

# **Is the Low Wage Competitive Advantage for Attracting FDI? An Econometric Study**

"Productivity isn't everything, but in the long run it is almost everything."  
-Paul Krugman, *The Age of Diminished Expectations*, 1990

**Sonjoy Chakraborty**

## ***Abstract***

It is well known to all that the low wage is the competitive advantage for attracting more FDI. This study shows that the relationship between wage rate and inflow of FDI is direct, that is, low wage is the hurdles for attracting FDI. Low wage is the indicator of social unrest, political instability, instability of political regime and also instability of economic policy. On the other hand low wage rate is the sign of low productivity not the competitive advantage for the inflow of FDI, rather high wage, if it is justified by the productivity, is comparative advantage for attracting FDI.

**Key Words:** FDI, Low Wage Rate, FDI-Population Ratio

## **1. Introduction**

It is generally assumed that there is a negative relationship between Wage rate and inflow of FDI, that is, in a country where wage rate is low, more DFI will inflow there. In this context, the Least Developed countries (LDC) are very much optimistic that these countries will be able to attract more FDI as wage rates are significantly low. In the low income level countries, it is very much tough to increase savings-GDP ratio for rapid economic development. Foreign direct investment (FDI) is an important source of private capital for the LDC's and developing countries for the fulfillment of the required investment. With the low level of domestic savings and loans to the allocation developing nations declining, the role of FDI as a source of private capital for the low-income nations is on the increase (Asiedu, 2002). FDI not only stimulates employment but also is seen as a means of acquiring new technology, improved business management practices and market access to the developed world (Noorbakhsh, Paloni and Youssef, 2001). But instead of low wage rate, LDCs fail to attract substantial amount of FDI comparing the countries of high wage rate. The paper argued that the low wage is not the competitive advantage for attracting FDI, rather low wage is the hurdles for attracting FDI.

## **2. Review of the Previous Work**

Onwuka, Kevin Odulukwe (2011) shows that low wage rate, together with low employment level, is still driving force in attracting FDI into ASEAN countries. Human capital, low wage rate and employment remain a source of competitive advantage in the ASEAN countries. The low wage rate and employment, in fact, do still provide a base for sustainable development in ASEAN region considering the fact that some members are in low to middle income bracket.

F. C. Robert, H. H. Gordon (1995), argued that FDI is positively correlated with the relative demand with the skilled labour.

\*Sonjoy Chkaraborty, MSS (Economics) First Class, Ph. D. (Research Fellow), Deputy Director (Research and Development), BOI, Prime Misister's Office

Arbache J. S.,(2004), in his paper investigates the impact of FDI on the labor market in Brazil. He finds that foreign firms are more skill-intensive than national firms by employing better educated and more experienced workers; that multinationals pay a wage premium; and that FDI impacts human capital formation. These findings suggest that there are spill-over effects of foreign capital on the labor market.

Parcon, H., (2008), presents in his paper that Labor market regulations and standards decrease FDI inflows through the cost channel, but they increase FDI inflows through the productivity channel.

### **3. Objective of the Paper**

The objective of this paper is to find out the relationship between wage rate and inflow of Foreign Direct Investment.

### **4. Methodology and Data Sources**

The methodology includes econometric modeling and simple statistical tools. This paper is primarily based on secondary information. Internet resources from various websites had been facilitating in locating and gathering data. The relevant secondary data are collected from World Investment Report 2014 published by UNCTAD, World Bank, various survey, websites, journals, Working Papers, books and newspapers etc. These data has been analyzed to establish the relationship between wage rate and inflow of FDI.

### **5. Paradox of Factor Price Equalization Theory**

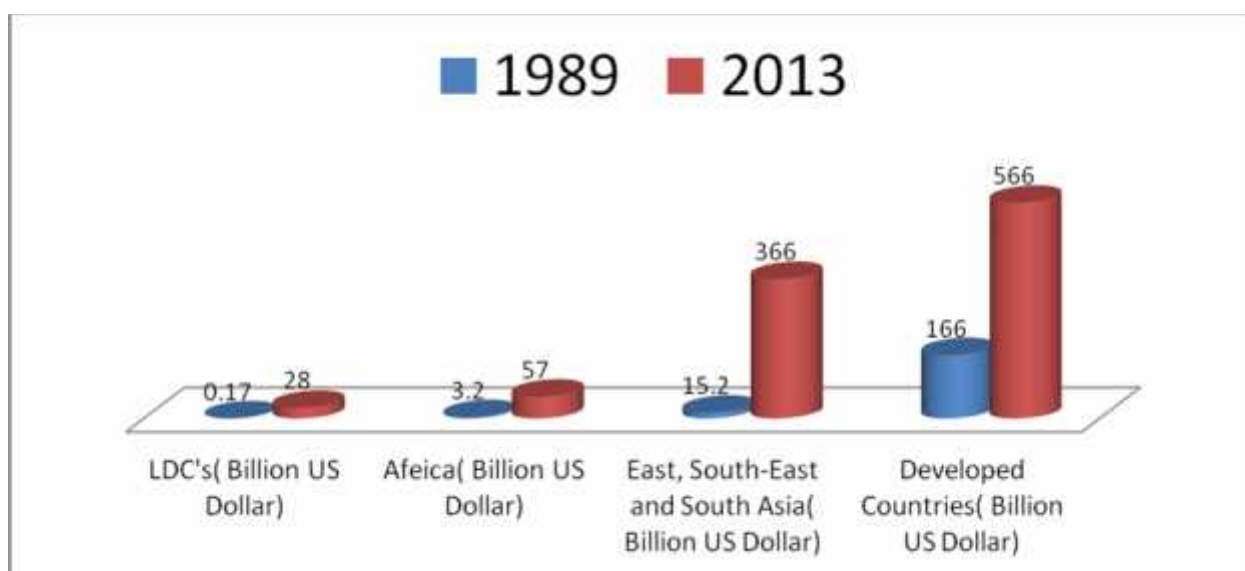
Heckscher–Ohlin and Paul A. Samuelson both are mostly famous for their factor price equalization trade theory. Before them, Adam Smith and David Ricardo have given the absolute and relative advantage trade theory respectively and argued that a country will produce and export capital intensive commodity if the country is capital abundant in the context of absolute or relative sense and vis-a-vis and in this way global production will increase and both the country will be benefited after trade. But Smith and Ricardo did not extension their theory about factor price equalization.

Factor price equalization is an economic theory, by Heckscher(1919)–Ohlin(1933) and Paul A. Samuelson (1948), which states that the prices of identical factors of production, such as the wage rate, or the return to capital, will be equalized across countries as a result of international trade in commodities. Simply stated the theorem says that when the prices of the output goods are equalized between countries as they move to free trade, then the prices of the input factors (capital and labor) will also be equalized between countries and it will also increase competition, efficiency, the global utility through optimum utilization of factors. The theory also states there should be reverse relationship between capital flow and wage rate. That is, in a country where wage rate is low more capital will inflow there. But unfortunately, in this study we have got that, the correlation between net FDI and wage rate per hour is positive (0.379) which is significant at 1% level where 116 country (2013 year's data) has been considered.

## 6. Scenario of the World Inflow and Outflow of FDI and Wage Rate

At the end of the Cold War in the early 1990s in a new political dynamics, LDCs become heavily dependent on foreign public aid regardless of their political ideological learning, to find out alternative sources of foreign private capital. Trends in information and communication technologies (ICT) and globalization have also resulted in greater integration of capital markets easing the flow of capitals across the globe. As a result, According to WIR, 1991 and 2014, the annual FDI inflows to LDC's increased from \$0.17 billion in 1988-89 (0.1% of global share) to about \$28 billion (1.9% of global share) in 2013 and the FDI inflows to East, South and South-East Asia was only \$15.20 billion (8.8% of global share) and \$3.20 billion (1.9% of global share) in Africa in 1988-89. But in 2013 the FDI inflows to East, South and South-East Asia become \$366 billion (27.5% of global share) and \$57 billion (3.9% of global share) in Africa. On the other hand, Developed countries received \$166 billion FDI in 1988-89 and \$566 billion FDI in 2013.

**Figure-1: Comparison of Inflow of FDI in Developed and Under-developed Region**



The above figure shows that, between the gap of 24 years, very small absolute amount of FDI increases in the under-developed region where wage rate is very low compared to developed and developing countries.

Table 1 provides a clear picture about the inflow and outflow of FDI. Transition and LDCs Receipts only 7 % FDI and the interesting point is that in 2013, three largest FDI recipient countries are: USA (188 Billion US Dollar), China (124 Billion US Dollar), Russian Federation (79 Billion US Dollar) where wage rate is significantly high.

In 2013, three largest FDI recipient countries wage rate and inflow of FDI is given below:

- First: USA received 188 Billion US Dollar where as Wage rate is \$ 6.24 per-hour
- Second: China received 124 Billion US Dollar where as Wage- \$ 1.96 per-hour
- Third: Russian Federation received 79 Billion US Dollar where as Wage- \$ 4.99 per-hour

In 2013, the top twenty FDI recipient countries (10 are developed and 10 are developing country) received \$ 1019 Billion (73.64%) FDI but average wage Rate of these 20 countries is 6.89 US dollar per-hour. On the other hand Transition and LDCs Receipts only \$ 98 billion (7 %) FDI, whereas the average wage rate of these 48 LDC's is only \$ 0.51 per-hour (WIR, 2014).

**Table 1: World Inflow and Outflow of FDI**

Total Inflow-\$1452 billion	Total Outflow- \$ 1411billion
Developed Economies - \$566 billion (39%)	Development Economies - \$ 857billion (61%)
Developing Economies- \$788 billions (54%)	Developing Economies- \$ 454 billion (32%)
Developed and Developing Economies- Total \$1344 Billion (93%)	Developed and Developing Economies-Total \$1311 Billion (93%)

Source: WIR, 2014

The top twenty FDI recipient countries (10 are developed and 10 are developing country) received 1019 Billion (73.64%) FDI (WIR, 2014) and the average wage of these 20 countries are 6.89 US dollar per hour, whereas, 48 LDC's average wage rate is 0.51 US dollar per hour (World Bank World Development Indicators Database Update, Last Update, April, 14). The LDC's, LLDC and SIDA (Small Island Developing States) received only 98 billion US Dollar FDI (0.7% of global FDI) and out-flow from these countries are 100 US Dollar (WIR, 2014).

This presents a clear picture that the low wage (actually due to low productivity and social unrest) is not the competitive disadvantage for attracting FDI.

## 7. Result and Discussion

In broad category, the cause of direct relationship between wage rate and Inflow of net-FDI can be divided in two ways, one is economic factor and another is social factor. The economic factor of the positive relationship between wage rate and net inflow of FDI is the productivity gap between developed/developing country and LDC's. Productivity depends on mainly skilled human-capital and then infrastructure and so on. In a competitive market wage is determined by it's productivity. The social factor is that, when the wage rate of a country is significantly low then there may have frequent labor unrest, huge unemployment and as a result it may create political instability. This political instability create the uncertainty of political regime as well as uncertainty of economic policy and for that reason the investors return of the capital become uncertain and then they fell hesitate to invest there.

Productivity of labor mainly depends on the working knowledge. World Bank prepared a Knowledge Economy Index (KEI) – an aggregate index representing a countries or regions overall preparedness to compete in the knowledge Economy (KE). The KEI is based on a simple average of four sub- indexes and these are Economic Incentive and Institutional Regime (EIR), Innovation and Technological Adoption, Education and Training, Information and Communications Technologies (ICT) Infrastructure, which represent the four pillars of the knowledge economy:

Table 1: Index of KEI<sup>1</sup> and KI<sup>2</sup> of the Group of the Nation- 2012

Groups	Knowledge Economy Index(KEI)	Knowledge Index(KI)	Economic Incentive Regime(EIR)	Innovation	Education	ICT
High Income	8.60	8.67	8.39	9.16	8.46	8.37
Upper Middle Income	5.10	5.07	5.18	6.21	4.72	4.28
Lower Middle Income	3.42	3.45	3.32	4.90	2.84	2.62
Low Income	1.58	1.58	1.61	2.13	1.54	1.05

Source:[http://info.worldbank.org/etools/kam2/KAM\\_page5.asp#c21](http://info.worldbank.org/etools/kam2/KAM_page5.asp#c21)(World Bank, Knowledge for Development)

<sup>1</sup>The Knowledge Economy Index (KEI)—an aggregate index representing a country’s or region’s overall preparedness to compete in the Knowledge Economy (KE). The KEI is based on a simple average of four sub-indexes, which represent the four pillars of the knowledge economy:

- Economic Incentive and Institutional Regime (EIR)
- Innovation and Technological Adoption
- Education and Training
- Information and Communications Technologies (ICT) Infrastructure

<sup>2</sup>Knowledge Economy Index (KAM) consists of 148 structural and qualitative variables for 146 countries to measure their performance on the 4 Knowledge Economy (KE) pillars: Economic Incentive and Institutional Regime, Education, Innovation, and Information and Communications Technologies. Variables are normalize on a scale of 0 to 10 relative to other countries in the comparison group.

Table7 gives us the real gap of knowledge among the groups of different income country. The KEI and KI are respectively 5.44 and 5.31 times higher in high income country group (Developed country) than the low income country group (LDC’s). It indicates that for attaining the same output in a same industry for the same product, more than 5 times worker is required if the worker is employed from the low income countries. If the workers are paid according to their productivity then there is no problem in the cost consideration. But if the investor employs the worker from the low income countries, he has to face the additional problem of human management hazards as the investor has to employ more than five times worker for the same output. If we consider this hazard as a cost (though this types of cost is invisible and not measurable), then it enhances the real cost of production and reduce productivity in the low-income countries.

In 1990, US Economist Robert Lucas argued that according to economic law, the capital would flow from developed to under developed country. But in reality this is not happening. We get a rational explanation of Lucas statement in the quarterly publication of IMF, 2007. The report identified that the productivity of capital drastically decreased in the under developed country due to infrastructural problem, unskilled manpower and corruption. The report further stated that in such a situation, if the capital flows, it will be occurred in the rapid developing country but this is also not happening. For explaining the reason, IMF did a study among the 59 country by using time series data from 1970 to 2004. The study did not find any strong relationship between foreign capital flow and economic growth. IMF Economist up to 2007 and then the Governor of the Indian Reserve Bank, Raghuram Rajaon

mentioned in his famous book 'Front Lines' that a country's economic growth will be more speedy if the country invest from his own resource. (Raruk Moinuddin, Doinik Prothom-Alo, 13, October, 2014, translated form).

The Global Competitiveness Index 2014–2015 mention:

We define competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. The level of productivity, in turn, sets the level of prosperity that can be reached by an economy. The productivity level also determines the rates of return obtained by investments in an economy, which in turn are the fundamental drivers of its growth rates. In other words, a more competitive economy is one that is likely to grow faster over time. The concept of competitiveness thus involves static and dynamic components. Although the productivity of a country determines its ability to sustain a high level of income, it is also one of the central determinants of its return on investment, which is one of the key factors explaining an economy's growth potential. Many determinants drive productivity and competitiveness. Understanding the factors behind this process has occupied the minds of economists for hundreds of years, engendering theories ranging from Adam Smith's focus on specialization and the division of labor to neoclassical economists' emphasis on investment in physical capital and infrastructure, and, more recently, to interest in other mechanisms such as education and training, technological progress, macroeconomic stability, good governance, firm sophistication, and market efficiency, among others. While all of these factors are likely to be important for competitiveness and growth, they are not mutually exclusive—two or more of them can be significant at the same time, and in fact that is what has been shown in the economic literature.

Low wage rate is the sign of low productivity not the comparative advantage for the inflow of FDI, rather high wage, if it is justified by the productivity (which is specially depends on skilled human capital and infrastructure), is competitive advantage for attracting FDI (GCI Report 2007-2008).

### Econometric Approach:

Now I will try to establish the relationship between wage and Inflow of FDI by using Econometric Modeling. It is well known to us that wage (WRPH) is the important determining factor of inflow of FDI. Another determining factors may be, market openness, political instability and Quality of Human Capital. We will defined here, market openness as the export-GDP ratio (EXGDPR) though there are many other indicator of market openness. Military expenditure may be the proxy variable of political instability and knowledge Economy Index (KI) is the proxy variable of skilled human capital as well as human productivity. FDI-population ratio (FDIPR) is used as Dependent variable. So we can write down the Model as follows:

$$FDIPOP = \alpha + \beta_1 WRPH + \beta_2 EXGDPR + \beta_3 KI + \beta_4 MILE + \epsilon \dots \dots \dots (1)$$

Here,  $\epsilon$  is the disturbance term and  $\alpha$  is the constant term and all the variables are defined above.

Model 1: OLS Model

$$FDIPOP = \alpha + \beta_1 WRPH + \beta_2 EXGDPR + \beta_3 KI + \beta_4 MILE + \epsilon \dots \dots \dots (1)$$

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	11.39659	Prob. F(4,70)	0.0000
Obs*R-squared	29.57941	Prob. Chi-Square(4)	0.0000
Scaled explained SS	411.2912	Prob. Chi-Square(4)	0.0000

The nul null hypothesis for the Heteroskedasticity Test is:

Ho: Homoskedasticity

When traditional OLS is run then it is assumed that all the properties are satisfied. Here cross-section data, that is, data of 2013 year is used for the estimation of the variables. Most of the cases cross-section data have the problem of heteroskedasticity. Breusch-Pagan-Godfrey test is widely used for testing heteroskedasticity. First OLS is run and then by using Eviews-8 software we can easily test of the problem of heteroskedasticity.

As the observed R-squared is 29.579 and the corresponding P-value is .0000 which is less than 0.5 then we can-not accept the null-hypothesis, that is, problem of heteroskedasticity exists.

To remove the problem of Heteroskedasticity we can take log in the both sides of the Eq(1). After taking log in both sides of the Eq(1) and then run the OLS, and then we can again examine the Breusch-Pagan-Godfrey test. As the observed R-squared is 2.86 and the corresponding P-value is 0.58 which is larger than 0.05 then we can accept the null-hypothesis, that is, problem of heteroskedasticity does not exist. On the other hand, Jarque-Bera- test is 1,93 and the corresponding P-value is 0.379, that is residual are normally distributed (see Appendix A). The adjusted R-squared is 0.706903 which is highly satisfactory for a good model.

The Estimated model and results are as follows.

$$\log(\text{FDIPOP}) = + 1 \log(\text{WRPH}) + 2 \log(\text{EXPGDPR}) + 3 \log(\text{KI}) + 4 \log(\text{MILE}) + \epsilon \dots \dots \dots (2)$$

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.693863	Prob. F(4,64)	0.5989
Obs*R-squared	2.867913	Prob. Chi-Square(4)	0.5802
Scaled explained SS	1.659986	Prob. Chi-Square(4)	0.7980

Dependent Variable: LOG(FDIPOP)

Method: Least Squares

Date: 11/24/14 Time: 14:54

Sample (adjusted): 2 212

Included observations: 69 after adjustments ( Number of Country)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.770055	0.955177	0.806191	0.4231
LOG(WRPH)	0.936177	0.217002	4.314133	0.0001
LOG(EXPGDPR)	1.010390	0.221504	4.561493	0.0000
LOG(KI)	0.099820	0.415720	0.240114	0.8110
LOG(MILE)	-0.277194	0.168248	-1.647529	0.1044

R-squared	0.724144	Mean dependent var	5.262515
Adjusted R-squared	0.706903	S.D. dependent var	1.631204
S.E. of regression	0.883109	Akaike info criterion	2.658967
Sum squared resid	49.91238	Schwarz criterion	2.820859
Log likelihood	-86.73437	Hannan-Quinn criter.	2.723195

F-statistic	42.00121	Durbin-Watson stat	2.677865
Prob(F-statistic)	0.000000		

---

---

Here, the co-efficient of log (WRPH) is 0.93 and the corresponding p-value is .0001 which is less than 0.05 indicates that the value of the co-efficient is statistically significant. It also re-confirms the positive relationship between wage rate and inflow of FDI. In this model co-efficient of other variable, that is, the coefficient of export-GDP ratio (proxy variable of market openness), Knowledge Index ratio (proxy variable of human productivity), military expenditure which is the proxy variable of political stability has the expected sign. The co-efficient of export-GDP ratio is statically significant. As among the four right-hand side variable two of them are statistically significantly, so we can say that the model is good.

## 7. Conclusion

Labor and capital are the main two factors of production. If open market exists in the world then labour will move where rental rate of capital is comparatively low due to capital abundance. On the other hand, capital will move where wage rate is comparatively low due to labour abundance. It says that, low wage rate is the competitive advantage for inflow of FDI. Though world trade is increasing day-by-day, that is, market openness is increasing but developed countries are not encouraging for the inflow of labour. But developed countries are ready to invest in the outside of their boundary where return of capital is high. In practical, inflow of FDI is low where wage rate is significantly low because low wage rate is the sign of low productivity. On the other hand, when the wage rate of a country is significantly low then there may have frequent labor unrest, huge unemployment and as a result it may create social and political instability. This political instability create the uncertainty of political regime as well as uncertainty of economic policy and for that reason the investors return of the capital become uncertain and then they fell hesitate to invest there and finally we can see that the wage rate and inflow of FDI is directly related.



## References:

Arbache J. S.,(2004), The Impacts of Foreign Direct Investments on the Labor Market in Brazil, Departamento de Economia, Universidade de Brasília, Caixa [https://www.google.com.bd/?gws\\_rd=cr,ssl&ei=rF5WVNL\\_DNWQuASC2oKADg#](https://www.google.com.bd/?gws_rd=cr,ssl&ei=rF5WVNL_DNWQuASC2oKADg#)

Asiedu E. (2002) “On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?” *World Development*, Vol.30, pp. 107-120.

Moinuddin F, Doinik Prothom-Alo, 13, October, 2014, translated form

Noorbakhsh, F., A. Paloni and A. Youssef (2001) “ Human capital and FDI inflows to Developing Countries: New Empirical Evidence” *World Development*, Vol.29, pp.1593-1610.

Onwuka, Kevin Odulukwe (2011), Wage rate, regional trade bloc and Location of Foreign Direct Investment Decisions, *Asian Economic and Financial Review*, 1(3),pp.134-146

Parcon, H., Labor Market Flexibility as a Determinant of FDI Inflows, Working Paper No. 08-07, October 2008, [www.economics.hawaii.edu](http://www.economics.hawaii.edu)

Robert F. C., Gordon H. H. (1995), Foreign Direct Investment and Relative Wages, Evidence from Mexico's Maquiladoras, Working Paper No. 512, National Bureau of Economic Research

The Global Competitiveness Report 2007-2008

The Global Competitiveness Index 2014–2015

World Bank (2006) *World Development Indicators (CD-ROM)*, Washington, DC: World Bank.

World Bank, 2013, Retrieved from, [http://www.enterprisesurveys.org/~media/GIAWB/Enterprise Surveys/Documents/Country Highlights/Bang](http://www.enterprisesurveys.org/~media/GIAWB/Enterprise%20Surveys/Documents/Country%20Highlights/Bang)

<http://www.thefinancialexpress-bd.com/old/index.php?ref=MjBfMDhfMjdfMTNfMV8yXzE4MTIz>

<http://www.unicef.org> (for Adult Literacy India Pakistan Srilanka)

<http://www.iccwbo.org/>

<http://www.nationmaster.com/country-info/stats/Economy/Technology-index> Ranking

<http://data.worldbank.org/indicator/IQ.WEF.PORT.XQ>

<http://info.worldbank.org/governance/wgi/index>

<http://www.transparency.org>

[http://www.enterprisesurveys.org/~media/GIAWB/Enterprise Surveys/Documents/Country Highlights/Bang](http://www.enterprisesurveys.org/~media/GIAWB/EnterpriseSurveys/Documents/CountryHighlights/Bang)

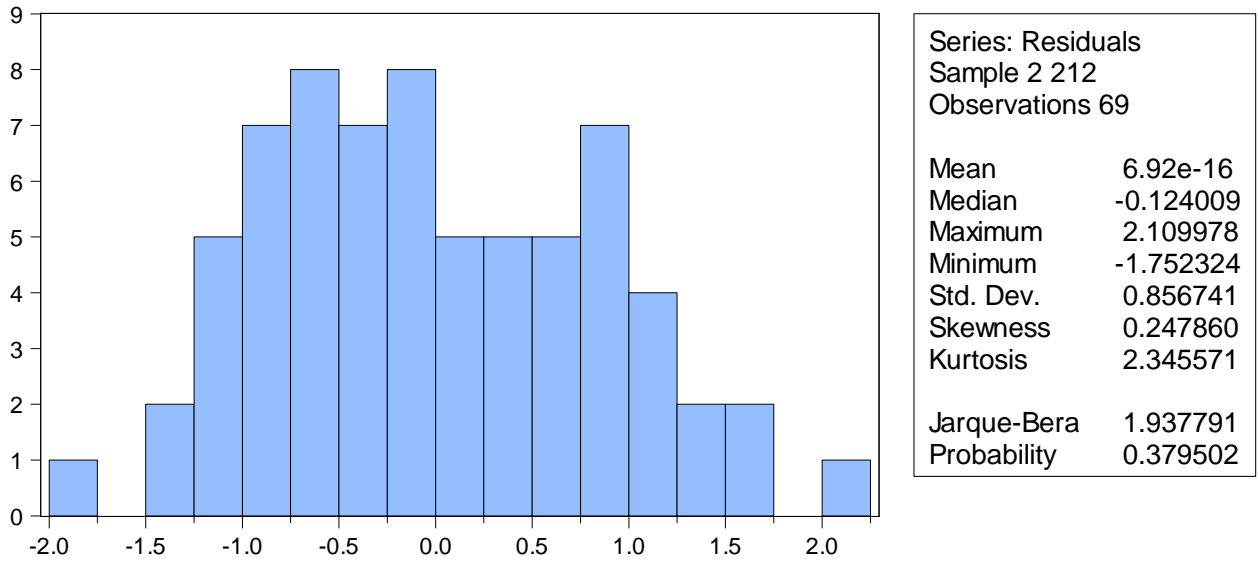
<http://www.heritage.org/index/>

<http://www.nationmaster.com/country-info/stats/Economy/Technology-index> Ranking

[http://info.worldbank.org/etools/kam2/KAM\\_page5.asp#c21](http://info.worldbank.org/etools/kam2/KAM_page5.asp#c21)

## Appendix A: Normal Distribution of Residual

Model:  $\log(\text{FDIPOP}) = + 1 \log(\text{WRPH}) + 2 \log(\text{EXPGDPR}) + 3 \log(\text{KI}) + 4 \log(\text{MILE}) + \epsilon$



## Appendix B: Residual Plot

