Yale SCHOOL *of* MANAGEMENT

Google (GOOG) November 29th, 2005

Initiating Coverage: Hold - Too risky to short, too uncertain to buy

Max Vontilla

Elle Dwight

Google is the world's leading search engine and online advertising firm. This year Google will power more than half of the searches conducted online and will attract almost 40% of domestic online ad spending to its proprietary and partner network. Though the company's strength is in search, Google offers more than a dozen diverse product lines, ranging from classifieds to email. With one of the most popular global brands and the most advanced computing platform on the planet, Google stands poised to dominate a host of sectors adjacent to search while continuing to lead online advertising firms.

"If opportunities arise that might cause us to sacrifice short term results but are in the best long term interest of our shareholders, we will take those opportunities. We will have the fortitude to do this. We would request that our shareholders take the long term view."

-Larry Page and Sergey Brin
(Google's 2004 IPO filing, p28)

Technology: Currently Google has more servers (over 110,000 by the latest estimate) and greater analytic resources than any other institution on the planet. The company's ability to attract top-tier computer science talent and spend unparalleled amounts on technical infrastructure underpins Google's distant lead in search and distributed computing technologies. Google's technical edge represents the largest barrier to competition in an industry where market share follows the best mousetrap and switching costs for searchers approach zero.

Business Model: Google's market driven pricing and low cost services provision give the company a sustainable advantage in an industry where scale is necessary to both provide the highest quality results and attract advertisers. Google's superior ad targeting allows the company to achieve the highest CPM rates among its peers while affording users a superior service. Meanwhile, its automated approach (with respect to search results and advertising) allows the company to expand faster and deeper than its peers (i.e. 100+ languages and countries compared to 25 for Yahoo!).

Brand: Google is currently the most recognized brand in Europe and consistently in the top five brands worldwide. A verb in its own right, Google has among the most loyal user base of any site online as measured by churn and consistency of use. The company's constant focus on the user experience and providing free services positions Google to expand its footprint while continuing to dominate the current oligopoly market for search advertising.

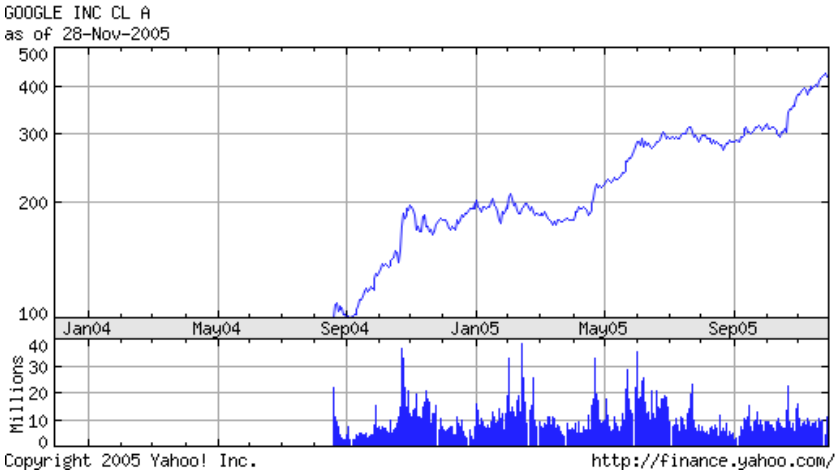
Management: Google's dual-vote structure and concentration of control in the hands of the company's two founders and its CEO give the company enduring stability and unlock significant growth opportunities. Google's shares may be more volatile in the short run because the company does not provide guidance or concentrate on quarterly results. Still, Google's long-term focus should allow the company to expand into huge untapped markets from classifieds to content on demand to internet telephony.

Price: Given the company's record breaking growth, premier engineering talent, and first-rate management, we expect Google's stellar profitability and expansion to continue. At the same time we do not see significant upside to today's price unless Google manages to

Key Statistics	
Stock Price	$403.54
Shares Outstanding (Fully Diluted)	296,984,000
Market Capitalization	$119,844,923,360
Net Debt	-$7,974,100,000
Enterprise Value	$111,870,823,360
P/E (ttm)	89.40x
Forward P/E (2006 est. Earnings)	53.81x
PEG Ratio (5 year growth)	2.76x
EV/EBITDA	50.05x
52 Week Range	$168.47 - $431.24
Analyst Consesus Target	$393.05
DCF Valuation	$389.47
Estimated Valuation Range	$340.07 - $481.60
Average Volume (3 Months)	8,647,160
% Held by Insiders	35.11%
% Held by Institutions	37.90%
Short % of Float (as at Oct. 11)	2.50%

derive significant profits from yet unproven business lines. Though we believe there is long-term justification for the current share price and discern short term support from probable inclusion in the S&P 500 and what will likely be a record-setting upcoming Q4, we do not find sufficient potential above today's price (i.e. >10% expected appreciation) to justify a buy rating.

In the medium term, we believe the company's potential to tap new markets offsets the risks from competition and susceptibility to a cyclical overall advertising market. Supported by our DCF valuation and analyst consensus estimates, we recommend a hold. Still, if in the next year or two Google manages to garner more than 5% of total revenues from arenas beyond search while maintaining its traditional dominance, look to the shares to approach that $500 mark.



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Google's Character and Strengths:

Most people know Google for its Internet search site and the Google Ads that appear on hundreds of thousands of Websites across Google's affiliate network. Indeed, as of 2005 almost 99% of Google's revenues derive from those most lucrative divisions of Google Inc. However, Google defines itself more broadly than search site and advertising agency and the company is developing dozens of other Web tools centered on information collection. Google calls itself "a global technology leader focused on improving the way people connect with information."[1] Analysis of the company's technology platform and existing portfolio of planned and launched products highlights the company's strong competitive advantage and potential to expand well beyond search.

> Hidden behind its simple white pages, Google has already created what it says is one of the most sophisticated artificial intelligence systems ever built. In a fraction of a second, it can evaluate millions of variables about its users and advertisers, correlate them with its potential database of billions of ads and deliver the message to which each user is most likely to respond.[2]

To understand Google one has to start with the company's search engine, which is used well over 100 million times on a typical day.[3] When an Internet user types in a word or phrase into Google's search bar, Google pulls up as many Web pages that name that word or phrase. If it's a common word, though, there could be thousands or millions of pages that mention it, and so the ordering of the results proves important. Google's ordering algorithm lists the relevant sites based on a formula of how many other people who are interested in that particular phrase go to a given site or link to it from a different site. For example, if

[1] Google's Corporate Profile on its Investor Relation's page. See http://investor.google.com/
[2] Hansell, Saul. "Your Ads Here (All of Them)." *The New York Times.* October 30, 2005.
[3] Stross, Randall. "How Google Tamed Ads on the Wild, Wild Web." *The New York Times*. November 20, 2005.

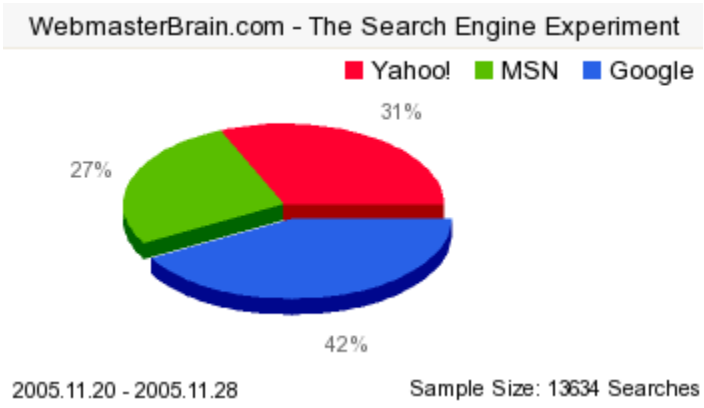
thousands of Web pages link to a single page because it is about a particular topic, then Google will pull it up higher when an Internet user searches for that topic.

What set Google apart from other early search engines was that Google built its algorithm so that the order of results was driven by Internet users' activity and objective 3rd party measures and not by advertiser payments or subjective cues. Google's fully automated approach resulted in the most relevant results and helped the company to build a dedicated following and world-wide brand recognition. By many people today, searching on the Internet is simply called "Googling." In addition Google's fully automated approach allowed it to scale with the web and build a computing platform that drives unparalleled performance at a fraction of the cost per user served.

In the process of gaining leadership in search, Google benefited largely from the lack of focus by other major players on search. Because search was not seen as a major money maker, Yahoo! and Microsoft were content to license Google's technology rather than building their own search engines while the web grew. Thus for a period of almost three years from 1999 until 2002, Google powered more than 80% of all the searches done online. As a result, as content on the web increased almost 100 fold over that period, webmasters increasingly focused on Google alone in designing websites to rank highly in searches and attract users. As such, a huge amount of time by millions of individual website owners and designers was spent focusing on optimizing sites to be analyzed by Google's specific search algorithms. The result was that Google was able to increase the relevance of its searches because millions of distributed websites had effectively been designed to be best assessed by Google alone.

Though individual search users can switch to a new search engine with little more than a few seconds of typing, it is far more difficult for a webmaster to redesign an entire

website to cater to the proprietary analysis performed by a search engine other than Google. Together with the technical edge that Google was able to gain on its competition during the years when it invested licensing revenues into its own unchallenged platform, Google's vast webmaster following underpins its superior results. Precisely because Google operates in an industry with low switching costs, where only players of a certain size can index the web and serve users distributed geographically for free, relevance is king. As affirmed by Google's growing market share, the chart below shows Google's lead in relevance as determined by an ongoing blind test of results served up by the three leading search engines.



While Google continues to outspend its competitors on search related cap-ex and R&D by a factor of 2 to 1, attract the most respected names in computer science, and command a following among the majority of webmasters – Google's edge in providing relevant search results should reliably persist. Furthermore, as webmasters continue to flock to the search platform that attracts the most searchers, Google's leading position confers a natural monopoly of sorts. It is thus of little wonder that Google continues to gain market share each quarter despite intensifying competition. Furthermore it is unlikely that the next paradigm shift in search will come from an unforeseen smaller player since only a short list

of entities can afford the computing power critical to perform searches across the World Wide Web. In contrast, Google is in pole position to leverage its superior technical platform to innovate and extend its dominance in the single arena where it expends 70 to 90% of its human, technical, and capital resources. Furthermore, Google's 20% rule (all engineers spend one day a week on projects of their own design) effectively decentralizes R&D and the company's internal funding processes overcome the technology adoption problems that might otherwise stifle innovation and the furtherance of disruptive technologies.

Though Google's expertise is in technology and its mission centers on reliable search results, Google does not make money directly from Internet searchers. Like other media companies, Google sells access to the users across its proprietary and partner networks to advertisers. Google currently generates money by auctioning off search terms to advertisers and by serving as an intermediary between advertisers and Websites that run Google text and display ads. Google AdWords are bought on Google's search site through a Dutch auction and placed on the right side of the page alongside the algorithm-produced search results. Google AdWord buyers pay Google only when their ads are clicked on. Google AdSense ads are those ads that Google places on non-Google Web sites. With AdSense, Google serves as an intermediary, linking Web writers and publishers of all sizes with companies who are advertising products that are similar to the content of that page. Those companies pay Google when their ads are clicked on, and Google gives a share (around 75%) of that revenue to the host Webpage.

The underlying advertising theory behind both Google AdWords and Google AdSense is that advertisements should be relevant or in someway related to the content on the page. In the case of AdWords, the advertisements are related to the search phrase and search results the Internet user seeks. In the case of AdSense, the advertisements are related

to the content of the writing on the page in which the ads are set. This relevance theory is actually a break with traditional print advertising theory, which says that, though advertisers may seek a particular demographic, they cannot have any knowledge of what the articles next to their ads will say. In fact, in most print media, it is seen as bias to run an ad for, say, a bank next to an article on a bank. That said, Google has turned that theory on its head and has found that Internet users are more bound to click on ads if they are related to the content the Internet users are seeking or reading.

Google's advertising approach is ground breaking in that it consistently delivers higher ROI (Return on Investment – i.e. profits from resultant sales exceeding the cost of an ad) to advertisers while giving users superior access to the information contained in advertisements. In addition, Google's automation of both the display and sale of advertising allows the company to lower costs and improves user response to ads. At the same time, Google's approach extends its pool of potential customers to small and medium advertisers who can for the first time afford the self service advertising solution that Google provides.

As we noted at length in our industry report, online advertising is growing as more and more advertisers shift their ad budgets online. Analysts continue to forecast online ad spending to grow to upwards of $16 billion in the next four years.[4] We believe Google will grab an increasing share of online advertising even as the dollar amount spent grows. If Google matches its third quarter performance, the company would attract upwards of 40% of the spending across the entire domestic online market this year.[5] In our opinion, Google will capture an increased share of the larger future online pie via an extended partner network and continuing innovations in the arenas discussed below.

[4] Bilefsky, Dan. "Yahoo Tightens Control in Europe and Asia." *The International Herald Tribune*. November 8, 2005.
[5] www.fool.com/news/commentary/2005/commentary05112304.htm

Overall, Google has undergone phenomenal growth in employees, products, and market capitalization, as its stock soared from its IPO value of $85 in August of 2004 to a highs above $400 this month. Its market cap is now around $120 billion, eclipsing Yahoo!, eBay, and even Cisco while approaching Intel and the 800-pound Gorilla in the overall technology space: Microsoft. While Google's market capitalization is stratospheric, we believe the company's growth prospects in search justify the current price. The markets that Google has entered are enormous offline and Google is prepared to continue dominating them as they move increasingly online. Furthermore, when we consider search as essentially an oligopoly market where Google has a commanding lead in terms of following, focus, and resources – we do not believe Google faces sufficient competitive risks to warrant a sell recommendation.

Though competition (especially from 3rd place Microsoft) should not be ignored, we view offsetting valuation support from Google's yet untapped potential to dominate new markets, particularly directories ($50+ billion in 2005 sales) and classifieds ($100+ billion in 2005 sales). As Google continues to spend upwards of 30% of its human and capital resources on products other than search (including 10% of resources on products explicitly having no bearing on search), we see cause to gross up our DCF valuation by as much as 10 to 30%. Look to our sensitivity analysis following our valuation for detail on implied share prices approaching $500. As the increasing scope of the web and advances in artificial intelligence unlock yet unforeseen applications, we see Google as having unmatched potential to capitalize on huge new revenue streams. In this context, we see a potentially large downside to shorting the stock for example. Conversely, we believe Google might provide an excellent medium to gamble a fraction of a well diversified portfolio on a lasting

technology bet as Google continues to "fund projects that have a 10% chance of earning a billion dollars over the long term."[6]

Growth Opportunities for Google:

Besides search, intermediary ad placement, and lead generation, Google has developed technologies to compete in many other markets, including directory services, book viewing/sales, classified advertising, maps, advertising analytics, television, subscription services, e-mail, payment provision, pay-for-content, and wireless Internet access. In addition, Google is expanding all of its services overseas.

Directory Services – companies like YellowPages traditionally provided phone numbers and addresses in printed phone books, but they have moved online in recent years and they provide listings for free. These companies make money based on paid inclusion advertisements on their sites and in their publications. Google, however, is currently entering this area with arguably more useful information than phone listings. The company announced last week that it is producing a local version of its Froogle Web site, which currently is a national shopping comparison site. By using Froogle on the local scale, shoppers can look for the cheapest version of a product in their town on Google. Why go to YellowPages ($10+ billion in 2005 US ad sales alone) to call and ask for a price, when that information is collated on Google's local Froogle? Indeed, retail analysts are saying the local Froogle will threaten traditional phone directories. Marshal Cohen, chief retail analyst at NPD Group said those traditional directories are a "one-dimensional advertising method" that would likely

[6] Larry Page and Sergey Brin's letter to shareholders, 2004 Google IPO filing, p.28

become outdated next to local Froogle. Yahoo!, though, is also entering this area. Yahoo's site shopping.yahoo.com has some local functionality.[7]

Book digitizing – though controversial, Google is involved in a project to digitize all of the books in several large research libraries, including Harvard, the Library of Congress, and the University of Michigan. Google has not said how much money it is spending on the project, but the media has speculated it is costing about $200 million. All these books online will also simply add more terrain for Google's search engines to search. The book digitizing project is important because it demonstrates the unique position that Google currently enjoys. Very few companies today – and certainly few government entities – are in the cash rich and flexible position that Google occupies. Google has the resources to pull off what others might say is impossible. For example, about a year ago, the university librarian at the University of Michigan reportedly asked his staff to predict the length of time it would take to digitize all of the library's 7 million books. The staff told him it would take more than 1,000 years. Google is planning to complete the project in six years.[8] By creating a completely new product – millions of books digitized online, Google may be able to create new value that can be monetized either by showing contextual ads alongside pages or through pay-for-content models.

Classified advertising – Google recently launched Google Base, a site that allows anyone to upload anything for free and then helps Internet users search through the posts. Google Base's most obvious use is classified advertising – an industry that is estimated to

[7] Markoff, John and Barbaro, Michael. "Google's Shopping Service to List User's Local Stores." *The New York Times*. November 22, 2005.
[8] Hafner, Katie. "At Harvard: A Man, A Plan, and A Scanner." *The New York Times*. November 21, 2005.

generate about $100 billion a year in sales.[9] Google is simply ahead of the traditional classified advertising companies, who have moved online only slowly. As Peter M. Zollman, publisher of Classified Intelligence Report wrote recently: "It's very clear that Google is planning to launch a classified advertising product…It will be a huge threat to traditional classified businesses." Two weeks ago, Zollman's newsletter said that Google filed a patent application in March 2004 for a service it would call "Automat." The patent included the URL address "classifieds.google.com."[10] Google has said little about its steps into classified advertising, but we believe the company will be attracting a growing piece of the $100 billion spent on classified advertising within the near future, and likely even enlarging the classified market. Already traffic to online classifieds sites has been increasing at more than 100% per year since 2000, with Craigslist alone receiving more than 10 million unique monthly visitors. Furthermore, Google base represents an opportunity for the company to go way past classifieds, to create its own web within a web on a platform where all content will be displayed alongside contextual Google ads.

Google Maps – Google acquired online map-maker Keyhole.com last spring, as it further expanded into the map area. Google now competes with Yahoo!'s map service as well as Time Warner's Mapquest.com. Google Maps online provides pictorial maps while Google Earth provides actual photographs of anyplace in the world. Users literally zoom in on the globe where they want to see the photo. Maps are another great venue for posting local advertising. When someone searches for an address, Google could conceivably post ads for

[9] Carr, David. "Woodward? Google? A Plague Week." *The New York Times*. November 21, 2005.
[10] Markoff, John. "Google Aims for the Classified Ad Business." *The New York Times*. November 16, 2005.

nearby companies. The market for local online advertising was about $700 million in 2004 and is forecast to reach $5.1 billion by 2009.[11]

Google executives have said the maps, which do not now have significant number of ads, may display a wide array of ads in the future. Google has also been trying to convince software makers to create Websites and other online programs using Google Maps and other Google products. This is an important part of the online war today, which commentators are calling Web 2.0. Google, eBay, Yahoo!, and Microsoft alike are employing the Web 2.0 strategy – i.e.: trying to entrench their designs by getting enough online developers to build their sites to fit those designs. [12] Also, this month, Google introduced Google Local, which gives cell phone users Google maps on their phones. As a testament to Google's superior execution, within 3 months of launch, Google maps had already matched longstanding Yahoo! Maps in unique visitors and today the site is second only to MapQuest, less than six months from being unveiled.[13]

Advertising Analytics - Google has just announced plans for Google Analytics, which will be a set of free analytical tools designed to help advertisers and Web publishers figure out how their Websites and ads are performing. Using Google Analytics, designers will be able to see what search prompts led people to their sites or their ads, for example. Currently, Web analytics (many sites and marketers pay companies, such as WebTrends and Yahoo!'s Overture, to analyze their Web traffic) represent a $460 million per year industry, with significant room for growth. Less than 20 percent of the quarter of a million companies that have more than $1 million in revenue each year and a Website use any analytical service.

[11] Gaither, Chris. "Google Trying to Put It All On the Map." *Los Angeles Times*. February 9, 2005.
[12] Darlin, Damon. "EBay Expected to End Fees for Third-Party Developers." *The New York Times*. November 14, 2005.
[13] Source: ComScore Networks as presented in PiperJaffray's Google Company Note, 17 November 2005

Google, of course, also has something to gain by performing these analytics for Websites as access to publishers and advertisers' data could help Google understand Internet traffic even better. [14] Furthermore the company believes that since it offers advertisers the highest ROI of any advertising medium, conferring transparency on the advertising process through superior analytics should help Google attract advertisers and gain market share.

Television – Google has said very little about plans to move into television, but as more shows are viewed online, this may be a natural shift. In addition, a logical step for Google is to begin offering brand advertising campaigns – campaigns that are based on gaining brand recognition rather than just click-throughs to a site. Since brand recognition ads function without click-throughs, these ads are priced based on image views rather than click throughs. They are the sort of ads traditionally in television advertising and largely untapped in terms of targeting and contextualization. As Eric E. Schmidt, Google's chief executive, said recently: "If we can figure out a way to improve the quality of ads on television with ads that have real value for end-users, we should do it." As an example, he said, when he is watching television, "Why do I see women's clothing ads?" he said. "Why don't I see just men's clothing ads?"[15] Google's appointment to its Board of Directors this week of Ann Mather, a Pixar and Disney veteran with media connections to Apple's Steve Jobs among other heavyweights, should confirm Google's conviction to enter the wider media display advertising market and potentially the pay-for-content media market as well.

Subscriptions services – Yahoo! has dropped out of the bidding for Time

[14] Tedeschi, Bob. "The Trail of a Clicked-On Ad, Brought to You by Google." *The New York Times*. November 14, 2005.
[15] Hansell, Saul. "Your Ads Here (All of Them)." *The New York Times.* October 30, 2005.

Warner's AOL site, but Google and Microsoft are rumored to remain as interested parties. [16] Ownership of AOL would give Google a registered user base, which would open more opportunities for subscription services for users. One of Google's current weaknesses, it can be argued, is a lack of connection with users. Users do not have to register to use most of Google's services and Google does not have credit card numbers saved so that it can easily bill users if they want to accept a premium service. Google has already started to register users by providing them e-mail with its new Gmail service, but an AOL acquisition would further this process. The acquisition or purchase of a minority stake would also secure Google's largest advertising partner (AOL represented 8% of Google's total revenues in Q3 2005, down from 14% last year) and grant access to a treasure trove of Time Warner and HBO media content.

E-mail – Google's new Gmail service includes a completely new venue for advertising. Google is the first e-mail provider to run targeted ads alongside people's e-mail. Google may be able to generate new large revenues by placing ads that are relevant to the e-mail messages as its user base inevitably grows.

Payment Provision – Google has announced plans to develop a new online payment platform. The company has suggested that this offering, GoogleWallet, will be geared towards paying for content and services online rather than targeted towards purchasing offline goods and services through the web. Should Google manage to tap into the hundreds of billions of dollars spent worldwide on e-commerce, the company could build a commission stream worth billions in its own right.

[16] "Yahoo! Won't Seek an AOL Deal." *Bloomberg News*. November 11, 2005.

Wireless Internet – Google is currently working on a project to provide free wireless Internet throughout the city of San Francisco and has already secured a contract to provide free access to Mountain View. The company is also testing free access stations in Heathrow and hotspots in San Francisco and New York. Local wireless access provision presents a gateway into the local advertising market, which is estimated to grow to $5.1 billion over the next three years. Together with Google's local offering, its proprietary payment platform, and its rumored gbrowser (in collaboration with Mozilla) – a wireless Google platform available in major urban areas throughout the US and the world could provide Google with a killer application. Imagine sitting in a park and being able to find the nearest store with a particular book on sale and paying for it before you get there. Imagine advertisers lining up to reach motorists browsing for lodging while speeding down I-95 into New York. At that point, it is not hard to imagine that Google's service to local advertisers and users, empowered by increasingly mobile devises, would truly outpace rival offers.

Overseas expansion – Online ad spend is growing around the world. In Europe, Jupiter Research says, money spent online should double from about 3.2 billion euros in 2005 to 6.5 billion euros in 2010. Google is thought to have the largest following worldwide, ahead of Yahoo!, specifically because it could quickly expand the language functionality of its search engine as the company's indexing and translation processes are almost entirely automated. Google has also partnered with local Internet companies around the world rather than dispersing its own employees abroad, which has made worldwide growth more rapid. In Germany, for example, Google had 18 million users in October while Yahoo! had only 5.4

million and the company has functioning websites in over 100 countries compared to Yahoo!'s 25.[17]

Other opportunities – Google has dozens of unnamed projects under the works (from an online software partnership with Sun to an open source partnership with Red Hat) and its executives often make statements about new usages to come for current projects. For example, Salar Kamangar, Google's vice president for product management, said this month that Google Base may be used in much wider ways than simply classified advertising.[18] At the same time, though we do not envision Google undertaking any of the following actions in the near future out of potential conflict with the company's "do no evil" policy, we highlight that Google sits on the following huge potential revenue streams which it could tap if ever the need arose:

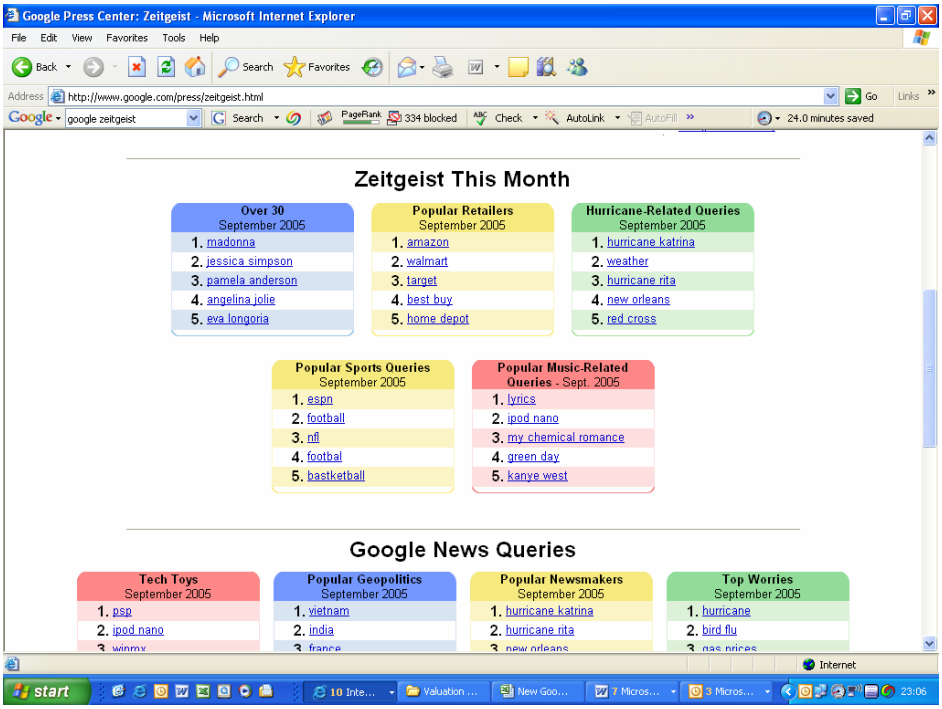
- Home page display ads – Currently AOL and Yahoo!, sites with similar traffic to Google.com, charge roughly $1 million per day for each of the main banner ads that feature on their home page. If Google placed two such ads on its home page, the company could earn annually upwards of $750 billion in extremely high margin incremental revenue. At Google's current P/E ratio, the implied extra earnings would be worth approximately $50 a share.

- Charging for services – Currently Google 6 million registered users to sites such as gmail, orkut, or Google Groups. Total registered users are expected to reach close to

[17] Bilefsky, Dan. "Yahoo Tightens Control in Europe and Asia." *The International Herald Tribune*. November 8, 2005.
[18] Markoff, John. "Google Aims for the Classified Ad Business." *The New York Times*. November 16, 2005.

50 million by 2014. If Google were to collect just $1 per month on average from these users (increasingly possible as people adopted Google Wallet), the company could earn as much as an additional $600 million in annual revenues by 2014. Assuming the 33.4% FCF margin implied by our DCF valuation, this would add upwards of $10 per share to our valuation.

- Market Research Data – Currently Google collects perhaps the most complete and advanced analytics on consumer behavior, purchasing interest, and market trends throughout the globe. Were Google to sell or otherwise leverage internally this proprietary data, applications could be worth billions. One could easily imagine companies lining up to pay millions in annual subscriptions to get real-time customized data along the lines of what Google showcases at http://www.google.com/press/zeitgeist.html.



Risks

Google, of course, faces risks. Top among them are potential privacy issues, a decline in the public perception of the company, lawsuits concerning copyright infringement or other concerns, government regulation, competition, or failure to grow an advertiser base to include the majority of large advertisers.

Public perception - Google currently has a great brand name and massive public support. It is possible, though, that the public could come to view the company more skeptically, particularly as the company grows. As a Google executive told John Battelle off-the-record in Mr. Battelle's new book *The Search*: We're one bad story away from being seen as Big Brother."[19] Another new book on Google concludes with co-founder Sergey Brin saying: "Why not improve the brain? … Perhaps in the future, we can attach a little version of Google that you just plug into your brain."[20] Certainly, Google could start to seem intrusive to people and may be viewed negatively, as Microsoft became hated and feared as it grew. (That said, Microsoft is still making significant money.)

Users may also raise increasing privacy concerns. Currently, Google says it only uses the cookie identification of computers that visit its site and that it knows no other information about people who search on Google. But, as Google expands its services into areas discussed above, the company may gain more information about Web users. Lauren Weinstein, the founder of the Privacy Forum, told a reporter recently, "If you start to target people based on a corpus of data, it can be abused in various ways internally and externally by organizations and government agencies," referring to court orders the government can get to view e-mails

[19] Battelle, John. *The Search: How Google and Its Rivals Rewrote the Rules of Business and Transformed Our Culture.* 2005.
[20] Vise, David A. and Malseed, Mark. *The Google Story.* The Delacorte Press. 2005.

or other messages people post on Internet services.[21] Google Earth, with its ready depository of photos around the world, also poses privacy and potentially security concerns.

Lawsuits – Google is currently being sued by the Association of American Publishers and the Authors Guild over its Book Search program. The groups say that posting books for free online represents copyright infringement. It is unclear how this case will come out. Unlike the case of posting new songs online, these book publishers may have a hard time showing that they are losing revenues when Google posts what are largely very old, out-of-print books online.

Regulation – Google may face greater regulation within the United States or from Global forces over the next years. The bigger Google gets, the more antitrust issues may arise. In addition, there is a growing outcry around the world for international regulation of the web in general. The World Summit on the Information Society, a group involving the United Nations and nearly every government from around the world, met in Tunis a few weeks ago and adapted new resolutions to work towards involving all national governments in Internet regulation and oversight. The group's stated goals include fostering broader Internet access and fighting spam. Their progress seems to be slow-moving and it is unclear what they would do that might hamper Google. Still, they may produce regulation that could limit Google's business expansion or otherwise hamper the company.[22] Already a few governments have raised questions about the Internet and Google. The French government

[21] Hansell, Saul. "Your Ads Here (All of Them)." *The New York Times.* October 30, 2005.
[22] See this site for more info: http://www.itu.int/wsis/newsroom/press_releases/wsis/2005/18nov.html

for example blamed blogs for partial cause of the recent riots there[23] and the government of India has complained that Google Earth raises national security concerns.

Competition – Google's main competitors are Yahoo!, Time Warner's AOL, EBay, Amazon, and Microsoft. All of these companies are currently competing with Google and/or creating products to compete in one of the areas Google has entered. For example, Yahoo! is currently purchasing full ownership of international units that it partially owns so that it can better compete with Google overseas. Also, Yahoo! has partnered with SBC (now renamed AT&T) to provide mobile phone Internet content, including maps, email, news, etc. Amazon is currently developing its own online book reading system and Microsoft just announced its plan to offer Windows Live and Office Live, potential online competitors to Google. Also, just after Google launched Google Earth, Microsoft released MSN Virtual Earth.

Failure to Convert Large Advertisers to the Google Model – As discussed above, Google's advertising model is a break from traditional offline advertising. Some large advertisers have said Google is controlling and less open to their ways of doing things. "Google is very opaque and bizarre to deal with," said Joshua Stylman, a managing partner at Reprise Media, a search advertising agency. Large companies often want more say than Google gives advertisers on where and when their ads run. Google replies by saying it shouldn't matter how Google runs their ads as long as the advertisers make more money back than they spend on the ad.[24] Google's current base of advertisers is largely small and midsize companies. The largest companies have not fully moved online and Google cannot grow as

[23] Crampton, Thomas. "French Police Fear That Blogs Helped Incite the Rioting." *The International Herald Tribune*.. November 10, 2005.
[24] Hansell, Saul. "Your Ads Here (All of Them)." *The New York Times.* October 30, 2005.

much as it hopes to if they do not move online or if they move online with rivals. We think, however, a significant share will pick Google and that Google's new free analytic package will be a major selling point with reluctant advertisers, large and small.

Valuation

We base our valuation on a DCF projection rather than relying on forward multiples and short term EBITDA or earnings forecasts. As Google does not have any material debt position, either the WACC or APV method should yield the same results. To build our model, we have taken into account Google's past and projected growth as well as expectations for the size of the future online ad market and overall Internet penetration levels. Throughout our revenue projections we include lines of information to serve as a sanity check for our model as well as to anchor our growth estimates.

Surprisingly our bottom up valuation yielded a price very similar to the current market level, our target price of $390 being within 5% of the last close of $404. To reach this valuation, we have made a number of rather ambitious assumptions that we believe are defensible in light of Google's track record and its leading position, especially internationally. The following are the chief points of progress to note over the 10 year period from 2005 to 2014:

- Google's reach among the larger Internet penetration increases by 5% points from 17.4% to 22.8% while overall Internet penetration increases from 16.2% to 24.0% of the global population.

- The percentage of pages viewed by domestic users that carry pay per click advertisements increases from 31.1% to 48.3% driving an increase in Google's effective CPM rate across its network from $20.81 to $45.18.

- The percentage of the entire estimated US online advertising market held by Google's proprietary network of sites increases from 14.1% to 22.4%.

- The percentage of revenues coming from US operations declines from 60.5% to 46.0% in light of almost two thirds of Google traffic coming from abroad.

- We assume the loss of AOL's contributed revenues, either as a result of Microsoft acquiring AOL or Google having to pay to keep these revenues through a defensive deal.

- We assume a modest decrease in all cost lines except for R&D (in terms of relative percentages of net revenue) and provision for Google's stated intention to donate 1% of future profits, resulting in flat FCF margins around 36%.

- We do not assume significant revenues from any new lines of business. Rather we consider the valuation impact of additional profit streams in our Sensitivity Analysis.

Summary DCF and Assumptions

Valuation Summary

Total NPV as at 11/29/05 (excl. Terminal Value)	30,032.2
NPV of Terminal Value (at 4.5% growth)	77,667.0
Cash, Equivalents, and Equity	7,974.1
Less Debt and Minority Interests	- 6.4
Implied Equity Value	115,666.9

# of Fully Diluted Shares	297.0

Equity Value per Share (in dollars)	**$389.47**

Intermediate WACC		11.81%	Terminal WACC	10.36%	Terminal Growth	4.5%
	Rf	4.40%	Rf	4.40%		
	(Rm - Rf)	5.00%	(Rm - Rf)	5.00%		
	Beta	1.49	Beta	1.20		

Notes and Assumptions:

Google cash taxes from operations have been estimated using Morgan Stanley Analysis
We have calculated our Intermediate WACC using a Beta of 1.5. This Beta was estimated by increasing Yahoo!'s beta of 1.35 by 10% to reflect Google's less diversified revenue base
We have applied a Beta of 1.2 to calculate Terminal WACC as volatility should be dampened as Google assumes growth in line with the overall economy
We have used a 4.5% growth rate in the Terminal period as we believe that Google should benefit from global long term growth rates above 4.5% dampened by a 3-3.5% long-term domestic rate
We use a value of 5% for the market risk premium as we believe this is conservative compared to forward estimates of a premium as low as 4% in light of historical premiums of 7%+
We have calculated the Cash, Equivalents, and Equity Value for Google taking last available figures as of Q3 2005 and adjusting for interim cash accumulated

Group Revenue Model

(in millions unless otherwise stated)

	2002A	2003A	2004A	2005E	2006E	2007E	2008E	2009E	2010E	2011E	2012E	2013E	2014E
Total Unique Google Users per day	36.0	80.6	134.6	182.6	206.4	231.1	256.6	282.2	307.6	329.2	348.9	366.4	381.0
Total Worldwide Internet Users	590.0	762.3	934.5	1,051.1	1,145.7	1,237.4	1,324.0	1,403.4	1,473.6	1,532.5	1,578.5	1,625.9	1,674.6
Implied Google Reach per day	6.1%	10.6%	14.4%	17.4%	18.0%	18.7%	19.4%	20.1%	20.9%	21.5%	22.1%	22.5%	22.8%
Total Population	6,346.5	6,397.2	6,448.4	6,500.0	6,552.0	6,604.4	6,657.3	6,710.5	6,764.2	6,818.3	6,872.9	6,927.8	6,983.3
Implied % of Population Online	9.3%	11.9%	14.5%	16.2%	17.5%	18.7%	19.9%	20.9%	21.8%	22.5%	23.0%	23.5%	24.0%
Total Registered Google Users	-	-	2.4	6.1	11.5	17.3	22.9	28.7	34.4	39.6	43.5	46.8	49.1
Average Page Views per User (in units)		4.2	4.6	5.2	5.5	5.6	5.7	5.9	6.1	6.2	6.3	6.4	6.5
Total Page Views per Day		338.7	619.0	949.7	1,135.1	1,284.0	1,468.0	1,663.3	1,867.3	2,038.0	2,203.5	2,359.9	2,478.9
% of Page Views in US			33.3%	34.0%	34.4%	34.6%	34.9%	35.5%	36.2%	36.7%	37.1%	37.4%	37.6%
% of US Pages Viewed with Paid Ads				31.1%	32.7%	34.3%	36.0%	37.9%	39.7%	41.7%	43.8%	46.0%	48.3%
% of US Pages with Ads Resulting in a Paid Click				25.6%	26.1%	26.6%	27.2%	27.7%	28.0%	28.3%	28.5%	28.8%	29.1%
Average Collected Revenue per Click (in $)			0.24	0.26	0.27	0.28	0.29	0.29	0.30	0.31	0.31	0.32	0.32
Implied Average US CPM (in $)				20.81	22.95	25.32	27.93	30.81	33.33	36.05	39.00	42.18	45.18
Total US Google Network Ad Revenues	**238.5**	**562.5**	**1,058.3**	**1,906.1**	**2,880.1**	**3,707.9**	**4,699.4**	**5,985.3**	**7,446.5**	**9,048.3**	**10,752.6**	**12,613.7**	**14,395.1**
Estimated US Advertising Market Size	329,315.0	339,500.0	350,000.0	360,500.0	371,315.0	382,454.5	393,928.1	405,745.9	417,918.3	430,455.9	443,369.5	456,670.6	470,370.7
% of Advertising expected to be online	1.8%	2.3%	2.9%	3.7%	4.5%	5.4%	6.5%	7.8%	9.3%	10.3%	11.3%	12.4%	13.6%
Implied % of Online Advertising Market held by Google	4.0%	7.3%	10.6%	14.1%	17.3%	18.0%	18.4%	19.0%	19.1%	20.5%	21.5%	22.3%	22.4%
% of Total Google Ad Revenues from US	77.7%	71.0%	66.6%	60.5%	57.5%	54.6%	52.4%	50.8%	49.8%	48.8%	47.9%	46.9%	46.0%
Total International Google Network Ad Revenues	**68.5**	**229.6**	**530.7**	**1,244.6**	**2,131.1**	**3,083.2**	**4,266.3**	**5,786.8**	**7,498.4**	**9,482.0**	**11,717.4**	**14,283.5**	**16,927.1**
Total Worldwide Google Network Ad Revenues	**307.0**	**792.1**	**1,589.0**	**3,150.7**	**5,011.2**	**6,791.0**	**8,965.7**	**11,772.1**	**14,944.9**	**18,530.3**	**22,470.0**	**26,897.3**	**31,322.2**
Total Affiliate Ad Revenues (Assuming loss of AOL)	103.9	628.6	1,554.3	2,647.8	3,405.6	4,188.9	4,817.2	5,419.4	5,907.2	6,320.7	6,699.9	7,034.9	7,316.3
Average TAC %	90.9%	83.8%	79.0%	78.1%	77.5%	76.8%	76.0%	75.2%	75.0%	75.0%	75.0%	75.0%	75.0%
Total Net Affiliate Revenues (Net TAC)	**9.5**	**102.1**	**325.7**	**579.4**	**765.1**	**973.6**	**1,156.6**	**1,342.3**	**1,476.8**	**1,580.2**	**1,675.0**	**1,758.7**	**1,829.1**
Total Other Non-Ad Revenues	28.6	45.3	45.9	63.8	73.4	80.7	87.2	91.5	95.2	98.0	101.0	104.0	107.1
Total Revenues (Net TAC)	**345.1**	**939.5**	**1,960.6**	**3,793.9**	**5,849.7**	**7,845.3**	**10,209.4**	**13,205.9**	**16,516.9**	**20,208.5**	**24,246.0**	**28,760.0**	**33,258.4**
Growth		172.3%	108.7%	93.5%	54.2%	34.1%	30.1%	29.4%	25.1%	22.4%	20.0%	18.6%	15.6%

FCF Forecasts and NPV Calculations

(in millions unless otherwise stated)

	2002A	2003A	2004A	2005A	2006A	2007A	2008A	2009A	2010A	2011A	2012A	2013A	2014A	Terminal
Total Revenues (Net TAC)	**345.1**	**939.5**	**1,960.6**	**3,793.9**	**5,849.7**	**7,845.3**	**10,209.4**	**13,205.9**	**16,516.9**	**20,208.5**	**24,246.0**	**28,760.0**	**33,258.4**	**37,249.4**
Cost of Revenues (non-TAC)	37.1	99.3	229.1	443.1	683.2	916.3	1192.4	1542.4	1929.1	2360.2	2831.8	3359.0	3884.4	
Gross Profit	**308.0**	**840.1**	**1,731.5**	**3,350.8**	**5,166.5**	**6,929.0**	**9,017.0**	**11,663.6**	**14,587.8**	**17,848.3**	**21,414.2**	**25,401.0**	**29,374.0**	
Headcount (in units)	*682*	*1,628*	*3,021*	*5,314*	*8,339*	*11,899*	*15,455*	*18,688*	*21,425*	*23,621*	*25,316*	*26,588*	*27,523*	
Sales and Marketing	43.8	120.3	246.3	428.1	653.5	867.6	1,117.8	1,431.4	1,772.4	2,146.9	2,550.0	2,994.6	3,428.3	
% of Net Revenues	*13%*	*13%*	*13%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*10%*	*10%*	
Research and Development	31.7	91.2	225.6	404.9	645.7	854.1	1,122.6	1,466.6	1,852.7	2,289.4	2,774.3	3,323.7	3,965.5	
% of Net Revenues	*9%*	*10%*	*12%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*12%*	*12%*	
General and Administrative	24.3	56.7	139.7	301.2	451.8	559.3	654.3	754.4	853.2	931.5	991.4	1,038.7	1,073.4	
% of Net Revenues	*7%*	*6%*	*7%*	*8%*	*8%*	*7%*	*6%*	*6%*	*5%*	*5%*	*4%*	*4%*	*3%*	
Stock Compensation	21.6	229.4	278.7	199.8	205.8	212.0	218.3	224.9	231.6	238.6	245.7	253.1	260.7	
% of Net Revenues	*6%*	*24%*	*14%*	*5%*	*4%*	*3%*	*2%*	*2%*	*1%*	*1%*	*1%*	*1%*	*1%*	
Operating Income (Pro-forma of '04 Yahoo! Settlement)	186.5	342.5	841.1	2,016.8	3,209.7	4,436.0	5,904.0	7,786.2	9,877.9	12,241.9	14,852.7	17,790.9	20,646.1	
Depreciation and Amortization	29.0	55.0	118.4	230.3	379.4	506.3	655.6	843.7	1,050.0	1,278.2	1,526.0	1,801.0	1,169.8	
% of Net Revenues	*8%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*4%*	
EBITDA	215.5	397.6	959.5	2,247.1	3,589.1	4,942.3	6,559.6	8,629.9	10,927.9	13,520.2	16,378.7	19,592.0	21,816.0	
Margin	*62%*	*42%*	*49%*	*59%*	*61%*	*63%*	*64%*	*65%*	*66%*	*67%*	*68%*	*68%*	*66%*	
Cash Taxes from Operations	-77.0	-147.0	-110.0	-280.1	-585.0	-1087.3	-1771.1	-2502.7	-3278.4	-4056.1	-4913.6	-5877.6	-6544.8	
Marginal Rate as percentage of EBITDA			*11%*	*12%*	*16%*	*22%*	*27%*	*29%*	*30%*	*30%*	*30%*	*30%*	*30%*	
Capital Expenditures	-37.0	-177.0	-319.0	-655.0	-790.0	-922.6	-1176.6	-1491.5	-1828.2	-2192.0	-2577.4	-2996.1	-3395.4	
As a % of Net Revenues	*11%*	*19%*	*16%*	*12%*	*12%*	*12%*	*12%*	*11%*	*11%*	*11%*	*11%*	*10%*	*10%*	
Donations				-90.0	-35.9	-49.4	-65.6	-86.3	-109.3	-135.2	-163.8	-195.9	-218.2	
As a % of Op Inc.				*4%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	
Changes in NWC	5.0 -	6.0 -	253.0	208.0	49.0	45.0	58.6	75.7	94.7	115.9	139.1	165.0	190.8	
FCF			277.5	1,430.0	2,227.2	2,928.0	3,604.8	4,625.2	5,806.8	7,252.8	8,863.0	10,687.3	11,848.4	12,440.8
YoY Growth				*415%*	*56%*	*31%*	*23%*	*28%*	*26%*	*25%*	*22%*	*21%*	*11%*	
As a % of Net Revenues				*38%*	*38%*	*37%*	*35%*	*35%*	*35%*	*36%*	*37%*	*37%*	*36%*	
NPV				357.5	1,991.9	2,342.0	2,578.8	2,959.1	3,322.7	3,711.6	4,056.4	4,374.7	4,337.5	77,667.0

Sensitivity Analysis

Equity Value Per Share

Intermediate WACC \ Terminal WACC	8.4%	9.4%	10.4%	11.4%	12.4%
9.3%	$622.69	$525.09	$460.44	$414.45	$380.08
10.3%	$579.03	$489.11	$429.54	$387.18	$355.51
11.3%	$539.04	$456.14	$401.22	$362.16	$332.96
12.3%	$502.39	$425.90	$375.23	$339.20	$312.26
13.3%	$468.76	$398.15	$351.36	$318.09	$293.22
14.3%	$437.89	$372.65	$329.42	$298.68	$275.70
15.3%	$409.53	$349.20	$309.24	$280.82	$259.57

Assumed Terminal FCF Margin \ Terminal Growth	5.0%	4.5%	4.0%	3.5%	3.0%
39.4%	$465.21	$436.45	$412.22	$391.51	$373.61
37.4%	$448.09	$420.79	$397.79	$378.13	$361.14
35.4%	$430.97	$405.13	$383.36	$364.75	$348.67
33.4%	$413.85	$389.47	$368.93	$351.37	$336.20
31.4%	$396.73	$373.81	$354.50	$337.99	$323.73
29.4%	$379.61	$358.15	$340.07	$324.61	$311.26
27.4%	$362.49	$342.49	$325.63	$311.24	$298.79

% of Total Terminal FCF from New Business Lines

Year That New Lines of Business First Yield $100m Adtl. FCF	25.0%	20.0%	15.0%	10.0%	5.0%
2006	$488.75	$464.93	$443.76	$424.72	$407.36
2007	$486.78	$463.29	$442.43	$423.72	$406.69
2008	$484.93	$461.76	$441.20	$422.78	$406.07
2009	$483.21	$460.34	$440.06	$421.92	$405.50
2010	$481.60	$459.01	$439.00	$421.13	$404.99
2011	$480.11	$457.78	$438.02	$420.40	$404.51
2012	$478.75	$456.66	$437.13	$419.72	$404.08

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