

Journal of International Technology and Information Management

Volume 15 | Issue 3

Article 5

2006

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Recommended Citation

Maskara, Pankaj Kumar; Aggarwal, Rajesh; and Maskara, Rajesh (2006) "Access to Computer Technologies at Home Improves Wages in the Marketplace," *Journal of International Technology and Information Management*: Vol. 15: Iss. 3, Article 5.
Available at: <http://scholarworks.lib.csusb.edu/jitim/vol15/iss3/5>

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Access to Computer Technologies at Home Improves Wages in the Marketplace

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ABSTRACT

This study suggests that having access to a computer and the Internet at home leads to better wages. We normally have the idea that people with higher wages have computers and Internet access at home. But with declining prices of home PCs and the increasing importance of Internet, this no longer seems to be the case. The new owners of PC today are considerably poorer and less educated than in the past. People with access to a PC and Internet at home appear to earn 8.6% more than their counterpart. This result seems to suggest that University policies requiring students seeking professional degrees like MBA to own a laptop or Home PC has merit and this policy could be extended to cover undergraduate students also. Universities could also provide dial-in-server access to their recent graduates for a specified period of time to boost their placement statistics.

INTRODUCTION

There is little doubt that the advent of computers and the Internet has increased the productivity of human labor by leaps and bounds but its impact on the wages of skilled and unskilled labor is yet to be clearly understood. There have been studies using the U.S., the U.K., New Zealand and, France (Kruger, 1993; Dolton & Makepeace, 2004; Daldy & Gibson, 2003) data that show significant positive correlation between wages and computer usage at work. However, the causal relationship between the two is yet to be established. Some in literature suggest that the wage differential between the computer users and non-users is largely a result of unobserved heterogeneity, that is, unobserved characteristics that lead to higher wages are more likely to be present in workers that use computer technology on the job (DiNardo & Pischke, 1997).

Hence, we are hypothesizing that one can use an employee's access to Personal Computer (PC) and the Internet at home (rather than his computer usage at work) as an independent variable to explain his/her higher wages in the marketplace. Research shows that it is not the computer usage but computer skills of the user that impacts wages. People with computers at home tend to have better computer skills than their counterparts. That is probably why, companies like DuPont and McDonnell-Douglas have used financial incentives to help their employees purchase their own computers with the justification that such actions helps them keep the training costs down and improves their employee's business decision making.

Also, the job search process today involves a lot more than what it used to in the past. Today, the process includes finding information about the latest format of writing resumes and cover letters, gathering information on available jobs and on prospective employers, writing letters and emails to placement agencies and human resource department of prospective employers, updating and posting resumes and cover letters on job placement sites, doing research on the employer before interviews, writing thank you notes, and following up after interviews via email. Needless to say, this is a highly information-intensive process and one's access to a PC is a critical factor in determining one's success in a job search process. Hence, we believe that people with access to PC at home are more likely to find the right job at higher wages because they (a) have resources to do better job search at a lower cost, (b) are more up to date in their knowledge of current affairs, (c) maintain their social networks through frequent communication (via email, messengers and chat rooms) and are therefore more likely to find the right job at

higher wages, (d) have better information regarding the market value of their skills and therefore, have higher negotiating power during performance reviews, and (e) are more productive at work (Robinson, Levin & Hak, 1998). In this paper we have, therefore, used access to PC at home and access to the Internet as our key variables to explain wages.

We are hopeful that our approach to finding the answer to the wage differential of home computer owners and non-owners will also help us answer some critical policy related questions. Is it advisable for Universities to make it mandatory for the students to own a PC at home? Should Universities provide free Dial-in Server access from home to their recent graduates for a specified period of time, thereby, providing them with the all-important Internet connectivity?

The remainder of this paper is organized as follows. The next section reviews the literature pertaining to impact of computer usage on wages and the social characteristics of individuals who use computer at home. Section 3 describes the data we use for our empirical study. We present some descriptive statistics for our data in section 4 and measure the wage differential for home PC ownership in section 5. The final section discusses the interpretation of the results.

BACKGROUND

Computer usage at work is defined by DiNardo and Pischke (1997) as use of computers on shop floors, office computers, PCs, terminals, word processors, and CAD systems. Krueger (1993) argued in his landmark paper that workers in the U.S. who use computer on their job earn 10 to 15 percent higher wages. Dolton and Makepeace (2004) concluded that there was a substantial premium associated with computer use for some individuals in UK and Dalry & Gibson (2003) found that there is a significant effect on wages for workers in New Zealand who received some computer training. Similar wage differential associated with computer use was found for Germany (DiNardo & Pischke, 1997) and for France (Entorf & Kramarz, 1997). These studies were attempts to resolve the question, whether the computer usage cause the wage differential or the observed wage differentials between computer users and nonusers are largely a reflection of unobserved heterogeneity.

DiNardo and Pischke (1997) found that measured wage differentials with “white collar” tools like pencils, calculators and, telephone are almost as large as those measured for computer use but we probably do not have a reason to believe that use of such tools in fact caused the higher wages. Hence, one cannot help but be skeptical of the causal effect of computer usage on wages. Entorf, Gollac and Kramarz (1999) found that the wage differentials for new technologies (NT) users drop from 15-20% to less than 2% when taking into consideration the fact that NT workers were better paid than nonusers even before the introduction of NT. Autor, Katz and Krueger (1998) conclude that educational upgrading occurred more rapidly in industries with greater computer utilization in the 1980s and early 1990s and the expansion in computer use in the 1980s can account for almost half the increase in the return of education (Krueger, 1993). Also, Entorf and Kramarz (1997) show that computer based new technologies are used by much more able workers and each year of experience with computer based NT adds around just 1% to the wage of the worker. Hence, it is pretty evident that computer usage at work in itself does not have a significant influence on higher wages. We, therefore, take an alternative approach of measuring the wage differential of the workers based on their access to a PC at home and not based on their use of PC at work.

Wigham (2004) found that due to the low cost of internet, speed of response, and the time saving nature of Internet-based recruiting, majority of the corporations now use the web as an integral part of their recruitment strategy and job candidates use Internet for their job search. It is reasonable to assume that people with access to PC at home can do a better job search than those with access to PC at work and/or no access to a PC. Better match between the candidate and the job ensures that both the worker and the corporation gain, thereby, resulting in higher productivity and wages. Further, after examining national and regional salary trends of IT managers, Koong, Lui and Fowler (2003) determined that irrespective of the economic conditions salaries of IT managers will continue to rise. Nath and Murthy (2003) analyzed data from sixty-two countries and found significant relationship between a nation's economic condition and its diffusion rate of Internet.

Additionally, it is a well-documented fact that success is very often a result of effective social networking and better communication skills. People with PC at home spend significant amount of their time chatting with their

friends and family, emailing their personal contacts and surfing news and/or other websites of personal interest. Such people tend to be up to date on their knowledge of current affairs, fashion, movies and other topics of social interest. Robinson, Levin and Hak (1998) found in a survey of 12,376 respondents that people who spend their free time on computer at home also spend more time on leisure activities like attending art events, stage play, reading, listening to radio and, attending movies. Haas (1998) found that people with home PC research products online before buying, thereby reducing their time spent shopping and increasing their free time for other leisure activities.. This leads us to believe that people who use PC at home enjoy their lives after work and are therefore, relatively more productive while at work.

Further, people who have access to a PC at home tend to have relevant computer skills like emailing, browsing, word processing etc. Wadsworth and Schmitt (2004) look at ten years' data on GCSE and A level results to study the relationship between household computer ownership and students' educational attainment. They find a positive, statistically significant relationship between the ownership of PC and the students' GCSE grades. Similarly, Herskovic et al., (2000) find positive correlation between computer ownership and computer skills in a study of Chilean medical students.

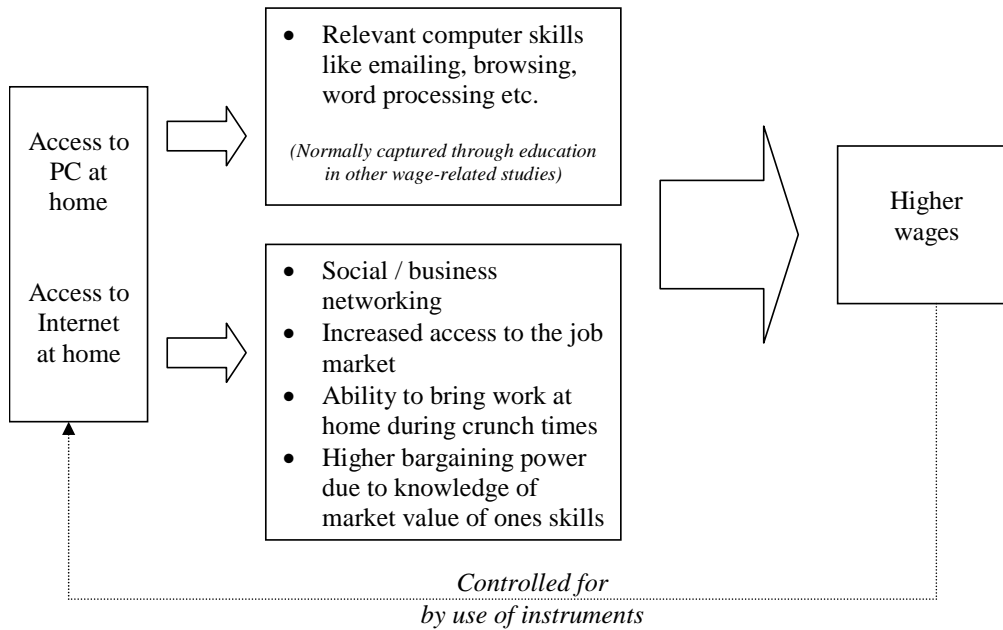
Also, people with access to a PC at home can continuously search for better opportunities in the job market and thus be more aware of their market value. The knowledge of their market values gives them more negotiation power during annual performance reviews. Also, they have the resources to bring work home during crunch times thereby making themselves more valuable to their employers. All the above arguments lead us to hypothesize that people with access to PC at home not only have higher probabilities of getting into the right job at higher wages but also have higher productivity, are more valuable to their employers, have higher negotiation power and are therefore more likely to retain their jobs with relatively higher wages.

DATA

We use the data from the National Longitudinal Survey of Youth (NLSY). The NLSY is an ongoing study of a nationally representative sample of 12,686 men and women who were born between January 1, 1957 and December 31, 1964 (ages 14-21 as of December 31, 1978.) These individuals were interviewed annually from 1979 through 1994 and are currently interviewed on a biennial basis by the Bureau of Labor Statistics, US Department of Labor. It includes a cross-sectional sample of 6,111 respondents designed to be representative of the non-institutional civilian segment. It includes a supplemental sample of 5,295 respondents who are black, Hispanic or economically disadvantaged. It also includes 1280 respondents who were enlisted in the military. The NLSY'79 data supplies a wealth of information on the wages, behavioral characteristics, demographics, and family background of each respondent.

We have used the year 2000 and the year 2002 data from the NLSY in our paper. The questions in the surveys of year 2000 and 2002 were similar and exactly comparable with regards to ownership of PC, access to Internet, region of residence, gender and education. However, the race of the respondent was categorized as white, black and others in the year 2000, whereas, the respondents were categorized as white, black, Hispanic, American Indian, Hawaiian or Pacific Islander, Asian and others in the year 2002. Though the original study of NLSY'79 started with 12,686 respondents, the number of observations available from the 2000 survey is just 8033. This is because the NLSY over sampled poor whites till 1991 and veterans till 1984 only. Additionally, several respondents have dropped out of the survey over a period of time. The respondents who dropped out either died or moved to a different location and were not traceable. No systematic bias in any of the variables used in this study is expected as a result of this drop out.

Figure 1. Relationship model.



In the year 2000, the respondents of the survey were of the age ranging from 35 to 43 and a significant percentage of these respondents owned a PC at home. As almost all the respondents were middle-aged, work experience is not expected to play a differentiating role in determining their wages. Hence we use the variables for gender, race, education, region of residence, access to PC at home, and access to Internet at home to explain the wages of the respondents. For the purpose of our paper, the two most important questions that were asked of the respondents in the year 2000 and 2002 were as follows – 1. Do you have a personal computer at home running Microsoft Windows 95/98 or Windows NT? 2. Does your computer have the ability to access the Internet (World Wide Web, FTP servers, News Services, etc.) through a modem or other connection?

DESCRIPTIVE STATISTICS

Means of important variables are shown in Table 1, by ownership of PC at home. As the data in Table 1 shows 59% of the respondents in the year 2000 and 68% of the respondents in the year 2002 reported access to a home PC. As one would expect the more educated people are more likely to own a home PC. People who owned PC at home had on average almost 14 years of education as compared to 12 years of education for those who did not. It is surprising to know that females are more likely to have a PC at home than males. Even though there were 49% males in the overall data only 47% of the PC owner were males. It is also evident that whites are highly likely to own a PC as compared to blacks, Hispanics and American Indians. Also, people in the northeast and the west are more likely to own a PC at home as compared to the people in the south.

Table 1. Mean characteristics in 2000 and 2002 cross-section data by ownership of PC at home.

Characteristics	2000		2002	
	PC	No PC	PC	No PC
Personal Characteristics				
Years of Education	13.86	12.13**	13.80	11.92**
Age	38.6	38.5	40.6	40.6
% Male	46.9%	51.6%**	46.9%	52.9%**
% Black	21.4%	42.3%**	22.2%	47.1%**

% White	73.0%	50.4%**	67.7%	39.8%**
% Hispanic			5.6%	8.0%**
% American Indian/others			2.0%	2.0%
% Urban	73.8%	77.5%**	78.6%	80.8%*
% not living in MSA	5.1%	8.0%**		
% living in MSA but not city	68.9%	52.9%**	17.1%	21.7%**
% Residing in city limits	23.6%	36.4%**	23.7%	35.4%**
Employer Characteristics				
% Covered by Union Agreements	5.2%	3.9%**	4.7%	4.2%
% with Union like agreements	18.3%	14.8%**	17.8%	15.3%**
% located in the North east	16.3%	14.3%**	16.2%	13.7%**
% located in the south	37.6%	45.8%**	38.0%	48.2%**
% located in the west	20.5%	18.3%**	19.9%	17.4%**
% who know how to use Browsers	80.1%		89.0%	
% with access to Internet at Home PC	79.6%		88.6%	
% who took computer related training			6.9%	3.2%**
Hourly Wages	18.21	11.98 **	18.71	11.71**
Sample-Size	4,697	3,301	5,229	2,493

* Mean value for Owners of PC is significantly different from the mean value of the non-owners at the 10% level;
 ** at the 5% level.

However, it is interesting to see that people living in the central cities and in the urban areas are less likely to own a PC at home as compared to those who live in the suburbs. Even though more than 75% of the respondents lived in the urban areas only 73.5% of the home PC owners were urban residents. Similarly, 25.5% of the respondents lived in the central cities of the MSA but only 23.5% of the home PC owners were central city residents. Additionally, 80% of the respondents who owned a home PC knew how to use internet browsers like Internet Explore and Netscape to access the web and almost all of them reported access to the web from their home PC through a modem connection. People who are aware of the capabilities of the Internet already seem to have Internet access at home.

Table 2. Characteristics of those respondents who upgraded their PC ownership and Internet access status between 2000 and 2002.

<i>Characteristic</i>	Overall Data	No-PC to PC	PC No-Internet to PC with Internet	No-PC to PC with Internet
Years of Education in 2000	13.15	12.80**	13.36*	13.17
% Male	48.8%	47.0%	40.1%**	46.5%
Age in 2000	38.59	38.45*	38.57	38.38**
Hourly Wage in 2000	15.72	14.40**	15.74	15.36
Hourly wage in 2002	16.66	14.82**	16.69	15.87*
<i>By Residence</i>				
% residing in North east in '02	14.1%	15.2%	14.2%	16.9%**
% residing in the south in '02	38.2%	41.5%*	42.1%	40.9%
% residing in the west in '02	17.5%	19.4%	17.5%	17.6%
% urban	75.3%	77.1%	65.4%**	77.6%
% residing out of central city '02	17.2%	20.5%**	20.0%	20.4%**
% residing in the city '02	25.4%	32.2%**	20.9%**	31.7%**
<i>By Race</i>				

% white	59.0%	55.3%**	65.3%**	59.1%
% black	30.0%	32.1%	24.1%**	30.2%
% American Indian	1.4%	2.4%**	1.2%	2.2%*
% Hispanic	6.3%	7.9%*	6.7%	7.4%
% Other race	4.4%	4.0%	3.9%	2.7%**
sample size	7998	948	416	675

* Mean value is significantly different from the mean of the overall data at the 10% level; ** at the 5% level.

We outline the direction in which PC ownership and the Internet connectivity of home PC is moving in Table 2. The *No-PC to PC* (NP-P) column of the table represents those respondents who did not have a PC in 2000 but had a home PC in 2002. The *PC but no-Internet to PC with Internet* (P-P&I) column represents respondents who reported having a PC without Internet connection in 2000 and had a PC with Internet connection in 2002. The *No-PC to PC and Internet* (NP-P&I) column is for those respondents who did not have a PC in 2000 but had a PC with Internet connection in the year 2002. As noted earlier home PC ownership increased from 59% in 2000 to 68% in 2002. This shows that 29.7% of the respondents who did not have access to home PC in the year 2000 reported access to home PC in 2002. Similarly, 45% of the respondents who had a PC in the year 2000 but did not have access to the Internet had access to the Internet in the year 2002. 21.1% of the respondents who did not have a PC ended up having a PC with Internet connection in the year 2002. (Note: the percentages have been calculated after accounting for the decrease in the number of respondents from 7,998 in 2000 to 7,722 in the year 2002.)

Table 2 suggests that new home PC owners are significantly less educated than the overall average. This indicates that now the less educated people are buying home PCs whereas, the highly educated people who already had PCs are probably upgrading their PCs and/or are connecting their PC to the Internet if they did not already have Internet access. The data also shows that only 40.1% of the respondents of the P-P&I category were males as compared to the overall average of 48.8%. This means that males are less likely to buy Internet connection for their existing home PC as compared to females. We also note that new home PC owners have lower wages than the overall average. The data also suggests that more people in the northeast bought a new home PC with Internet connection as compared to people in the west and the north central. People living in the cities and the urban areas were reluctant to buy access to internet connection for their existing home PCs but were more willing to buy a new PC with Internet connection.

Finally, we note that blacks in the P-P&I category were significantly lower than their overall average and the white were significantly higher in the same category. This suggests that black home PC owners are less likely to buy access to Internet on their home PC as compared to the whites.

ESTIMATION

To assess the wage differential associated with access to PC at home we run a number of standard wage regressions. Our dependent variable is the log of gross average hourly earnings. Our approach is to simply include a dummy variable for ownership of PC and a dummy variable for access to the Internet at home in a standard regression augmented by a full range of personal characteristics and employer characteristics. The regression takes the form

$$\ln W_i = \alpha + \beta_1 P_i + \beta_2 E_i + \beta_3 C_i + \varepsilon_i \quad (1)$$

Where W_i represents wages, P_i is a vector of observed individual characteristics like education, race and gender, E_i is a vector of employer characteristics, and C_i is a vector of variable for ownership of PC and access to the web at home.

Results from the OLS regression in equation (1) are presented in Table 3. We have separated out the effects of education and other observable characteristics of the employer and the employee on the wages of the respondent. Columns (1) and (4) show the impact of education on the wages. There appears to be a wage differential of 9.5% for every year of education. However, as shown in columns (2) and (5), when we include ownership of home PC in the regression model the impact of education is reduced by almost 1.5% per year of education and home PC ownership

becomes the most important explanatory variable in the model. The model suggests that there is a wage differential of 23-26% between home PC owners and non-owners. We realize that the wage differential for home PC ownership is inflated due to endogeneity, i.e. people with higher wages have higher likelihood of owning home PC. Therefore, we will address this issue later in the paper using the 2SLS approach.

To understand the mechanism thru which home PC ownership impact wages we add the variable for access to Internet connection in the regression model in columns (3) and (6). We find that almost 50% of the wage differential between PC owners and non-owners is due to PC owners' access to Internet at home. In the year 2002 access to Internet accounts for almost 60% of the wage differential.

Table 3. OLS Regression for the Effect of Home PC Ownership and Access to Internet at Home. (Dependent Variable: Log Hourly Wage)

Independent Variable	2000			2002			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of education	0.0951 *	0.0816 *	0.0793 *	0.0956 *	0.0815 *	0.0785 *	0.0763 *
Owned PC at home 2000	0.0024	0.2304 *	0.1331 *	0.0026	0.0027	0.0027	0.0028
Internet access at home 2000		0.0125	0.0187				0.0214
Owned PC at home 2002			0.1285 *				0.0871 *
Internet access at home 2002			0.0185		0.2585 *	0.1269 *	0.0219
Intercept							
# of Obs.	1.0996 *	1.1335 *	1.1699 *	1.1694 *	1.1893 *	1.2377 *	1.2072 *
R-Squared	6,405	6,379	6,366	5,973	5,972	5,966	5,701
	0.3012	0.3372	0.3429	0.2915	0.3281	0.3331	0.3413

*Coefficient significant at 5% level

All models control for location of residence (SMSA/city, Urban/rural), gender, race, region of residence and, union membership. (Standard error in **bold**)

With the growth in the Internet connectivity over the last decade the importance of Internet has grown exponentially due to the networking effect. This networking effect can be well understood by taking the example of telephones. When the telephones first came into existence they were not as helpful because more often than not the people you wanted to communicate with did not have a telephone connection. However, as the number of telephone connections increased its importance also increased, which in turn increased telephone connectivity. Similarly, as more people gain access to the Internet it has become essential for companies and individuals to post information on the web because the intended recipients of the information are increasingly looking for the information on Internet.

Underscoring our point we find in Table 3 that the wage differential for people who had access to Internet in 2000 was 12.8% but it increased to 15.8% in 2002. Column (7) of the table uses both the variables of PC ownership and Internet access in the two years to explain the wages differential in the year 2002. We note that wage differential for Internet access was lower than PC ownership in 2000 but it was significantly higher in the year 2002. This further confirms our belief of the networking effect. Also, one could argue that the wage differentials for PC ownership and Internet access in 2000 in column (7), to some extent, proxy for the impact of home PC on getting the right job at higher wage. Whereas, wage differential for PC ownership and Internet access in year 2002 proxy for the impact of home PC on retaining the higher paying job and on better performance reviews.

Following the tradition of the relevant literature we control for education, location, gender, race and, union agreements in our regression model. In the interest of space we have not reported the coefficients for the control

variable. However, as expected we find that all these variables are highly significant. We find that whites earn 4-5% higher than the others. Whereas, the blacks and the American Indians earn 8-10% lower than the others. People working for employers that have union like associations earn 17-18% higher than those working for employers that do not have such associations. Employers in the northeast tend to pay 9% higher wages to their employees than those in the north central. It is interesting to note that except for the variable accounting for union representation none of the variables that are traditionally controlled for have a wage differential of over 10% whereas, PC ownership has a wage differential of over 25% yet none of the studies that we are aware of till date have ever controlled for PC ownership.

Table 4. OLS Regression for the Effect of PC Ownership & Internet Access at Home for High Income Group. (Dependent variable: PC at home)

Independent Variable	2000			2002			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Years of education	0.0475 *	0.0454 *	0.0443 *	0.0517 *	0.0488 *	0.0477 *	0.0471 *
Owned PC at home 2000	0.0024	0.0025	0.0025	0.0024	0.0025	0.0025	0.0025
Owned PC at home 2002		0.0708 *	0.0161		0.0979 *	0.0027	-0.0028
Internet access at home 2000		0.0146	0.0216		0.0167	0.0281	0.0303
Internet access at home 2002			0.0659 *			0.1081 *	0.0719 *
			0.0193			0.0250	0.0282
Intercept	2.3327 *	2.3017 *	2.3159 *	2.2494 *	2.2081 *	2.2299 *	2.2537 *
# of Obs.	2,800	2,788	2,781	2,899	2,898	2,898	2,789
R-Squared	0.1511	0.1582	0.1622	0.1751	0.1844	0.1894	0.1923

*Coefficient significant at 5% level

All models control for location of residence (SMSA/city, Urban/rural), gender, race, region of residence and, union membership. (Standard error in **bold**)

One of the possible reasons behind non-inclusion of PC ownership as an independent variable in the traditional literature is the perception that people with higher wages tend to own a PC and not the other way round. This was certainly true in the 90's but with the sharp decline in the prices of PCs over the last ten years PC is no longer a privilege only for the higher income people. Table 2 shows that the average wage of the people who bought computers between 2000 and 2002 was significantly lower than the overall average.

To further clarify our point we run regression on those observations that have hourly wage higher than 14.40 only. This group of respondents understandably has no financial constraints as far as buying a home PC is concerned. Hence, their hourly wage is not expected to impact their home PC ownership. Table 4 shows the results of the regression of the log value of gross hourly wages of the respondents of this group on the home PC ownership & internet access at home after controlling for the traditional variables mentioned earlier. We find that the wage differential for PC owners and non-owners in this group is 8% in 2000 (Column 2, Table 4) and 10% in 2002 (Column 5, Table 4). Though this wage differential is significantly lower than that for the whole sample, it is still significant. We note that though other explanatory variables like location of residence and unions at workplace become insignificant (not reported in Table 4) in the regression for this group, PC ownership remains a highly significant variable, thereby, supporting our hypothesis. When we include the access to Internet variable in the regression (Column 3 and Column 6, Table 4), PC ownership becomes insignificant thereby showing that access to

Internet captures almost all of the effect of PC ownership. This further strengthens our argument that access to Internet results in respondents being able to get and maintain better jobs with higher wages.

**TABLE 5. First stage of the 2SLS regression.
(Dependent variable: PC at home)**

Independent Variable	2000		
	Coefficient	Standard Error	P-Value
How often teacher has child use a computer?	0.0062	0.0014	<.0001
Would respondent like to be on the same job when 35 years old?	0.2516	0.0779	0.0012
Do You Expect To Be In School 5 Years From Now?	0.0041	0.0144	0.7743
Number of Children of Mother In Household	-0.0200	0.0151	0.1861
Family Members In Household	0.0069	0.0029	0.0198
Age of Youngest Family Member	0.0054	0.0008	<.0001
Years of Education	0.0563	0.0032	<.0001
Intercept	-0.2115	0.1364	0.1210
No. of Obs.			4856
R-Squared			0.1919

Variables for location of residence (SMSA/city, Urban/rural), gender, race, region of residence and, union membership also included.

Finally, we run a two stage least square (2SLS) regression to put at rest all the concerns regarding endogeneity in our model. We first estimate a model (refer to Table 5) to predict the probability of a respondent having access to a home PC. To do so, we get the data for the offspring of the respondents of the NLSY'79 from the 'NLSY79 Children and Young Adults' dataset, a separate survey of all children born to NLSY79 female respondents. In addition to the entire mother's information from the NLSY79, this child survey includes information on the child's schooling, training, work experiences and expectations, health, dating, fertility and marital histories, and household composition. We merge this dataset with our original dataset and use the following additional variables from the child dataset to predict the probability of a respondent having PC at home in the year 2000. The variables used account for the child's use of computer for school work, his satisfaction at current job, his desire for education in future, number of siblings, age of youngest sibling, and education. We estimate a LP model based on these variables and the other variables from the original dataset to calculate the probability of a respondent having access to a home PC. For predicted probabilities greater than 0.5 we assign a value of 1 for the predicted home PC ownership variable, zero otherwise. The goodness of fit for our predicted values is a bit over 70%.

**TABLE 6. Second stage of the 2SLS regression.
(Dependent variable: Log Hourly Wage)**

Independent Variable	2000		
	Coefficient	Standard Error	P-Value
Predicted value of home PC ownership	0.0865	0.0248	0.0005
Intercept	5.7598	0.1724	<.0001
No. of Obs.			4755
R-Squared			0.2311

Control variables used for location of residence (SMSA/city, Urban/rural), gender, race, region of residence and, union membership

In the second stage of the 2SLS we run a regression of log hourly wage variable on the predicted home PC ownership variable and all the other control variables used in the earlier regressions. The results of this regression are shown in Table 6. We find that the coefficient estimate of the home PC variable is positive and significant. The results suggest that respondents with access to a PC at home earn 8.65 % more than their counterparts. This finding lends credibility to our argument that home ownership has significant impact on the respondent's wage earnings.

CONCLUSIONS

Our results suggest that people who own a PC at home and have Internet access at home tend to earn almost 9% higher wages than those who do not own a home PC. Additionally, the wage premium associated with home PC and access to the Internet seems to be on the rise. As the Internet becomes ubiquitous the wage premium associated with PC ownership and Internet access will level down but that is not expected to happen in the near future. In the nineties, PC ownership was a luxury and therefore wage differential associated with owning a PC were overshadowed by the impact of wages on the *capability* of an individual to own a PC. Also the benefits associated with access to the Internet were limited in those days. Fortunately, with the unprecedented growth in the number of web pages available on the Internet and the relative ease of use of the Internet, it has become the medium of choice for communication. This has brought about the wage differential for PC ownership and this premium should last for quite some time to come.

Even though we have tried to present an alternative way to explain the impact of computers on wages in this paper, we know that computers impact our lives in more than one ways. Literature in the past focused on the use of computer at work and on computer skills. We hope this paper provides some direction to the literature in finding alternative ways to explain the economic impact of computers. Future research in this direction could possibly concentrate more on separating the impact of wages on PC ownership from the positive wage impact of PC ownership. Though we have used relevant econometric tools at our disposal to control for endogeneity, the problem of wage differential is too complex to be addressed by a single variable or a single study. There are several unobserved socio-economic factors that create wage differentials in our society and therefore, conclusions drawn from data with such unobserved heterogeneity needs to be interpreted with appropriate caution. Also, this paper uses the data from the high-income segment to minimize the reverse causality effect but such an analysis could be a victim of selection bias. However, even when we use data for all respondents (in our 2SLS estimation), our estimates of wage differential due to home PC ownership is 8.65% which is similar to 8-10% wage differential that we find for high income segment. Hence, we are led to believe that the results of our study are not driven by selection bias.

Our results seem to suggest that University policies requiring students seeking professional degrees like MBA to own a laptop or Home PC has merit and this policy could be extended to cover undergraduate students also. Universities could also provide dial-in-server access to their recent graduates for a specified period of time to boost their placement statistics.

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