM versus CDMA) and the choices of mobile device makers regarding those standards. In many countries, governments have chosen a single national standard; in others, there are competing standards (e.g. the United States). In case of the latter, users may face a high switching cost because, in order to switch from one carrier to another, they would have to buy a new device that is compatible with the new carrier’s network standard. The explosive growth of WiFi services has reduced the effects of compatibility costs because, irrespective of the mobile standard employed, users can connect WiFi enabled devices to the network. The growing use of

---


124 Ibid.

125 Ibid.


127 For example, nearly 90% of iPads sold have only WiFi connectivity, and only 6% of iPad-originated Internet sessions use 3G or 4G connections. http://www.imore.com/only-6-of-ipad-sessions-on-cell-networks-even-4g-ipads-spend-most-time-on-wi-fi.
Internet protocol (IP) for mobile data services dramatically reduces compatibility costs, as users can typically connect to any Website, via browser or app, from any device over a mobile network employing any standard.

**Contractual costs:** Often, mobile services are sold under contract of 12-24 months duration. During the term of the contract, switching costs can be quite high, due to early termination provisions or other penalties. Whether these switching costs are harmful to competition and consumer welfare depends on two key factors. First, is their sufficient ex ante competition among MSPs to “compete away” the potential gains from exploiting switching costs? Second, the extent to which customers can and do factor in “whole-life costs” into their choices. As we will see in discussing search and uncertainty switching costs, in many cases customers either do not consider whole-life uncertainty switching costs or, at a minimum, underestimate them. If so, ex ante competition among MSPs does not necessarily compete away the ex post gains of exploiting contract switching, reducing consumer welfare.

**Transaction & Shopping Costs:** When mobile services are bought under contract (postpaid), there are potentially significant switching costs during the term of the contract. Even when the contract is terminating, though, there can be “stickiness” in changing suppliers due to transactions switching costs. Fortunately, mobile numbers are “portable” across carriers, which significantly reduces switching costs. If, however, consumers store important data with their carrier (e.g. contact information), then the cost of moving that data to—or recreating it on—a new device or carrier can increase switching costs. Importantly, if consumers have purchased a bundle of services that either includes content, and/or a plan that charges different usage rates for carrier-bundled content, that can represent a significant switching cost of moving to an alternate carrier.

**Search Costs:** Although there is a smaller number of MSPs (than ISPs) from which to choose, there are significant search costs if a consumer wants to consider an alternative carrier. The quality of service among carriers—across locales, voice versus data, time of day—can vary dramatically. Customers can and do use the search capabilities of the Internet to reduce their search costs, especially “comparison shopping sites” that enable consumers to compare coverage areas, service qualities and price offerings of several MSPs in one place. However, using online services to reduce search costs does not entirely eliminate them, due to potentially very high uncertainty costs, which are increasing as consumers use mobile devices increasingly for Internet access and data services. It is one thing to have a reasonable estimate of the “minutes of calling” one expects to use, and compare voice calling plans accordingly. It is quite another, far more complicated proposition to estimate future messaging, voice calling and data usage, and compare carriers and their plans to find the combination that is best suited to that usage. The growing use of very data intensive mobile device usage further compounds this problem, as does the fact that mobile devices often “consume” data usage without the user’s active involvement—or even knowledge.
Uncertainty Costs: The discussion of search and uncertainty switching costs in Internet access services (Section E.2) noted their compounding effects. If anything, uncertainty switching costs in mobile services are even higher, as consumers must weigh their own usage characteristics—and how it will change over time—in order to make rational decisions about which carrier and which plan to choose, to prevent being “locked-in” to a contract that costs more than they anticipated, and more than an alternative carrier’s plan might have cost.

G. Policies to Reduce Switching Costs or Alleviate their Effects

As described in Sections E and F above, switching costs are a significant factor in assessing competitive dynamics in Internet access and mobile communications services. Although there is substantial ex ante competition within each of these industry segments—and, increasingly, across communications services—the nature of the switching costs involved makes it unlikely that ex ante competition alone is sufficient to ameliorate the potential harm to consumers that can be caused by those switching costs. If anything, the dynamics of these industries will further increase switching costs, due to uncertainty and search costs related to pricing and quantity of usage, differences between metered and unmetered content, and the bundling of services and services+content.

To a degree unimaginable just a decade ago, the widespread use of free Internet search and services enables consumers to reduce or moderate the effects of switching costs. The ability to search for alternate products and suppliers, compare service offerings and pricing have, in many markets, improved consumers bargaining position with actual and potential suppliers. The ability to buy products or services online gives consumers options they did not have in the “brick-and-mortar” world of retailing, banking, insurance and other services. Even when consumers do not actually make their purchases online, the very low switching cost of being able to do so translates into more competitive prices and better service quality. For example, Best Buy, a very large U.S. electronics retailer, recently announced that it would match online prices customers find while shopping in their stores.128 Best Buy is doing this because their own customer analysis showed that a growing number of customers were shopping in stores, but buying online (thereby turning retail stores into “showrooms”).

In addition to market responses to reducing or moderating the effects of switching costs, the best policy responses to these switching cost problems is to take steps to increase the availability and quality of information, to improve consumer awareness of the importance of factoring “life cycle costs” into contract or purchase decisions, and to provide legal protections from contractual abuses and remedies to reduce consumers’ transactions costs in dealing with service providers and problems that might arise therefrom.

Therefore, I commend Australia for having taken a major step in that direction. In 2012, the Communications Alliance developed a new Telecommunications Consumer Protections Industry Code (TCP) to supersede the version written in 2007. This new code was written to address the inadequacies of the previous code – specifically that “action was needed to improve customer satisfaction and thereby reduce customer complaint volumes.” According to the latest annual report from the Telecommunications Industry Ombudsman (TIO), about two-thirds of the complaints the group receives concern mobile services. Of these, the TIO currently finds “[c]omplaints about financial over-commitment caused by inadequate spend management tools” and complaints about “[d]isputed internet usage charges” to “be of particular concern.”

The new TCP addresses these issues by imposing new requirements on what information is provided to consumers and how it is presented. When the full TCP is phased in, mobile service providers can no longer use the term “cap” in advertising a plan unless consumers on the plan cannot actually exceed the limit imposed. Furthermore, when consumers purchase a new mobile service plan, they will need to be provided information on the charges for “a two-minute national call, a standard SMS and using 1MB of data.” Finally, mobile service providers must send consumers “usage notifications for data, voice and SMS” including “additional alerts when 100 per cent of a monthly allowance is exceeded.”

Beyond requiring more information to be given to consumers, the TCP also reforms requirements in the telecommunications industry related to billing, assisting consumers dealing with financial hardships, handling complaints, transferring suppliers, and monitoring of compliance. Changes made to benefit consumers include “increased obligations on suppliers concerning customers who experience financial hardship,” “tighter timeframes for complaint acknowledgement and resolution,” and “the creation of a strong new independent body... to monitor the performance of suppliers in complying with the Code.”

One potential method of reducing search and uncertainty costs is for the Government to develop and publish service quality standards or, at minimum, require that service providers regularly publish service quality information according to a set of standards. Standards for service quality are

134 Ibid.
critical because they enable consumers to make comparisons across service providers, reducing search and uncertainty costs, improving both ex ante and ex poste competition. While it is likely that independent third parties (e.g. comparison shopping sites) might be expected to publish such information, the Government could also publish key service quality comparisons to reward good service quality and promote investments in and expenditures on improving service quality, as recommended by the U.K.’s Office of Fair Trading:

“In some industries customers may be hindered from switching as it is difficult to find information about rival suppliers or because it is difficult to find information about which tariff or product is most appropriate for the customer’s particular needs. A package that is good value for a low use consumer may represent poor value for a high user.

In order to reduce the search cost, the authority should provide information on rival suppliers. This should extend to detailed information about products and tariffs to enable consumers to estimate which product is best for them.”

As a growing number of consumers sign term contracts to purchase Internet access, mobile and other communications services, the transactions cost of switching from one supplier to another can become an increasing source of friction or stickiness in these markets. While some of these transaction costs are inherent to term contracts, there may be a role of policies that inhibit firms from manipulating the terms of contracts to raise transactions costs as a barrier to switching suppliers. In particular, firms should be required to facilitate the transfer of a customer’s account from itself to another supplier without delay. If not mandatory, governments, can, at a minimum, promote the voluntary use of “best practice guidelines can limit the ability of firms to manipulate such costs.”

The government can also publish the names of companies who comply with those best practices and those who do not.

It is highly likely that the practice of bundling content with both Internet access and mobile services will play an increasingly significant role. While consumers may indeed benefit from the availability of bundles of services and content, bundling can increase switching costs and, therefore, has the potential for harm to competition and consumers. This is especially true if the “playing field” for content acquisition is tilted strongly in favor of the largest players, who can then use service+content bundles to disadvantage smaller players, who not have sufficient economies of scale to justify substantial content acquisition costs. If that happens, higher switching costs across bundled services could lead to increased industry concentration.

Finally, it is worth noting that policy initiatives to lower switching costs can benefit consumers in two different ways. First, if and when consumers are dissatisfied with the current supplier—or find a different supplier with better prices or service quality, they are more likely to make the switch.


136 Ibid., p. 122.
Second, policies that reduce switching costs can significantly improve consumers’ bargaining situation with their current supplier: the easier it is to change supplier—the lower are the switching costs of doing so—the more likely the current supplier is to charge competitive prices, offer higher service quality and treat its consumers fairly.