مجلة جامعة صبراتة العلمية
Sabratha University Scientific Journal

مجلة علمية نصف سنوية محكمة متخصصة في العلوم الإنسانية

تصدرها جامعة صبراتة بشكل الكتروني

The Relationship between the Educational Attainment and Median Wages in theU.S. Labour Market during the period from 2000 to 2023

العلاقة بين التحصيل التعليمي ومتوسط الأجور في سوق العمل الأمريكي خلال الفترة 2000–2023

Dr. Salem Gheit
د.سالم غيث ماضي
دكتوراه الاقتصاد
أستاذ مساعد بجامعة بنـــــي وليد
Assistant Professor of Economics, The Economics Department,
The Business School, Bani Waleed University
salemgheit@gmail.com

رقم الإيداع القانوني بدار الكتب الوطنية:
2017-139

الترقيم الدولي:
ISSN (print) 2522 - 6460
ISSN (Online) 2707 - 6555

الموقع الألكتروني للمجلة:
https://jhs.sabu.edu.ly

The Relationship between the Educational Attainment and Median Wages in theU.S. Labour Market during the period from 2000 to 2023

العلاقة بين التحصيل التعليمي ومتوسط الأجور في سوق العمل الأمريكي خلال الفترة 2000–2023

Dr. Salem Gheit *

Abstract

This paper aims to explore the relationship between the level of education and median wages in the United States spanning the period between the 1st quarter of 2000 and the 1st quarter of 2023. The study adopted a descriptive analytical approach in order to examine the impact of educational attainment on the median usual weekly earnings of full-time wage and salary workers over the 23-year period using the data collected form the Bureau of Labor Statistic BLS as one of the main and reliable data sources in the United States. It is found that the median usual weekly earnings for those aged 25 years and older with bachelor's degree and higher has been improving significantly – quarterly averaged – during the stated period. This is where they increased by about 82% from 886 US$ in the 1st quarter of the year 2000 to 1621 US$ in the 1st quarter of the year current year 2023. Whereas the median wages paid to those with some college or associate degrees grew by over 68% from 590 US$ in the 1st quarter of the year 2000 to 995 US$ in the 1st quarter of the year 2023. On the other hand, the average weekly earnings of those with degrees less a high school diploma rose by a much higher rate with approximately 87% over the same period.

Keywords: *Educational Attainment, Median Wages,Average Years of Schooling.*

العلاقة بين التحصيل التعليمي ومتوسط الأجور في سوق العمل الأمريكي خلال الفترة 2000 – 2023

ملخص:

تهدف هذه الورقة إلى البحث في العلاقة بين التحصيل التعليمي ومتوسط الأجور في الولايات المتحدة خلال الفترة الممتدة من الربع الأول من عام 2000 إلى الربع الأول من عام 2023. تبنت الدراسة منهجاً تحليلياً وصفياً من أجل فحص تأثير التحصيل العلمي على متوسط الدخل الأسبوعي للعاملين بأجر وبدوام كامل خلال فترة 23 عاماً باستخدام البيانات التي تم جمعها من مكتب إحصاءات العمل BLS باعتباره أحد أهم مصادر البيانات الرئيسية والموثوقة في الولايات المتحدة. وجدت الدراسة أن متوسط الدخل الأسبوعي لأولئك الذين تبلغ أعمارهم 25 عاماً فما فوق والحاصلين على درجة البكالوريوس وما فوق قد تحسن بشكل ملحوظ – بحساب المتوسط الفصلي – خلال الفترة المذكورة. إذ لوحظ أن متوسط الأجور قد ارتفعت بنحو 82٪ من 886 دولاراً أمريكياً في الربع الأول من عام 2000 إلى 1621 دولاراً أمريكياً في الربع الأول من العام الحالي 2023. في حين أن متوسط الأجور المدفوعة لأولئك الذين حضروا سنوات معينة في الجامعة لكنهم لم يتموا المرحلة الجامعية نمت بأكثر من 68٪ من 590 دولاراً أمريكياً في الربع الأول من عام 2000 إلى 995 دولار أمريكي في الربع الأول من عام 2023. من ناحية أخرى ، ارتفع متوسط الدخل الأسبوعي لأولئك الحاصلين على درجات أقل من شهادة الدراسة الثانوية بمعدل أعلى بكثير بما يقارب من 87٪ خلال نفس الفترة.

الكلمات المفتاحية: التحصيل التعليمي ، متوسط الأجور ، متوسط سنوات الدراسة.

1. Introduction

In 1958, and in his pioneering work, Jacob Mincer had come up with a new concept concerning the relationship between the years of schooling and earnings which has been known as "human-capital earnings function". It hadconsidered earnings as a function of the accumulation in human capital stock and skills that are acquired via education and training in

* Assistant Professor of Economics, The Economics Department,
The Business School, Bani Waleed University
salemgheit@gmail.com

which individuals had been involved in the previous years.The Mincer's concept indicated that this accumulation in human capital is the outcome of a series of positive net investments in order to increase earnings over a worker's lifetime, (Mincer & Polachek, 1974). Mincer also strived to investigate the way of how earnings are distributed across the population, where some important questions had been raised in this respect such as; Why do males earn more than females? Why do occupational distributions differ by gender? Why earnings growth is smaller for those who do not permanently participate in the labour force? (Polachek, 2008).

In 1974, Mincer published the "Schooling, Experience, and Earnings" in the labour economics field. He modelled the natural logarithm of earnings as a function of years of education and years of potential labour market experience (age – years of schooling – 6). Mincer had pointed out that the schooling part of the equation was an equilibrium condition in the model were the main objective of investing in people is to maximize the present value of the future earnings, (Lemieux, 2006).

According to the theory of human capital, the wage differentials can be explained through the variations in the marginal productivity for workers. However, having said that, some studies have come to light and suggested that this principle is not always true for all cases. In the United States for instance, Hellerstein, Neumark and Troske (1999) in their study "Wages, Productivity, and Worker Characteristics" underscored that women lower wages do not reflect in reality their lower relative marginal productivity, (Crepon, Deniau, & Perez-Duarte, 2003). Moreover, it is also observed that in the case when the training cost is shared between an employee and their employer, the real return of training is likely to be underestimated caused by the wage premium for training, (Dearden, Reed, & Van Reenen, 2000).

Since the mid-1970s, earnings inequality and the wages' structure began to rise in several developed economies. This has drawn many economists' attention,as they examine the rationales over what has driven this variation to happen. The prevailing mainstream opinion, in explaining this divergence, was to attribute it to what is known as a 'Skill-Biased Technological Change' SBTC, which in effect, and by definition, means that technical progress has favoured skilled workers, which in turn has led to it generating higher productivity and wages, (Kaplanis, 2010).

In consonance with the neoclassical theory of production and distribution, (Ferguson, 2008), real wages are dependent on, and determined by, the marginal productivity of labour, which measures an additional worker's contribution to the firm's output, assuming capital to be constant. However, on the other side, and in consistency with the characterization of the Cobb-Douglas of the production function, the marginal productivity of labour is assumed to be proportional to the average labour productivity,(Sheffield, 2013). Irrespective of the claims that regard this characterization as a misleading one, empirical research has highlighted the strong positive link of the growth rate of labour productivity with the growth rate of real wages and vice versa, (Mankiw, 2010).

2. Literature Review

A great deal of research and studies had highlighted and investigated the impact of human capital on wages and earning. There are a wide variety of methods and approaches in the related literature that had been utilised so as to estimate human capital and its various impacts, (Tchernis, 2010). In labour economics and the economics of education, it is vastly agreed upon that the earnings functions are the most commonly applied empirical equations. Some could go further and claim that almost every day there are new estimates of the rates of

returns to education, but for a whole host of reasons, only few of these can be considered as being realistic, (Heckman, Lochner, & Todd, 2006).

Starting with Mincer's model, it has been stated that the levels and the differences in individual log-earnings in a competitive labour market depend to a large extent on the differences in human capital,(Söderbom & Teal, 2001). In his formulation, Mincer assumes that at any point of an individual's lifetime t, the observed earnings [the potential earnings $wK(t)$ – human capital investment $(1-s(t)K(t)]$ can be represented as a concave function of worker's labour market experience, (Polachek, 2008). On the assumption that the schooling investment would last for S years and on-the-job training is expected to decrease over time, the most widely used quadratic function of log-earnings or what is often referred as the Mincer earnings function (regression) can be expressed as:

$$\ln Y_i(t) - a_0 + a_1 S_i + a_2 t_i + a_3 t_i^2 + c_i \dots\dots..(1)$$

Or can be written as;

$$\ln[Y(s,x)] = \alpha + \rho_s s + \beta_0 x + \beta_1 x^2 + \varepsilon \dots\dots..(2)$$

Where:

$$Y(t) = wK(t) - s(t)K(t)$$

$Y(s,x)$ is the wage at schooling level s and work experience x.

a_0 or α is the initial earnings capacity.

a_1 or $\rho_s$is the return rate on education. Which assumed to be the same for all the levels of schooling.

a_2 and a_3 are the related to the amount and the financial returns to on-the-job training.

ε_i is a mean zero residual with $E(\varepsilon|s,x) = 0$.

It should be noted in this fraction that the log-earnings quadratic form of Mincer's function has been criticized by some scholar, (Murphy & Welch, 1990), (Heckman, Lochner, & Todd, 2003). It is argued that the quartic function is more appropriate than the quadratic one, because the increase in earnings that can be attributed to the schooling needs is not independent of the accumulated schooling and experience that a worker already acquires. In other words, using Current Population Survey data from 1964 to 1987, they found that a quadratic function is not as enough as flexible so as to capture the main features of the experience-earnings profile. The key aspect of this argument is that the quadratic function understates the growth in earnings over the first 10 to 15 years of career, while by way of contrast, they reached a conclusion that the quartic function in years of experience very well captures the fundamental constituents of the empirical experience-earnings profile, (Lemieux, 2006).

In order to make the function more comprehensive, Mincer inserts some specifications into it. For instance, he assumes that the earnings of a worker in the initial period can be calculated based on the following formula:

$$E_1 = E_0 + rC_0 \dots\dots..(3)$$

Where; C_t in general, represents the amount of dollars that worker pours into investing in human capital in time t.

Regarding the above formula elements;

E_1 refers to the earnings in the period one.

E_0 demonstrates the potential earnings of an individual based on the innate ability which is denoted by $wK(0)$.

Equivalently;

$$E_2 - E_1 + rC_1 = E_0 + rC_0 + rC_0 \dots\dots\dots(4)$$

By way of summary, the above equation can be rewritten as;

$$E_t = E_0 + r\sum_{i=0}^{t=1} C_i \dots\dots\dots(5)$$

Since it is not empirically straightforward to collect data on the amount of money one may invest in human capital, Mincer attempted to use the $k_t = \frac{C_t}{E_t}$ so as to express the proportion of worker's earnings that he decides to channel in human capital investment. Using this proportion, the percent of time that a worker spends on investing in human capital can be estimated.

In Ben-Porath model (1967), $Y(t) = [1 - s(t)]wK(t)$. Where $s(t)$ (which also represents the time spent on investing in human capital) is equivalent to k_t.

If we substitute k_t for C_t we obtain;

$$E_t = E_0 \prod_{i=0}^{t=1}(1 + rk_t) \dots\dots\dots\dots(6)$$

And with the logarithmic form, it would look like this;

$$\ln E_t = \ln E_0 + \sum_{i=0}^{t=1} \ln(1 + rk_t) \dots\dots\dots(7)$$

Where $\ln(1 + rk_t)$ is approximately equal to $\approx rk_t$.

And if rk_t is tiny, the above equation can be expressed as;

$$\ln E_t = \ln E_0 + r\sum_{i=0}^{t=1} k_t \dots\dots\dots\dots\dots(8)$$

In 1945, Friedman and Kuznets estimate the profitability of investments in human capital using earnings streams and the approach of the net present value computed at a 4% discount rate, (Friedman & Kuznets, 1945). Whilst in 1962 Mincer the formula of the net present value has been switched into a ratio of a constant stream of benefits received relative to the cost of investment in order to estimate the rate of returns from on-the-job training, (Mincer, 1962). In econometric models and based on strong theoretical rationale; logs are widely used for a whole host of reasons of convenience or fitness. Mincer pointed out that education should have a multiplicative effect on human capital in a simple model where individuals seek to maximize the present value of their future income for all the levels of education. However, why is it the case that this is likely to happen? Due to the fact that investments in human capital are as the same as any other investments that are very likely to be proceeded if only the investors expect that the rate of return would exceed the discount rate. Drawing on that, the log-linearity of earnings as a function of years of schooling that has been proposed by Mincer in 1958 is considered as the key empirical work of the human capital model for identical individuals, (Mincer, 1958).

According to the hypothesis for the consumer demand mechanism, urban areas have complementary relationships with high-skilled workers and increasing returns to human capital. To put it another way, urban amenities may have an impact in terms of luring, as well as tempting, growing numbers of highly-educated and gifted labour forces to settle there, (Kaplanis , 2010). This would,in effect,encourage the further growth of spending and consumption, by this group of highly-educated and highly-skilled workers (in absolute and relative terms alike), on the services in cities (such as spending on restaurants, cleaning, and security), in comparison with other income and education groups, (Leonardi, 2003), (Leonardi

,2010). In addition, most of workers within these services tend to be low-paid when compared to other workers in other sectors in the economy. Moreover, given the fact that these services are characterised as labour intensive thence human performance cannot be easily substituted by technology, therefore, the demand for relevant low-skill services vocations will tend to rise. Another crucial factor is the physical nearness of the high-income workers, and the low-pay services sectors which are required due to the reality that their products need to be locally produced and consumed, on account of the fact that they are non-traded.

In brief, the hypothesis of the consumer demand mechanism is likely to cause more polarisation to happen, in the different urban areas and cities, with a reliance on the percentage of growth in the number of highly-skilled workforces.Alternatively, there is another explanation to the wage effects, in which it is relevant to production complementarities between the group of low-skilled and the group of highly-skilled labour. It is argued that the formal and informal interaction between workers can have positive external impacts on human capital and productivity, (Lucas, 1988). Some research has been centred on the source of these externalities, and it has attempted to examine, for instance, the interactions between firms and workers in the workplace or in the level of the city, and how such a synergy can spur productivity,(Ciccone & Hall, 1993). It is also claimed that the agglomeration of firms, in certain urban areas, can bring some benefits due to the economies of scale, and the availability of production factors; and specifically, where highly skilled human capital is coupled with the communication interactions where these firms are located, which in turn fosters productivity, (Duranton, 2006), (Charlot & Duranton, 2004).

In his two *investment in human beings* 1962 and *human capital* 1964 pioneering studies on human capital, G. Becker demonstrated the strength of human capital approach in comprehending the human capital investment theory, and the determinants of earnings, (Chiswick, 2006). In 1964 G. Becker introduced the internal rate of return to schooling concept as being a cornerstone of human capital theory, which signals the relative profitability of investment in education compared to other sorts of investments, (Heckman et al., 2006). Empirically, the few estimates of the rate of returns to a large extent concentrate on the college-high school wage differential while they ignore the necessary constituents in order to obtain the rate of return.

However, Mincer's formulation used to be as follows;

$$d/c = (1+r)^n \ldots\ldots\ldots\ldots (9)$$

Where; d is the increment in earnings form an alternative job after finishing the training time.

c is the cost of investment calculated through the annual foregone earnings during the training time.

r is rate of return from the investment.

n is the number of the years of training.

A few years later, in 1966, Becker and Chiswick devised a new approach in order to appropriate the human capital returns as a means to find out and distinguish the determinants of the earnings distribution in terms of inequality and skewness, (Becker & Chiswick, 1966). However,and having said that, understanding pivotal issues in labour market mainly necessitates distinguishing and pinpointing the decisive relationship between wages and the marginal productivity. This implies the returns to education and training, the race and gender wage discrimination, and the prime mover of the wages rising over the life cycle,(Turcotte &

Rennison, 2004). In consistency with this, it is widely recognised that the relative ameliorations in years of schooling and the quality of schooling are believed to have played major role in bolstering as well as strengthening the advancement of the economic status of black citizens in the United States over the second half of the 20th century, (Heckman, Lyons, & Todd, 2000).

3. Methodology

The concept of descriptive analytical approach (filed of descriptive analytical approach) has some important features, which may make it a choice for many researchers in the research of various phenomena. Through the use of descriptive analytical approach, the scientific researcher can gather some of the most accurate and clear information about the phenomena in scientific research, which is one of the most important features that may lack the descriptive method, which is devoid of analytical nature.

It also provides all the events and information experienced by the researcher during the research process, and a detailed and real account of all scientific procedures that took place during the descriptive analytical approach.The causative news may be one of the most important advantages of the concept of descriptive analytical approach (filed of descriptive analytical approach), it is also one of the important advantages in the use of this scientific method.The traditional descriptive approach was limited to the study of some phenomena that take a social and human nature, but the concept of descriptive analytical approach (filed of descriptive analytical approach) has more enabling mechanisms, through which it can study more topics in scientific research.It is able to clarify the relationships between variables and different phenomena, and is also able to detail the different comparisons between those phenomena, and discover the differences and similarities in detail, which is one of the functions characterized in the performance of the descriptive analytical approach.

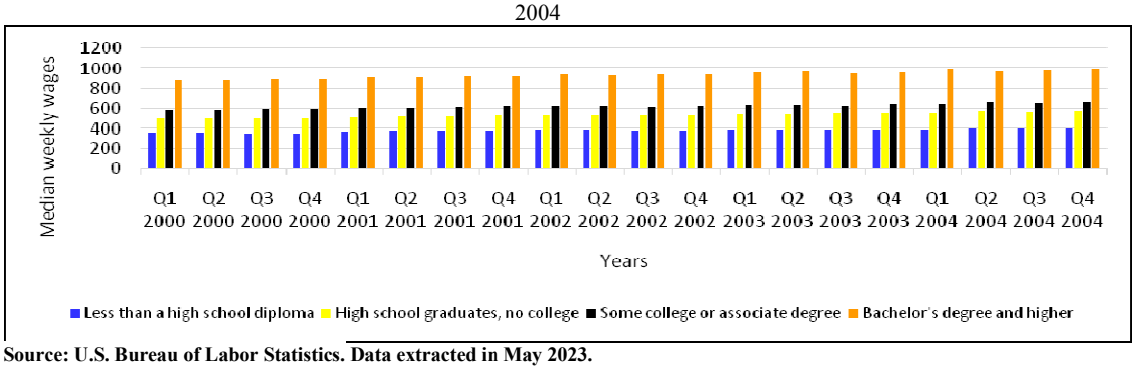
Descriptive analytics is the first step in data analysis. The goal of descriptive analytics is to find out what happened in the past! It's the first layer of information that a researcher can obtain from the data collected, either with or without adding data from other sources. Researchers and analysts, might not know in detail, or at all, what happened that led to the dataset that they need to analyze. If this is the case, it is important to seek out context on the selected sample and the population it was drawn from.The descriptive analytical approach involves parsing and breaking down) data and summarizing its main features andcharacteristics. It uses basic descriptive statistics. This includes measures of distribution (frequency or count), central tendency (mean, mode, and median), and variability (such as variance and standard deviation). Where relevant, it also measures the position of various data points, including the interquartile or percentile range.

4. Diagrammatic Representation and Descriptive Analysis

For decades education has increasingly become a pivotal factor in the process of strengthening the competitive advantages of countries and companies alike worldwide. It does not only raise the income levels of both countries and individuals, it also expands the frontiers of awareness and comprehension of the global challenges beyond imagination, opening up new opportunities, offering new horizons for people, and creating prospects. That is why the study of the relationship of education and incomeis relevant and timely. Based on the figures extracted in May 2023, form the Bureau of Labor Statistics, BLS, it can be marked that the median weekly wages of those who obtained bachelor's degree and higher rose by 12.42% over the years from 2000 to 2004. Whereas, those with college and associate degrees has seen

their weekly pay rise with 13% over the 4-year period. As for the median weekly wages of high school graduates, it increased by 15% from 503 US$ by the end of the 1st quarter of the year 2000 to 581 US$ at the end of the 4th quarter of the year 2004.

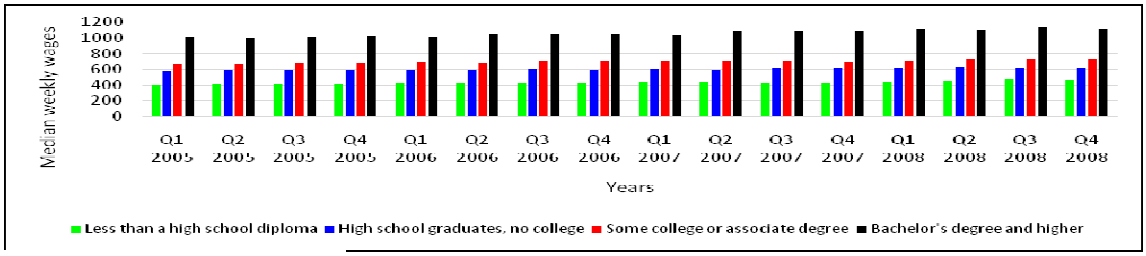
Figure (1) The median usual weekly earnings of full-time wage and salary workers by educational attainment 2000-2004



Source: U.S. Bureau of Labor Statistics. Data extracted in May 2023.

It is also worth mentioning that the weekly wage gap between those with Bachelor's degree and higher and with high school graduates increased from 383 US$ per week in the 1st quarter in 2000 to 415 US$ per week in the 4th quarter in 2004, and it widened to 434 US$ in the 1st quarter in 2005.During the period from 2005 to 2008, the median weekly wages of the Bachelor's degree holders improved by 10.1% from 1013 US$ per week to 1115 US$. Whereas the median of weekly wage of those with less than a high school diploma increased by 13.62% over the stated period between the 1st quarter in the year 2005 and the 4th quarter in the year 2008. As for the high school graduates and those with some college or associate degree, their median weekly wages increased by 7.80% and 6.90% respectively during the same period. The pay gap between the bachelor's degree holders and the high school graduates during the stated period had also escalated from 434 US$ in the 1st quarter in 2005 to 496 US$ in the 4th quarter in 2008.So, what explains this strong link between education and income? There are a few key reasons. First, educated individuals tend to have better job prospects than those without a college degree.They are more likely to get hired for jobs that offer higher salaries and they are less likely to experience unemployment. Second, even within the same occupation, those with more education often earn more money than their less-educated counterparts. This is because employers are willing to pay workers with specialized skills or knowledge a premium for their expertise.Finally, employers often prefer to hire more educated workers because they believe they will be more productive and loyal employees.

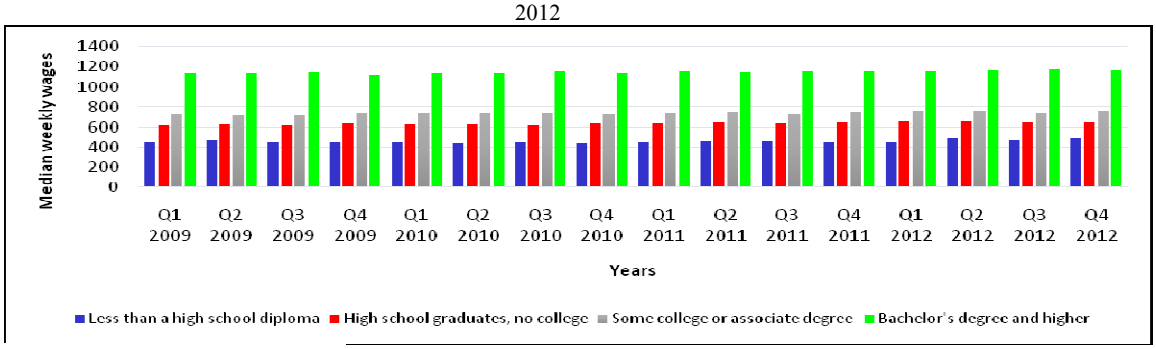
Figure (2) The median usual weekly earnings of full-time wage and salary workers by educational attainment 2005-2008



Source: U.S. Bureau of Labor Statistics. Data extracted in May 2023.

As noted in the World Bank report [1] technology is rapidly changing the way of which the set of skills needed in the work environment. Technological advancements worldwide have been for decades affecting the demand for less advanced skills in a negative way. This is where less-skilled workers are no longer on high demand because their jobs can be replaced by certain kinds of technology. At the same time, the very same technical innovations had positively affected the demand for advanced cognitive skills, and sociobehavioral skills. This pattern of change is already in place in the vast majority of the developed economies, and is picking up pace in some major developing economies.

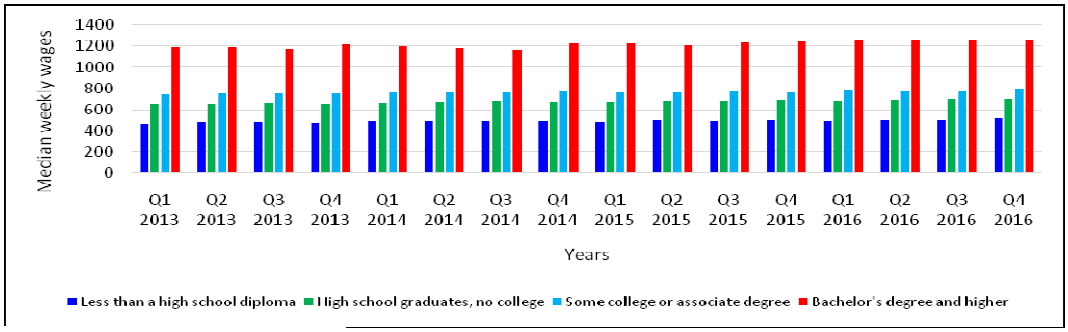
Figure (3) The median usual weekly earnings of full-time wage and salary workers by educational attainment 2009-2012



Source: U.S. Bureau of Labor Statistics. Data extracted in May 2023.

During the period from 2009 to 2012, the median weekly wages of the Bachelor's degree holders slowed down and grew only by 2.6% % from 1038 US$ per week during the 1st quarter of 2009 to 1168 US$ during the 4th quarter in 2012. Whereas the median of weekly wage of those with less than a high school diploma increased by only 3.58% over the stated period. As for the high school graduates and those with some college or associate degree, their median weekly wages increased by 4.35% and 6.22% respectively during the same period. These modest improvements and slow growth in the weekly earnings of full-time workers can be partly put down to the financial crisis that hit the U.S. economy during the period from 2007 to 2009. Which also affected the labour market and occupational development in the U.S. economy in a negative way.

Figure (4) The median usual weekly earnings of full-time wage and salary workers by educational attainment 2012-2016

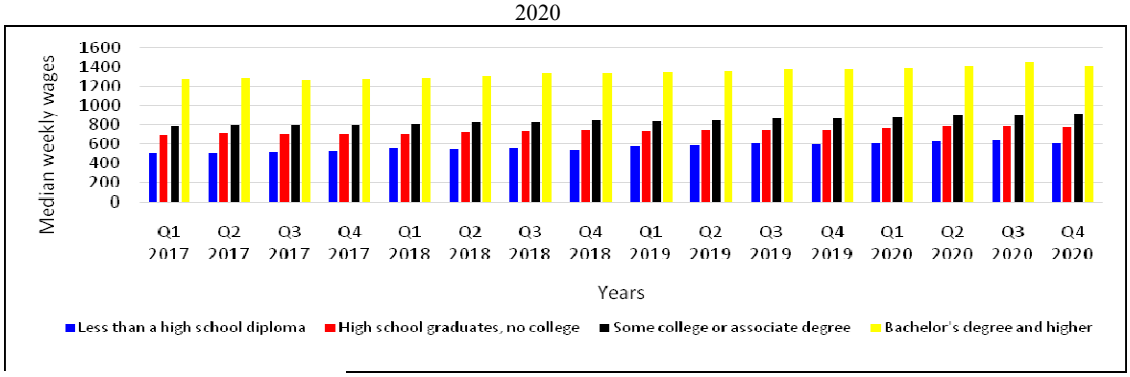


Source: U.S. Bureau of Labor Statistics. Data extracted in May 2023.

[1] The World Development Report 2019. The Changing Nature of Work (2019), http://documents.worldbank.org/curated/en/816281518818814423/pdf/2019-WDR-Report.pdf.

It can also be marked that the weekly median earnings during the period from the 1st quarter in 2013 to the 4th quarter in 2016 improved by 6.82% compared to the previous period as the U.S. economy and the labour market started to recover from the 2007-2009 financial crisis.

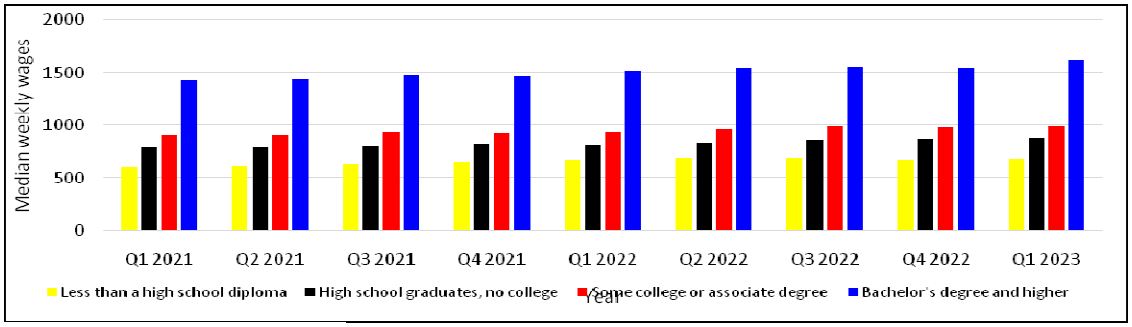
Figure (5) The median usual weekly earnings of full-time wage and salary workers by educational attainment 2017-2020



Source: U.S. Bureau of Labor Statistics. Data extracted in May 2023.

The education importance should not be underestimated, due to the fact that it is interconnected with all spheres of the economy and society. However, having said that, the education economic value does not rely only on its level, but also on the institutional environment that is desperately needed to implement it. This is where the low quality of the institutional environment and weak formal institutions will result in the emergence of corruption. Therefore, it can be said that corruption can be regarded as an indirect indicator of the poor quality of the institutional environment in any nation across the globe. And it certainly has a negative impact on existing institutions, and the educational institutions included.

Figure (6) The median usual weekly earnings of full-time wage and salary workers by educational attainment 2021-2023



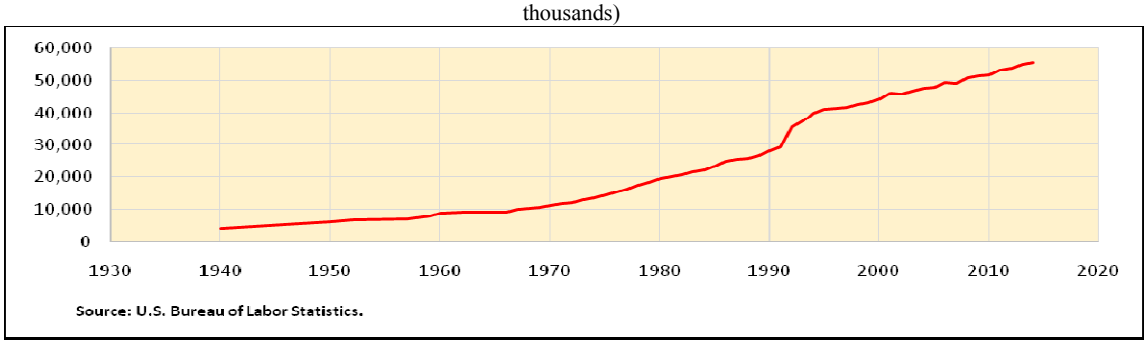
Source: U.S. Bureau of Labor Statistics. Data extracted in May 2023.

Median weekly wages of Bachelor's degree holders rose significantly by 13.67% from the 1st quarter of 2021 to the 1st quarter of 2023. As for high school graduates, the average weekly earnings increased by 11.61% over the same period, while those with less than a high school diploma earned 613 US$ in the 1st quarter of 2021, and earned 682 US$ by the end of the 1st quarter of 2023 with a 11.26% increase during the 3-year period.

5. Educational Attainment and Years of Schooling in the United States during the period from 1940 to 2014: Historical Perspective

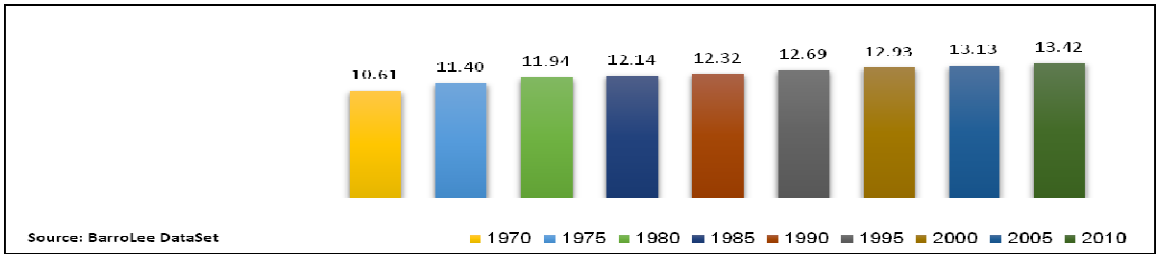
The well-established evidence on the strong relationship between education and income appears to be substantive, meaningful and robust. This is where people with higher levels of educational attainment tend to earn more money than those with lower levels of education. This is because highly-educated individuals tend to have better job prospects and are more likely to be employed in high-paying jobs.Thereasons for why this relationship exists can vary from one individual to another, one subject to another, and from one country to another. In general, better educated peopleusually have the set skills and knowledge that is required by employers in the job market.

Figure (7) Students (aged 25+) who completed 1 to 3 years or more in college in the US between 1940-2014 (numbers in thousands)



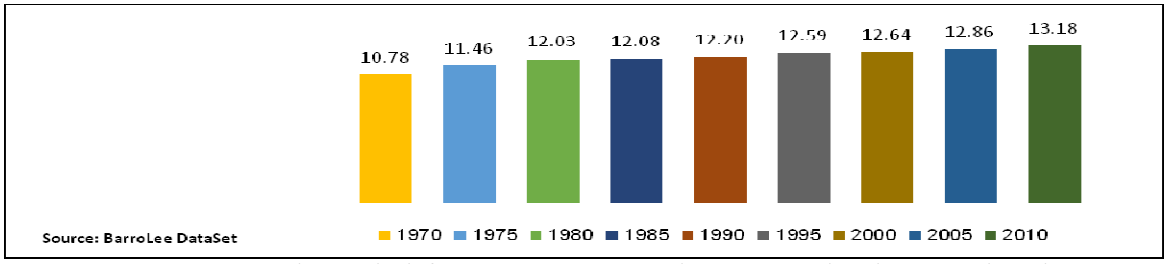
Individuals with higher degrees are able to communicate effectively, which can help them to be more productive in the workplace. Also, better educated workers tend to be more motivated and committed to the tasks assigned to them, which can lead to higher earnings as a result of higher productivity and efficiency. Las but not least, highly-educated individuals tend to work in industries and occupations that pay better than those with lower levels of education. In addition to education, there are other factors that can influence earnings. For instance, experience, job type, and location can also play significant role in determining the level of individual's earning.

Figure (8) The average years of schooling for the age group (25+) in the U.S.A during the period between 1970 and 2010



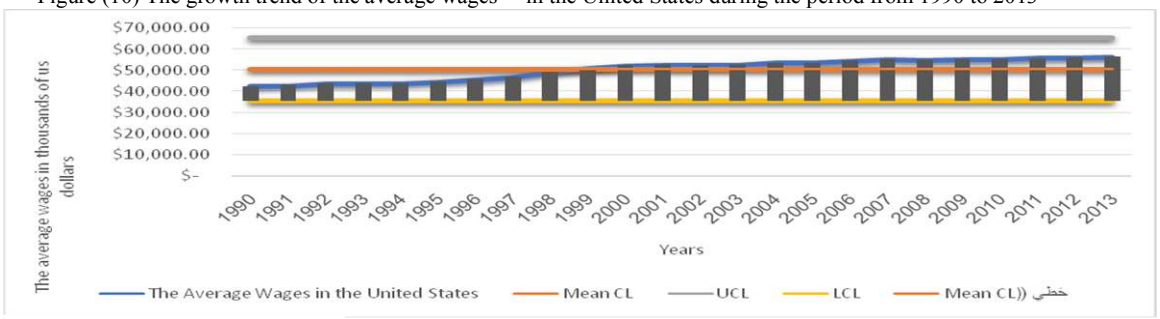
It is can be seen from the above graph the considerable improvement in the number of students in this age group (25+) who studies from 1 to 3 years in college throughout the period of the 1990s between 1990 and 2000. Where it was 28.075 students in 1990 and it jumped to 44.445 student in 2000, which is approximately double the figures. Whereas The number of students who completed 4 years in college had experienced a steady increase during the period 1940-2014.

Figure (9) The average years of schooling for the age group (15+) in the U.S.A. during the period between 1970 and 2010



However, over the period from 1970 to 2010, it seems to be the case that the average years of schooling for the group age (+25) steadily increased from 10.61 years to 13.42 years over the 40-year period. The same analysis can apply to the group age (+15) over the same period.

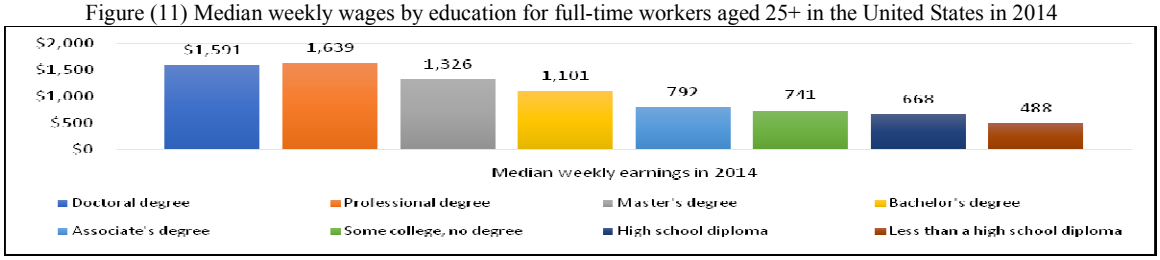
Figure (10) The growth trend of the average wages [2] in the United States during the period from 1990 to 2013



Source: U.S. Bureau of Labor Statistics.

As is shown in the figure below, in 2014 the median weekly wage for those with professional degreetowered above all other levels of education with 1639 US$ per week in 2014. While those with doctoral degree earned 1591 US$ per week. On the other hand, it can be noticed that those with Master's and Bachelor's degree earned 1326 US$ and 1101 US$ per week respectively in the same year. Whereas those with who completed high school diploma and those with less than high school diploma trailed behind with average weekly wages 668 US$ and 488 US$ respectively.

Figure (11) Median weekly wages by education for full-time workers aged 25+ in the United States in 2014



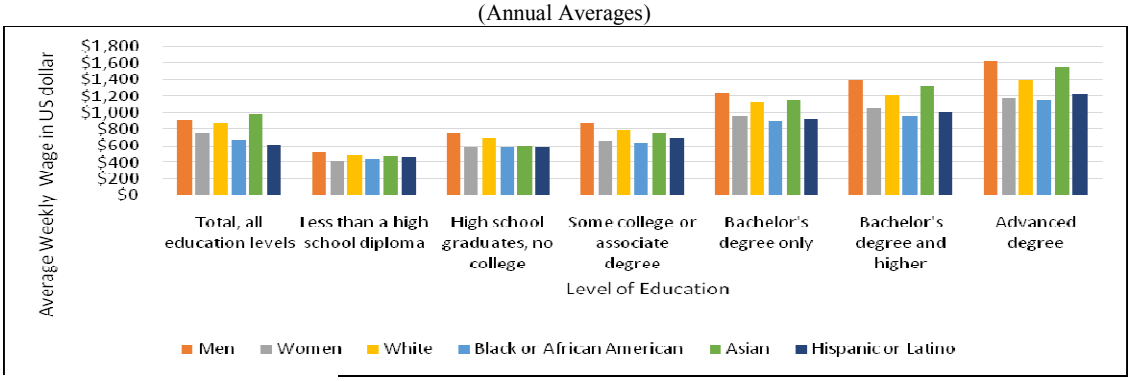
(2) **Notes:**

1. **According to the BLS:**
2. **A Mean Wage is: an average wage.**
3. **An occupational mean wage estimate is calculated by summing the wages of all employees in a given occupation and then dividing the total wages by the number of employees.**
4. **A percentile wage is: a boundary. For instance, an occupational median wage *(50th percentile*) estimate is the boundary between the highest paid *50%* and the lowest paid *50%* of workers in that occupation. Half of the workers in a given occupation earn more than the median wage, and half the workers earn less than the median wage.**
5. **What are Percentile Wages?**
6. **The percentile wage estimate is the value of a wage below which a certain percent of workers falls.**

Source: U.S. Bureau of Labor Statistics.

It appears from the below figure that as the level of educational attainment improves it results in a higher average wage. Another issue to observe is the wages differentials between genders and race or ethnicities. It can be seen that the average wage of men (922 USDs per week) in tends to be higher than in the case of women (752 USDs per week) at all different education levels.

Figure (12) Median weekly earnings of full-time wage and salary workers, aged 25+ by educational attainment, 2014 (Annual Averages)

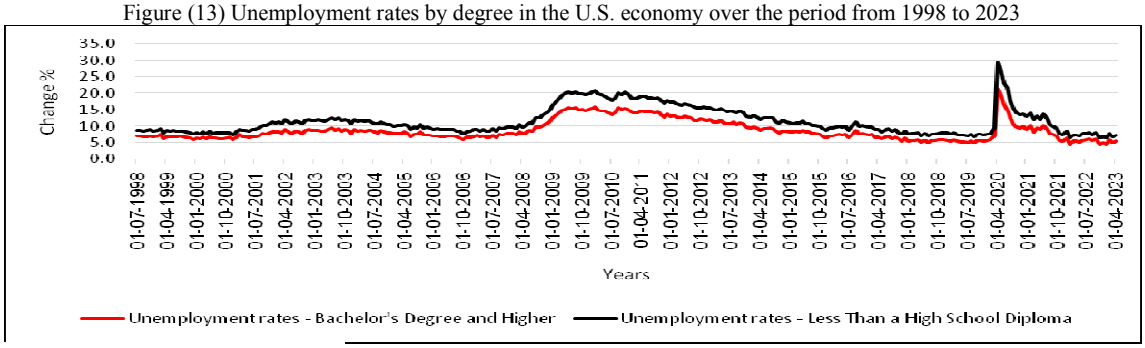


Source: U.S. Bureau of Labor Statistics.

On the other hand, and when it comes to races and ethnicities, it seems that the average wages of Asian are higher than the average wage of White in the levels of Bachelor's degree (1,149 USDs per week), Bachelor's degrees and higher (1,328 USDs per week), and Advanced degrees (1,562 USDs per week) respectively compared to the levels of education Less than high school (493 USDs per week), High school (696 USDs per week), and some college or associate degrees (791 USDs per week) , where the reverse is true. In the third highest average wage comes the Black or African American with (674 USDs per week), and then the Hispanic or Latino with (619 USDsper week) in total at all education level, but with closer glimpse and in more details at different levels of education it can be noticed that the Hispanic and Latino gain higher average wages than the Black and African American.

There seems to be a significant relationship between income, gender, and education. Women with higher levels of education tend to earn more than men with comparable levels of education. However, women still earn less than men on average. This difference is even greater for women of color. There are many factors that contribute to the earnings gap between men and women. One major factor is that women are more likely to take time off from their careers to care for children or elderly relatives. This can lead to a loss of earnings and career development in the future. Similarly, women are often segregated into lower-paying occupations and industries. In addition, discrimination and prejudice continue to play a role in limiting women's earnings potential. The existing wage gaps between men and women at all educational attainment levels appear to have serious economic and social ramifications in the American society, and paying more attention to it and making the needed efforts to closing it would have major economic and social benefits for families, businesses, and the economy as a whole. It would also help to reduce poverty rates and improve social mobility.

Figure (13) Unemployment rates by degree in the U.S. economy over the period from 1998 to 2023



Source: U.S. Bureau of Labor Statistics.

In the current economy, there is a strong relationship between education and unemployment. Individuals with higher levels of education are more likely to be employed than those with lower levels of education. This relationship exists because employers are looking for workers who have the skills and knowledge necessary to perform the job. According to the Bureau of Labor Statistics, in 2019, the unemployment rate for people with a bachelor's degree or higher was 2.2%, while the unemployment rate for people without a high school diploma was 5.3%. There are several reasons why there is such a strong relationship between education and unemployment. First of all, more educated workers tend to have better job skills and be more qualified for positions. They also tend to be more adaptable and able to learn new things quickly, which makes them less likely to become unemployed.Individuals with higher levels of education typically have the necessary skills and knowledge to perform the job better than those with lower levels of education. According to U.S. BLS, in November 2016, the overall U.S. unemployment rate was 4.6 %, but level of education matters. The unemployment rate for college graduates was 2.3 %, while that for those with less than a high school diploma was 7.9 %.

The relationship between education and unemployment also exists because individuals with higher levels of education are more likely to look for work than those with lower levels of education. When individuals are unemployed, they often stop looking for work altogether. However, individuals with higher levels of education are more likely to continue searching for employment even when jobs are scarce. This persistence eventually pays off, as these individuals are more likely to find a job that matches their skills and qualifications. In conclusion, there is a strong relationship between education and unemployment. Workers with higher levels of education are more likely to be employed than those with lower levels of education.

6. Conclusions

To sum up, thestrong relationship between education and income is well-established from an empirical point of view across countries. It implies that those with higher levels of education tend to earn more money than those with less education. This is due to the fact that better educational attainment provides people with the skills and knowledge which are crucially needed in the workforce to succeed in performing the task with best efficiency level possible.Despite all that, there seems to be no guarantee that all individuals who are highly-educated will earn a high income, but it remains one of the best ways to increase the chances of doing so. Therefore,improving the education level can be a necessary condition and a smart choice than one can make in order to improvingthe earning power, yet it cannot a sufficient condition to do so.

Education does offer access to many well-paying careers. The median annual earnings for those with a bachelor's degree are nearly double that of those with only a high school diploma. Moreover, those with advanced degrees, such as: Master's and PhD, typically earn even more than those with only a bachelor's degree.However, and having said that, it is important to note that the cost of pursuing a higher education can be a significant factor in the process of making the decision of whether to work or study. The average cost of tuition and fees at a public four-year university seem to have risen significantly in recent years in the U.S. and across many countries in the world, making it difficult for some families to afford college without taking on substantial debt.

7. References

1. Becker, G. S., & Chiswick, B. R. (1966). Education and the Distribution of Earnings. The American Economic Review, 358-369.
2. Charlot, S., & Duranton, G. (2004). Communication externalities in cities. Journal of Urban Economics, 56(3), 581-613.
3. Chiswick, B. R. (2006). Jacob Mincer, experience and the distribution of earnings: Springer.
4. Ciccone, A., & Hall, R. E. (1993). Productivity and the density of economic activity. Retrieved from
5. Crepon, B., Deniau, N., & Perez-Duarte, S. (2003). Wages, productivity and worker characteristics: A French perspective: INSEE.
6. Dearden, L., Reed, H., & Van Reenen, J. (2000). Who gains when workers train? Training and corporate productivity in a panel of British industries
7. Duranton, G. (2006). Human capital externalities in cities: Identification and policy issues. A Companion to Urban Economics. Oxford: Blackwell Publishing Ltd.
8. Ferguson, C. E. (2008). The neoclassical theory of production and distribution. Cambridge Books.
9. Friedman, M., & Kuznets, S. (1945). Income from individual professional practice. National Bureau for Economic Research, New York.
10. Heckman, J. J., Lochner, L. J., & Todd, P. E. (2003). Fifty years of Mincer earnings regressions: National Bureau of Economic Research.
11. Heckman, J. J., Lochner, L. J., & Todd, P. E. (2006). Earnings functions, rates of return and treatment effects: The Mincer equation and beyond. Handbook of the Economics of Education, 1, 307-458.
12. Heckman, J. J., Lyons, T. M., & Todd, P. E. (2000). Understanding black-white wage differentials, 1960-1990. American Economic Review, 344-349.
13. Kaplanis, I. (2010). Wage effects from changes in local human capital in Britain.
14. Lemieux, T. (2006). The "Mincer equation" thirty years after schooling, experience, and earnings: Springer.
15. Leonardi, M. (2003). Product Demand Shifts and Wage Inequality.
16. Leonardi, M. (2010). The Effect of Product Demand on Inequality: Evidence from the US and the UK.
17. Lucas, R. E. (1988). On the mechanics of economic development. Journal of monetary economics, 22(1), 3-42.
18. Mankiw, G. (2010). Macroeconomics, Worth, New York
19. Mincer, J. (1958). Investment in educational attainment and personal income distribution. The Journal of Political Economy, 281-302.
20. Mincer, J. (1962). On-the-job training: Costs, returns, and some implications. The Journal of Political Economy, 50-79.
21. Mincer, J., & Polachek, S. (1974). Family investments in human capital: Earnings of women Marriage, family, human capital, and fertility (pp. 76-110): NBER.
22. Murphy, K. M., & Welch, F. (1990). Empirical age-earnings profiles. Journal of Labor economics, 202-229.
23. Polachek, S. W. (2008). Earnings over the life cycle: The Mincer earnings function and its applications: Now Publishers Inc.
24. Sheffield, J. (2013). Contending Theories of Wage Determination: An Intersectoral Analysis of Real Wage Growth in the US Economy. Pursuit-The Journal of Undergraduate Research at the University of Tennessee, 4(2),4.
25. Söderbom, M., & Teal, F. (2001). Firm size and educational attainment as determinants of productivity and earnings: United Nations Industrial Development Organization.
26. Tchernis, R. (2010). Measuring educational attainment and its effects on wage growth. Journal of Economic Surveys, 24(2), 362-387.
27. Turcotte, J., & Rennison, L. W. (2004). Productivity and wages: Measuring the effect of educational attainment and technology use from linked employer-employee data.