

SMARTPHONES AND THEIR IMPACT ON NET INCOME PER EMPLOYEE FOR SELECTED U.S. FIRMS

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ABSTRACT

For the last few years, the number of smartphone users has been on a remarkable rise. The number of users increased from 62.6 million in 2010 to 115.8 million in 2012, and expected to increase to 192.4 million by 2016. This increased usage of smartphones by employees poses a dilemma for organizations. Since smartphones can do almost all the tasks (email, internet, and run applications of popular Microsoft software) of a traditional desktop computer, laptop, and phone; smartphone users are expected to be able to do more work outside their normal working hours. Therein lies the possibility that the employees instead of carrying out organizational tasks, may be instead wasting time by of texting, shopping, and using social media. This paper looks at the impact smartphones have on net income per employee at selected U.S. firms. My research shows that use of smartphones has a positive impact on a firm's net income per employee ratio. Alternatively, use of smartphones at these selected U.S. firms does not negatively affect a firm's Net Income per Employee ratio.

KEYWORDS: Productivity, Smartphones, Net Income per Employee

INTRODUCTION

Smartphones have become all pervasive. Global sales of smartphones have skyrocketed from 122 million in 2007 to expected 675 million in 2012 (Statista, 2012). By end of 2017, a third of world population is expected to own and use smartphones (Loveridge, 2013). In terms of revenue, mobile and smartphones had a revenue of \$269 billion in 2012 (Evans, 2013). One study states that “more smartphones are activated each day than babies born,” and “[t]he average smartphone has 41 apps,” (AFP RELAXNEWS, 2013). A survey in early 2012 reported that more than 81% employees use mobile devices at work (Miller-Merrell, 2012). Since smartphones are ubiquitous including at work, it begs the question how employee usage of smartphones affects an organization--especially in terms of productivity.

Many have argued that use of smartphones at work reduces employee productivity and create stress for employees and introduce computer viruses to work computer networks (Tucker, n.d.). However, studies have also shown that smartphones usually have a positive impact on productivity (eWeek, 2012; Mielach, 2013). Although, defining what is productive use of smartphones can mean many things. It can mean anything from saving time in doing a task, work-home commute flexibility, employees' happiness in their ability to read and work on files away from the office and at their preferred time, and quickly access information or communicate with colleagues quickly. At present, most of the studies regarding productivity (or lack of) are based on surveys of employees and or information technology (IT) decision makers. The shortcoming of this approach is that the employees are desirous of smartphones and are unlikely to say anything negative about having smartphones at work. Admission of negative productivity may lead their employer to ban its usage. In addition, the IT decision makers are likely to have a positive outlook because; their continued employment is contingent upon constantly upgrading and working on new hardware and software. Due these shortcomings in previous bodies of work on this topic, there is a need to analyze hard data that shows whether smartphones increase (or decrease) productivity. Additionally, instead of using feel good statistics such as reducing stress, or work home commuting flexibility, there is need to have a variable based on numbers. Therefore, in this study, the concept of Net Income per Employee (NI/E) ratio is used to evaluate productivity. Essentially, this study analyzes

changes in NI/E ratio of selected U.S. companies to determine whether usage of smartphones by their employees increases (or decreases) the NI/E ratio.

This paper in the Introduction section provides background and definition of a smartphone. Followed by an explanation of likely users of smartphones and list of U.S. firms they are most likely to be employed at. Then, under the Discussion and Analysis section, a survey of current literature, along with Data Analysis with use of tables, and t-tests is provided. Finally, the paper has a conclusion section followed by a list of References.

Smartphone

A smartphone is defined as “wireless telephone set with computer enabled features” (Yun, Kettinger, & Lee, 2012, p. 123). Smartphones have revolutionized the way business is conducted. Before their advent, a professional worker needed a separate phone, a laptop computer or a desktop computer with internet connection to accomplish a professional task. This meant that the worker had to be at their desk or near a conference room where different computing and communication devices could be found. Employees were unable to accomplish their work outside of their working hours, and forced to extend their workday. The advent of smartphones has changed all that. A smartphone user can do almost all the office related tasks anywhere where the smartphone device can access voice and data connection. Smartphones have enabled workers to become mobile and accomplish many tasks outside of their normal working hours. Moreover, employers see smartphones as means to increase worker productivity and allowing employees to be able to respond to customer problems and concerns. In turn, employees see smartphones as providing flexibility so that they can be away from the office and still stay connected and get their jobs completed at a more opportune time (Luttenegger, 2010). Ultimately, from an employer’s point of view, use of smartphones should lead to improvement in company’s bottom line (Net Income).

A detriment of the increased smartphone penetration is that a smartphone user is also likely to use smartphones for non-work related activities. Common non-work use of smartphones are surfing the internet, talking, emailing, shopping, texting/messaging, and greater use of social media sites such as Facebook and Twitter. This not only increases the non-productive use of work time, but also increases the time it takes to get back to work and also gives employees the excuse to procrastinate during the working hours (Shellenbarger, 2012). Additionally, installing software from home and unprotected internet connection may cause harm to a firm’s business systems with unsuspecting viruses and worms (Tucker, n.d.). Finally, a lost smartphone can make it difficult to remotely erase company information from the lost device and in case of a disgruntled employee; result in sale of or loss of proprietary information to competitors during employment or after termination (Maltby, 2012). Many firms have struggled with allowing personal use of smartphones for these reasons. Based on these conflicting benefits and harms of smartphones at work, this study looks at impact of smartphones on a firm’s NI/E to determine whether smartphones are beneficial for an organization from the employer’s point of view.

Users of Smartphones and Research Set up

Although a smartphone user can be anyone, it is most likely that younger workers would be the most likely adopters of this device. Thus, this research focuses on the smartphone users who are born in 1977 and later. Heavy users of smartphones are likely to be persons who are 36 years or younger. Persons born from 1977 to 1994 are known as Generation Y, or Echo Boomers or Millennials (Schroer, n.d.). Moreover, Generation Y persons “are known as incredibly sophisticated, technology wise (Shrorer, n.d.)” This generation prefers to communicate through e-mail and text messaging rather than face-to-face contact and prefers webinars and online technology to traditional lecture-based presentations (Kane, n.d.). Persons born from 1995 to 2012 are known as Generation Z, and “will grow up with a highly sophisticated media and computer environment and will be more internet savvy and expert than their Gen

Y forerunner” (Shroer, n.d.). They have a high expectation of instant access to information and records (Simons, 2010). Therefore, Generation Y and Z persons are very likely to be smartphone users. Since it is extremely difficult to get data from firms on the number of employees using smartphones, one can extrapolate that firms that are top employers of new college graduates will have high concentration of Gen Y and Z employees in comparison to firms that are not top employers of recent college graduates. Thus, the next step in the analysis was to look at firms that are top employers of recent college graduates in the United States.

Top US Employers of Recent College Graduates and Median Age

Table 1 below lists 31 top employers for college graduates in 2011 along with the median age of employees at these top firms and the percent change in median age (MA) between 2008 to 2012. Median age is defined as half of the employees under the median age and the other half over it. The median age data shows that an overwhelming number of the listed employers’ median age is around the cut-off age of (about 35) for Generation Y. *This research paper hypothesizes that since Generation Y and Z are the heaviest users of smartphones, they are going to be working at firms that hire recent college graduates and thus changes in NI/E of these companies determine whether use of smartphones affect a firm’s NI/E.* The weakness of this hypothesis is that it also possible that other factors may also lead to changes in a firm’s NI/E.

DISCUSSION AND ANALYSIS

Survey of Current Literature

Interest in finding impact of smartphones (m-devices) on work productively is not new. Many researchers have studied this issue as something that either contributes to the enrichment of work or alternatively as a distraction best avoided. An AFPRELAXNEWS (2013) article reported that an average person checks their smartphones 150 times a day or every 6.5 minutes. Gaming is the most popular activity (43%), followed by social networking (26%); while productivity (2%) and health and fitness (1%) are the least popular ways to use smartphones according to the report. A study on recruitment industry concludes that productivity impact (measured in terms of email activity) of multitasking (activities such as landline phones, pagers, conference calling, video conferencing, email, real time data streaming, real time alerts, mobile telephones, sms/text messaging, browsers, chat rooms, on-line messaging, and social networking) followed a U curve. That is, productivity improved when workers moved from single tasking to multitasking, and as the number of tasks increased, productivity leveled off and as critical number of tasks reached, productivity declined (Bannister & Remenyi, 2009).

Another study involving 515 IT users working in the US found that: (i) 57% of work interruptions involve email, social networks, text messaging or switching windows among disparate standalone tools and applications, (ii) assuming an average salary of \$30/hour, the per day in wasted money translated to about \$10,375 per person per year, and (iii) that addiction to web-based activity is pervasive in the workplace (Harmon.ie., 2011). Another study finds itself advocating the two sides of this issue by summarizing that “while smartphones offer convenience for mobile learning, business transactions, personal use and recreational purposes, etc., they also bring about potential risks and dangers that could cause huge losses in terms of lost company and customer data” (Kahle-Piasecki, Miao, & Ariss, 2012, p. 64). A more nuanced, albeit an older study by IBM & Columbia University notes that IBM employees did not use their smartphones for employee-development mini-courses but rather for in-field performance support from colleagues and for access to late breaking information (Ahmad & Orton, 2010). The Yun et. al (2012) study (based on survey of 3000 smartphone users in South Korea) concludes that smartphones increase work-to-life controversy leading to job stress, yet, smartphones reduce work overload. At the other extreme is a study that analyzes self-reported survey of 80 persons in government and private sector

that finds that “vast majority of Smartphone owners find that their productivity has increased versus those that own standard cell phone” (Kalkbrenner & McCampbell, 2011, p. 1). According to eWeek (2012), nearly $\frac{3}{4}$ of IT decision makers surveyed thought that use of smartphones led to increase in productivity. This study measured productivity by cost savings that resulted from use of tablets and in sales presentations, replacing printed materials, and workgroup collaboration.

A survey of administrative professionals showed that they feel less stressed when they show up for work on Mondays and they use the smartphones : (i) to track to-dos, maps to pull up restaurant and hotel information for out of state employees visiting corporate offices, (ii) to access documents regardless of location, (ii) use of on the go apps such as sticky notes, check-in lists, and voice memos, (iii) tracking superiors and use of flight tracker, travel arrangements and expense-account management, and (iv) synchronizing work and personal calendars (Administrative Professional Today, 2012). In support of smartphones, another report stated that 97 percent of smartphone users use at least one app and “those smartphone users estimate app usage amounts to 88 minutes of time saved a day or 22 days of free time a year.” (Mielach, 2013). This report concluded that text apps saved on average 53 minutes per day, while email apps saved 35 minutes per day; all the saved time resulted in estimated \$12,000 in productivity each year.

Data Analysis

As stated above most of the reports and research papers claim that smartphones have boosted productivity. However, there are two weaknesses to those conclusions. First, those results are limited to certain industries and second, the data is self-reported by the smartphone users. Thus, there is lack of research on impact of smartphone usage on a firm’s finances and for organizations in different industries. This study links the (i) increased use/penetration of smartphones by employees who are young with (ii) entities that these smartphones users are employed by, and (iii) impact on a firm’s financial performance (to Net Income). As indicated previously, Table 1 lists selected U.S. firms that hire new college graduates along with the median ages of its employees in 2008 and 2012.

As the calculation in Table 1 above shows, the percent change in average median age from 2008 to 2012 is 4.37%. Essentially, the median age at employers who are most likely to higher heavy users of smartphones has increased by 4.37%. This increase in median age can be explained by the recession in the United States during 2008-2010 and employees’ reluctance to look for new jobs. When put in this context, the increase in median age is insignificant.

Table 2 below lists names of organizations listed in Table 1 along with their (i) net income (NI) for 2008 and 2012, (ii) number of employees (E) during 2008 and 2012, (iii) NI/E in 2008 and 2012, and (iv) percent change in NI/E between 2008 and 2012.

As the calculation in Table 2 above shows, the percent increase in NI/E from 2008 to 2012 is 82.66%. When the average increase in median age is compared with average change in NI/E, it shows that average median age increased 4.37% (from table 1) while NI/E increased 82.66%.

The number of smartphone users in U.S. in 2008 was 21.4 million (Nielsen, 2009), while in 2012 it was 115.8 million (Statista, 2012). That is a 441% percent increase in number of smartphone user. Therefore, when increase in smartphone users is compared with percent change in NI/E from 2008 to 2012 (441% to 82.66%), it can be concluded that the increased use of smartphones does not negatively affect net income of firms. Rather, there is a positive correlation between the increase in smartphone users and net income per employee.

Table 1: Percent change in Median Age from 2008 to 2012 for employees at Selected U.S. Firms

Rank	Company	MA 08	MA 12	% change MA 08-12
1	Google	27.4	29.3	6.93
2	Apple	31.4	31.6	0.64
3	Walt Disney	32.4	33.7	4.01
8	Nike	32.6	33.7	3.37
10	Goldman Sachs	26.6	28.7	7.89
12	Facebook		29.3	
13	Microsoft	30.8	33.7	9.42
14	Coca-Cola	37.0	33.6	-9.19
15	Proctor & Gamble	35.1	35.5	1.14
16	Bank of America	30.4	32.6	7.24
18	Morgan Stanley	30.9	34.7	12.30
20	Johnson & Johnson	34.0	38.3	12.65
23	Coach	27.1	28.7	5.90
24	Sony	33.4	32.7	-2.10
25	Marriot	31.3	34.3	9.58
27	BMW	29.5	34.4	16.61
28	Macy*s	30.0	34.6	15.33
29	Starbucks	26.1	29.3	12.26
31	Target	27.9	28.3	1.43
33	Hyatt	30.6	31.8	3.92
34	Amazon	30.0	32.0	6.67
35	Wells Fargo	29.3	32.4	10.58
36	Southwest Airlines	39.6	39.3	-0.76
37	Adidas	30.9	29.0	-6.15
38	IBM	36.1	38.5	6.65
40	GE	35.1	37.9	7.98
42	Boeing	36.2	37.8	4.42
43	PepsiCo	33.4	33.5	0.30
44	Citigroup	43.5	34.7	-20.23
47	Time Warner	34.7	35.7	2.88
48	Under Armour	28.7	28.5	-0.70
Average				4.37

This table shows the percent change in Median Age from 2008 to 2012, where MA is Median Age. The median age data was provided by Steven Gottlieb of Payscale.com on January 16, 2013. The list of employers is provided by Lavelle, L., & Stonington, J., (2011). Top 50 Employers for College Graduates. Retrieved, November 9, 2012 from www.images.businessweek.com/slideshows/20110509/50-top-employers-for-college-grads#slide2. The original list has 50 employers, however, because of lack of data 19 organizations (Ernst & Young, PricewaterhouseCoopers, Deloitte, JP Morgan, KPMG, FBI, United Nations, US State Department, CIA, US Treasury, Hilton Hotels, Federal Reserve, L'Oreal, Peace Corps, Grant Thornton, IRS, American Cancer Society, IKEA, and BCG) were omitted from this analysis.

Alternatively, it can also be argued that (i) increase in NI/E could be due to number of other factors (such as better products, or lower number of employees) and (ii) it is unknown whether the number of smartphone users has increased for these individual firms. These are the two weaknesses of this study. Nevertheless, these weaknesses are tempered by the fact that (i) the number of smartphone users has increased more than 400% in four years in the U.S.; and (ii) these users are also proportionately more likely to be employees who are likely adopters of smartphones at the organizations researched in this study.

T-Tests

I compared the MA of each company in 2008 vs 2012 and did the test of significance for the increase in MA. Then, did the same for the NI/E for the same companies for 2008 vs. 2012. Below are the test results and conclusions:

Test of significance of difference in MA for 2008 vs. 2012

N = 31

Calculated t-value = 2.09

Critical t-value at 5% level of significance (tc 0.05) = 1.645

Critical t-value at 10% level of significance (tc 0.1) = 1.282

Table 2: Percent Change in Net Income (NI)/Employee (E) from 2008 to 2012

Rank	Company	NI 08	E 08	NI/E 08	NI 12	E 12	NI/E 12	% change NI/E 08-12
1	Google	4,226,858	20,222	209.02	10,737,000	53,861	199.35	-4.63
2	Apple	4,834,000	32,000	151.06	41,733,000	72,800	573.26	279.48
3	Walt Disney	4,427,000	150,000	29.51	6,173,000	166,000	37.19	26.00
8	Nike	1,883,400	32,500	57.95	2,223,000	44,000	50.52	-12.82
10	Goldman Sachs	2,322	30,067	0.08	7,475	32,400	0.23	198.74
12	Facebook	-	-	-	53	4,619	0.01	
13	Microsoft	17,681,000	91,000	194.30	16,978,000	94,000	180.62	-7.04
14	Coca-Cola	5,807,000	92,400	62.85	9,086,000	150,900	60.21	-4.19
15	Proctor & Gamble	12,075	138,000	0.09	10,904	126,000	0.09	-1.10
16	Bank of America	4,008	243,000	0.02	4,188	267,000	0.02	-4.90
18	Morgan Stanley	-1,285,000	46,964	-27.36	716,000	57,061	12.55	-145.86
20	Johnson & Johnson	12,949	118,700	0.11	10,514	127,600	0.08	-24.47
23	Coach	783,055	12,000	65.25	1,038,910	18,000	57.72	-11.55
24	Sony	369,435	-	-	-398,425	162,700	-2.45	
25	Marriot	362	146,000	0.00	571	127,000	0.00	81.33
27	BMW	330	95,453	0.00	5,122	105,876	0.05	1299.32
28	Macy*s	1,256,000	182,000	6.90	893,000	171,000	5.22	-24.33
29	Starbucks	315,500	176,000	1.79	1,384,700	160,000	8.65	382.78
31	Target	2,214	351,000	0.01	2,999	361,000	0.01	31.70
33	Hyatt	170,000	45,000	3.78	87,000	45,000	1.93	-48.82
34	Amazon	645,000	20,700	31.16	-39,000	88,400	-0.44	-101.42
35	Wells Fargo	2,655,000	158,900	16.71	19,368,000	269,200	71.95	330.60
36	Southwest Airlines	178,000	35,499	5.01	421,000	45,861	9.18	83.08
37	Adidas	644	-	-	524	46,824	0.01	
38	IBM	12,334,000	438,080	28.15	16,604,000	434,246	38.24	35.81
40	GE	17,410	323,000	0.05	13,864	305,000	0.05	-15.67
42	Boeing	2,672	162,200	0.02	3,900	174,400	0.02	35.75
43	PepsiCo	5,142,000	198,000	25.97	6,214,000	278,000	22.35	-13.93
44	Citigroup	-	322,800	-	7,541,000	259,000	29.12	
47	Time Warner	-13,402,000	87,000	154.05	3,016,000	34,000	88.71	-157.58
48	Under Armour	38,220	2,200	17.37	128,778	5,900	21.83	25.64
Average								82.66

This table shows the percent change in NI/E from 2008 to 2012, where NI is Net Income in U.S. dollar, E is number of employees, and NI/E is Net Income divided by total number of Employees for 2008 and 2012. All net income and employee data was retrieved on March 27, 2013 from Mergentonline.com.

Conclusion: In testing for the increase in the MA for the companies for 2008 versus 2012, given that the calculated t-value falls outside of the critical t-value of 1.645 (at 5% level), the increase in the median age in these companies is found to be statistically significant at 5% level.

Test of significance of difference in NI/E for 2008 vs. 2012

N = 31

Calculated t-value = 1.528

Critical t-value at 5% level of significance (tc 0.05) = 1.645

Critical t-value at 10% level of significance (tc 0.1) = 1.282

Conclusion: In testing for the increase in the average NI/E for the same companies for 2008 versus 2012, the increase in the average NI/E in these companies is found to be statistically significant at 10% level only.

CONCLUSION

The goal of this research paper is to tie early adopters of smartphones in the U.S. who are also most likely to work at U.S. organizations that hire recent college graduates with financial performances of these organizations. The results show that between 2008 to 2010, there is minuscule increase average median age and thus early adopters of smartphone users remaining constant or slight increase does not lead to a decrease in the average NI/E, rather the average NI/E increases. This conclusion is limited by the fact that increase in NI/E may be result of better management, better products, and possibly reduction in number of employees. Further research should be conducted to eliminate these possibilities.

More significantly, the penetration of smartphones will continue to increase throughout the world. The number of smartphone shipments will increase from 717.50 million in 2012 to about 1405.3 million units in 2016 worldwide. That is an astounding 96% rate of increase in smartphone shipments in just 4 years. This poses a dilemma for employers: whether these devices help or hurt the firm's income. It is common knowledge that smartphones provide flexibility that allows workers in getting their work done. Unfortunately, the benefits of flexibility may be outweighed by cyberloafing and work distraction. This research paper shows that the changes in NI/E and corresponding increase in smartphone usage in U.S. at worst does not hurt an organization's bottom line, all the while it may be helping it. It is worthwhile to note that the increases in NI/E may be at the expense of extended workday, increasing health problems, and social isolation for the smartphone using employees.

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