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# Table of Contents

DIFFERENT PRICE INDICES AND THE IMPLICATION  
FOR THE FEDERAL RESERVE REACTION  
FUNCTION: AN EMPIRICAL STUDY ..... 1  
Christopher N. Annala, State University of New York at Geneseo  
Anthony Yanxiang Gu, State University of New York at Geneseo  
Shuo Chen, State University of New York at Geneseo

FORMULA DERIVATIONS FOR CLASSROOM USE:  
AN INTRODUCTION ..... 6  
Alan Blaylock, Murray State University

HAS THE US ECONOMY EXHIBITED LESS  
UNCERTAINTY DURING THE GREENSPAN ERA? ..... 7  
Christopher Annala, State University of New York  
Shuo Chen, State University of New York  
Anthony Yanxiang Gu, State University of New York

STUDENT AND BUSINESS ATTITUDES TOWARD THE  
ECONOMIC POLICIES OF THE OBAMA  
ADMINISTRATION ..... 12  
Larry R. Dale, Arkansas State University

PERSISTENT POVERTY IN THE U.S. .... 16  
Inhyuck "Steve" Ha, Western Carolina University

ADDRESSING THE RISING COST OF COLLEGE ..... 17  
Jessica Jones, Sam Houston State University  
Tommy C. Adams, Jr., Sam Houston State University  
John Reinke, Sam Houston State University

AN ASSESSMENT OF TOP ECONOMISTS BASED  
ON HIRSCH INDEX ..... 21  
Gurumurthy Kalyanaram, GK Associates  
Satyanarayana Parayitam, University of Massachusetts Dartmouth  
Vivek S. Natarajan, Lamar University

THE EFFECTS OF FOREIGN DIRECT INVESTMENT  
ON ECONOMIC GROWTH OF A DEVELOPING  
COUNTRY: FROM KAZAKHSTAN ..... 22  
Jung Wan Lee, Boston University  
Gulzada S. Baimukhamedova, Kazakh Academy of Transport and Communications  
Sharzada Akhmetova, Kazakhstan Institute of Management, Economics and Strategic  
Research (KIMEP)

THE EFFECTS OF THE MICHIGAN MINIMUM WAGE  
INCREASE ON LOW SKILLED LABOR MARKETS ..... 28  
Samantha Noah, Saginaw Valley State University

DOES TECHNOLOGY MATTER: AN ANALYSIS OF  
COMPUTER AND INTERNET USAGE ON ECONOMIC  
GROWTH ..... 29  
Christopher J. Surfield, Saginaw Valley State University

MACROECONOMICS ASSESSMENT RESULTS:  
STUDENT PERFORMANCE ACROSS MULTIPLE  
LEARNING OBJECTIVES ..... 30  
Neil Terry, West Texas A&M University  
Steve Hayward, West Texas A&M University  
Parman Reynolds, West Texas A&M University

MICROECONOMICS ASSESSMENT RESULTS:  
STUDENT PERFORMANCE ACROSS MULTIPLE  
LEARNING OBJECTIVES ..... 31  
Neil Terry, West Texas A&M University  
Steve Hayward, West Texas A&M University  
Parman Reynolds, West Texas A&M University

CAN CULTURE EXPLAIN ECONOMIC GROWTH?  
A NOTE ON ISSUES REGARDING CULTURE-GROWTH  
STUDIES ..... 32  
Arnel Onesimo O. Uy, De La Salle University

# **DIFFERENT PRICE INDICES AND THE IMPLICATION FOR THE FEDERAL RESERVE REACTION FUNCTION: AN EMPIRICAL STUDY**

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## **ABSTRACT**

*This paper demonstrates the importance of properly measuring inflation when estimating Federal Reserve reaction functions. Based on static Taylor rule type reaction functions the median consumer price index (MCPI) is a better measure of information on monetary inflation than either the consumer price index (CPI) or the GDP chain-type price index (CTPI) or several other common measures of inflation. The issue is important when attempting to assess the stance of monetary policy; the Federal Reserve's goal of maintaining price stability must account for movements in the overall price-level and not changes in relative price.*

*\*The author's would like to thank researchers at the Cleveland Federal Reserve Bank for providing the quarterly data on the median consumer price index.*

## **INTRODUCTION**

This paper examines the implications of using different price indices in the estimation of Federal Reserve reaction functions. The use of different indices generates different reactions by the Federal Reserve to inflation based on the time period being analyzed. Taking the two main goals of the Federal Reserve as given, which are to promote economic growth and maintain price stability, it is critical when attempting to determine the stance of monetary policy to understand the implications from the use of different measures of inflation. Mismeasuring price level changes may lead to faulty conclusions about the stance of monetary policy, in particular the Federal Reserve's stance on inflation. The price indices examined in this paper include the Consumer Price Index (CPI), the consumer price index less food and energy (CPILF), the Gross Domestic Product chain-type price index (CTPI), the GDP deflator (DEF), the personal consumption expenditures index (PCE), the personal consumption expenditures index less food and energy (PCELF), and the Median Consumer Price Index (MCPI).

The first six indices are familiar to economists; the seventh may be somewhat less familiar. The MCPI is a measure of inflation calculated by the Cleveland Federal Reserve Bank. Bryan and Pike (1991) provide a brief explanation of the calculation of the MCPI and rationale for using the MCPI to estimate the rate of inflation.

The median of a set of data is the value of the middle observation when all items are arranged in either ascending or descending order of magnitude. In effect the median consumer price

change is the CPI less everything but the price change that lies in the middle of the continuum. Since only the order, not the values, of the various price changes is used in its calculation, the median is a central tendency statistic that is largely independent of the data's distribution. The median also has the intuitively appealing property of lying closer to the majority of price changes than does any alternative measure. (Bryan and Pike, 1991)

A more rigorous discussion of the median price index as a measure of monetary inflation, or a "trimmed means estimator of inflation" can be found in Bryan, Cecchetti, and Wiggins (1997). The authors find that the trimmed means estimators yield an efficient estimator of core inflation which is twenty-three percent more efficient than the standard mean CPI.

The Consumer Price Index (CPI) as the measure of inflation in the U.S. economy is probably one of the most often cited pieces of economic information. Everything from Social Security benefits to union contracts depend upon the consumer price index, through the use of cost of living adjustments. The case has been made that the CPI overstates the rate of inflation therefore it may not be the most appropriate measure of monetary inflation or the price level in the economy. However, based on the underlying implications for the CPI, it remains an important measure of macroeconomic performance.

The GDP deflator index is often used as an alternative to the CPI when estimating the rate of inflation. The inflation rate as measured by the GDP chain-type price index tends to be lower than that measured by the CPI. In fact, the inflation rate as measured by the CPI exceeds that from the GDP chain-type price index in 95 of the 133 quarters (or over seventy-percent of the time) from 1968 Q4 through 2001 Q4. The GDP chain-type price index is the broadest measure of the price level, in that, it includes goods and services not captured by the CPI, including investment goods. Both the CPI and the GDP chain-type price index appear as measures of inflation in the reaction function literature with varying degrees of significance, for example Judd and Rudebusch (1998). 1 shows a plot of the CPI and GDP chain-type price indices from 1968 Q4 through 2001 Q4 using quarterly data.

The use of the CPI as the measure of inflation is troublesome because in addition to measuring changes in the overall price level (inflation) the CPI also tends to measure changes in relative price movements. The issue addressed in this paper is whether or not there exists a measure of inflation that is "better" than either the CPI or CTPI, or other popular measures of inflation including the PCE, for determining the stance of monetary policy. The answer according to Bryan and Pike (1991) is yes. As demonstrated by Bryan and Pike, the MCPI is more closely related to changes in the money supply than the CPI, which indicates that it is a better measure of monetary inflation and is less affected by relative price changes.

Distinguishing between inflation and relative price movements is also important for the conduct of monetary policy. Without a clear distinction between the two, policymakers may inadvertently react to relative price changes and thereby complicate the economy's adjustment to a new set of prices. By not reacting to changes in the inflation rate, they might allow unnecessary price level fluctuations. (Bryan and Pike, 1991)

Figure 2 plots inflation measured from the CPI and the MCPI from 1968.4 through 2001.4. From the Figure we see that the MCPI is less volatile than the CPI particularly from the mid-1980s through 2001. Table 1 provides descriptive statistics for inflation based on the seven price indices being examined. The table indicates that for the entire sample inflation as measured by the CTPI

or the PCELF are on average lower than either the CPI or MCPI and they both also have smaller standard deviations. Table 1 also shows that during both periods the CPI and CTPI have minimums which indicate deflation, whereas the minimum inflation rate based on the MCPI is approximately 2.3 percent.

According to Brunner (1994) and Hetzel (2000) this latter period represents a regime shift at the Federal Reserve where inflation began to receive greater attention and the role of monetary growth was de-emphasized. This also represents a period where the federal funds rate became the primary tool of monetary policy. Table 2 provides the correlation matrix between the different price indices and the federal funds rate. The results indicate that over the whole sample the CPILF has the highest correlation with the federal funds rate and the CTPI has the lowest correlation with the federal funds rate. During the more recent time period the MCPI has the highest correlation with the federal funds rate followed by the GDP deflator and the GDP chain-type price index, the latter two represent much broader measures of inflation than does the CPI. Interestingly, during this more recent time-period the CPI has the lowest correlation with the federal funds rate, (0.472), of the seven price indices.

## DATA AND METHODOLOGY

All data are quarterly and cover 1968.4 through 2001.4. The starting point for the data represents the beginning of the median consumer price index series available from the Cleveland Federal Reserve Bank. The data covering real gross domestic product, the consumer price index, the gross domestic product chain-type price index, and the federal funds rate are from the St. Louis Federal Reserve Bank. Data for the median consumer price index are from the Cleveland Federal Reserve Bank, where the series is maintained. Following convention annualized growth rates for inflation and GDP are calculated according to:

$$\begin{aligned}\pi_{i,t} &= 400*(\ln(P_t) - \ln(P_{t-1})) \\ &\text{and} \\ y_t &= 400*(\ln(\text{GDP}_t - \ln(\text{GDP}_{t-1}))\end{aligned}$$

The quarterly data on the MCPI were provided by researchers at the Cleveland Federal Reserve Bank.

The reaction function to be estimated is given by the following:

$$\text{FFR}_t = c + \eta \text{FFR}_{t-1} + \alpha y_t + \beta \pi_{i,t}$$

Where  $\text{FFR}_t$  is the current federal funds rate,  $\text{FFR}_{t-1}$  is the federal funds rate from the previous quarter,  $y_t$  is the growth rate of real GDP,  $\pi_{i,t}$  is the inflation rate based on the three different indices, and  $c$  is a constant. The rationale for including the lagged federal funds rate is to capture potential interest rate smoothing by the Fed. The coefficients to be estimated are  $c$ ,  $\eta$ ,  $\alpha$ , and  $\beta$ . This reaction function differs from the standard ‘‘Taylor rule’’ reaction function, estimated by Taylor (1993) in that rather than using output gaps and inflation gaps, the estimation is based on the growth rates of real GDP and inflation. This alternative estimation has the advantage of not having to determine the Federal Reserve’s inflation target or possible issues with determining

potential GDP and has been used in several empirical papers including McNees (1986) and Perez (2000). Federal Reserve reaction functions similar to the one above have been estimated in a variety of settings, for example Bernanke and Blinder (1992), Brunner (1994), Balke and Emery (1994), Christiano, Eichenbaum, and Evans (1996), and Rudebusch (1998).

## RESULTS

The reaction function above is estimated over two time periods, 1968.4, after accounting for the lagged federal funds rate, through 2001.4 and also the more recent time period 1982.1 through 2001.4, which represents a relatively stable period of monetary policy. Table 3 provides the results of the estimation from 1968.4 through 2001.4. Over the whole sample there are only minor differences between the estimations. Based on the results, the federal funds rate reacts least strongly to inflation measured from by the MCPI than from the other two measures of inflation. However, both inflation and real GDP growth have significant and positive effects on the FFR in all seven equations. In addition, the adjusted R-squared for the CPI equation and the standard error of regression from the CPI equation indicate that the CPI provides a slightly better fit than inflation measured by the other indices. There are very small differences in the response to the growth rate of GDP among the seven estimations. Therefore, the conclusion for the entire sample is that the choice of the price index is relatively unimportant and that the differences in the Federal Reserve reaction functions based on the indices are negligible. Figure 3 plots the actual federal funds rate over this time period against the fitted federal funds rate from the MCPI regression, the plot appears to show a very good fit based on the MCPI.

To determine whether or not the regression equations estimated are stationary, an augmented Dickey-Fuller test (ADF) is performed on the residuals for each equation. The results of the ADF tests are presented in Table 4. For each of the equations the null hypothesis of a unit root in the residuals is rejected at the 1- percent significance level. This implies that the relationships described in Table 3 are not spurious and perhaps there is a long-run cointegrating relationship among the FFR output and prices.

Based on the plot of the inflation rates from Figures 1 and 2, and also the descriptive statistics in Table 1, the period from 1982 through 2001 represents a period of more stable prices than the entire sample. The stability of this period may be attributable to a shift in the monetary policy targets, from monetary aggregates to the federal funds rate. To determine whether or not the Federal Reserve has reacted differently to inflation in the post 1982 regime, as suggested by Brunner (1994), the Federal Reserve reaction functions are re-estimated using the more stable sample period, 1982 Q1 through 2001 Q4. The results of these estimations are presented in Table 5.

The results of the estimation over the more recent time period indicate that the only statistically significant inflation rate at the 1-percent level in the Federal Reserve reaction function is the rate of inflation as measured by the MCPI. The inflation variable is not significant at the ten-percent level in three of the regressions, including the CPILF, PCE, and PCELF. These results are interesting in that the CPILF and the PCELF have been touted as better measures of inflation than the CPI or the CTPI. The regression equation estimated with the MCPI as the measure of inflation has a highest adjusted R-squared value, the smallest standard error of regression, and the minimum AIC, indicating that the MCPI provides a better fit for the data. The MCPI regression is also the

only equation where the intercept is statistically significant, therefore the response of the federal funds rate is smaller for both GDP growth and inflation. Figure 4 plots the actual federal funds rate with the fitted federal funds rate from the MCPI equation and inflation from the MCPI appears to give a very good fit for the data.

Results of augmented Dickey-Fuller tests are presented in Table 6. Based on the ADF tests, the null hypothesis of a unit root can be rejected for all three equations. These results imply that the estimated regression equations are stationary.

### **CONCLUDING REMARKS**

This paper has demonstrated the importance of properly measuring inflation when estimating Federal Reserve reaction functions. The results indicate that the median consumer price index (MCPI) is a better measure of information on monetary inflation during the stable monetary regime from the early 1980s through the early 2000s, than either the consumer price index (CPI) or the GDP chain-type price index (CTPI), or several other measures of inflation including the CPI less food, the personal consumption expenditures index (PCE) and the PCE less food, based on estimated reaction functions. Over a longer period, from the late 1960s through the 2000s there appeared to be little difference in reaction functions based on inflation from the different price indices. The issue is important when attempting to assess the stance of monetary policy, because the Federal Reserve's goal of maintaining price stability must account for the fact that the CPI may be measuring relative price movements rather than overall price-level changes.

This paper suggests that the MCPI perhaps best represents the information being used by the Federal Reserve when setting monetary policy. This is likely due to the fact that the MCPI is less affected by relative price movements than the CPI or the CTPI and is more closely related to monetary inflation, or changes in the overall price-level. Further research should examine the MCPI in dynamic Taylor rules as the results presented in this paper are based on the estimation of static Federal Reserve reaction functions.

# FORMULA DERIVATIONS FOR CLASSROOM USE: AN INTRODUCTION

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## ABSTRACT

*This paper demonstrates how annuity formulas may be derived in the classroom with the purpose of giving students insights into the problem solving process. Many students find the use of mathematics in any discipline somewhat difficult. This is indeed true for finance courses as well, especially for the finance principles course that is usually required of all business majors. Students may approach problem solving using a “black box” approach by simply inputting numbers into a financial calculator or a formula without any thought of how the answer is computed. They may not even question why the answer is what it is. The student may not see the concept behind the computations. Many students distinguish between material that is more “concept” and that which requires the use of formulas. They fail to realize that the two are inseparable; formulas are simply concepts written in mathematical terms. If students were allowed to see the reasoning behind the formulas, they may better be able to understand and use those formulas as well as understand what their financial calculator is doing when inputting the numbers.*

*This paper demonstrates how formulas may be derived so that students may have a better understanding of the problem-solving process. Specifically, the Present Value of a Perpetuity (PVP) formula is used to derive the Present Value of an Annuity (PVA) and Future Value of an Annuity (FVA) formulas. In addition, the Present Value of a Growing Perpetuity (PVGP), also known as the Constant-Growth Model, is used to derive the Present Value of a Growing Annuity (PVGA) and Future Value of a Growing Annuity (FVGA) formulas. Textbooks are also reviewed for coverage of such derivations.*

# **HAS THE US ECONOMY EXHIBITED LESS UNCERTAINTY DURING THE GREENSPAN ERA?**

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## **ABSTRACT**

*The U.S. economy during Greenspan's tenure as the Federal Reserve Chairman exhibited the lowest unemployment rate, the most stability in terms of real GDP growth, employment, inflation, and interest rates when compared to Canada and United Kingdom. This indicates that the Fed did manage to minimize uncertainty and maximize employment during the period. However, while the U.S. economy is able to generate more job opportunities with each percentage point of GDP growth, U.S. consumers face the fastest price increase for each percentage point of GDP growth, and the second highest price increase for each percentage point of employment rate, and U.S. firms pay the highest financing costs per unit of growth among the three countries.*

## **INTRODUCTION**

It is well recognized that Allan Greenspan was among the best Chairman in the history of central banks, guiding the U.S. economy through a prolonged period of economic growth and stability, throughout the 1980s and 1990s. However, it is difficult to measure a Federal Reserve Chairman's or a central bank's performance, and to compare central banks' performance, in part because economies exhibit different growth rates, inflation and interest rates at different stages of development, and each economy has its own particular natural, cultural, and political conditions and environments, and the differences may sometimes dominate the role of a central bank.

In this study, we compare the macroeconomic performance in three different countries. Our purpose of this study is to use simple, straightforward calculations to show whether the American people enjoyed better economic conditions in the Greenspan era than did people in Canada and in the United Kingdom, since the Fed's and the other two central banks' policies may have played an important role in the performance of the economy. We do not attempt to trace the causes of the macroeconomic performances in this study since there is already a broad agreement on the importance of monetary policy. We examine and compare relative measures, such as the ratios of inflation to unemployment, inflation to GDP growth, employment and interest rate to GDP growth. We select Canada and the United Kingdom for comparison because these two countries are the most similar to the United States in terms of culture, political system, and stage of economic development.

Is the difference in performances of the three countries caused by their different policy goals? Canada and United Kingdom adopted inflation targets in 1991 and 1992, respectively, while the United States does not have formal inflation targets. Dueker and Fischer (2006) find little

evidence that inflation-targeting monetary policies outperform given the same circumstances. This is the case when they compare the inflation performances of Canada and the United States. The extensive survey of empirical studies by Dueker and Fischer (2006) provide similar conclusions. Cecchetti and Ehrmann (2002) analyze 23 countries in the pre EMU period and find that inflation targets did not cause difference in the patterns of inflation and output volatilities. A common explanation for this is that the successful non-inflation targeters' practices converge to those of inflation targeters (Bernanke et al., 1999; Mishkin, 2002). The fact that both the Bank of England and the Bank of Canada adopted policies of inflation targeting does not take away from the fact that the goals of all three central banks are similar. Although the exact policies and regulations governing the three central banks may differ to some degree, all three banks are primarily concerned with price stability and non-inflationary economic growth.

However, to address the differences that exist between the economies of Canada, the United Kingdom and the United States we cannot simply measure Greenspan's or the Fed's performance by examining whether the U.S. GDP growth rate was the highest and unemployment rate and inflation rate was the lowest during his era. Hence, we also examine and compare relative measures, such as the ratios of inflation to unemployment, inflation to GDP growth, employment and interest rate to GDP growth.

We focus on comparing the volatilities of the economic indicators or uncertainties of the economies. If a Fed Chairman/central bank is able to "act against the wind" promptly and adequately he/it should be able to reduce the volatility of the economy. The Federal Reserve System is also concerned about minimizing interest rate variations. These are important for all participants of the economy except a few extreme speculators.

We select the period when Alan Greenspan served as the Fed Chairman 1987-2005 for comparison. We do not compare the U.S. economy's performance of 1987-2005 with that of previous time periods because the domestic and international economic and political environments and development stages are different over time, for example, the US enjoyed high economic growth, low unemployment and low inflation in the 1950s, stagflation in the 1970s; Japan had high growth and inflation in the 1970s and 1980s, followed by Singapore, South Korea, Taiwan and Thailand, which experienced high economic growth in the 1990s. Recently, while developed economies are showing moderate economic growth, China and India have managed to maintain high rates of economic growth.

Data on real gross domestic product growth (GDP), the consumer price index (CPI), and the yield on the ten-year Treasury bond are from *International Financial Statistics* (IFS) of the International Monetary Fund (IMF), the websites of the National Bureau of Economic Research (NBER), the Federal Reserve System, the Bank of Canada and the Bank of England. Data of the unemployment rate for the United States are available from the Bureau of Labor Statistics, data on the unemployment rate for the United Kingdom are available from National Statistics Online, and data on the unemployment rate for Canada are available from Statistics Canada. (Data sources: Bureau of Labor Statistics: <http://stats.bls.gov/>, National Statistics: <http://www.statistics.gov.uk/>, Statistics Canada: <http://www.statcan.ca/start.html> ).

## PERFORMANCE OF THE THREE ECONOMIES

Over the period 1987 – 2005, each of the three countries has experienced at least one recession according to the analyses from National Bureau of Economic Research (NBER) and the Economic Cycle Research Institute (ECRI). (The NBER chronology of business cycles is available via the World Wide Web at <http://www.nber.org/cycles.html> and the ECRI chronology are available at <http://www.businesscycle.com/>). NBER determines the timings of the business cycle for the United States and ECRI employs the same methodology for twenty other countries to determine recessions and expansions. The first recession in the United States during Greenspan's tenure at the Fed occurred from July 1990 through March 1991, lasting 8 months. The second recession ran from March 2001 through November 2001, and lasted 8 months. Canada experienced a much longer recession in the early 1990s that began in March 1990, ended in March 1992, and lasted 24 months. The United Kingdom experienced a recession that nearly coincides with Canada, beginning two months later in May 1990, ending in March 1992, and lasting 21 months. Although neither Canada nor the United Kingdom experienced a recession in 2001 as the United States did, it is worth noting that the combined duration of the two United States recessions is still shorter than the duration of the 1990 recessions in both Canada and the United Kingdom, and the total decline of the U.S. GDP during the two recessions is also the lowest. The severity or decline of the Canadian and British GDPs during their recessions is 3.4 percent and 2.5 percent, respectively, and the total decline of the U.S. GDP during the two recessions is 1.7 percent. The statistics are reported in Table 1.

A comparison of key macroeconomic measures among Canada, the United Kingdom, and the United States between 1987 and 2005 reveals that the United States has been the most stable of the three economies based on all three of the most widely cited measures of economic performance: output growth, inflation, and unemployment. As shown in Table 2, in terms of output growth, for the period 1987-2005, the standard deviation in the United States was 1.32 versus 2.63 for Canada and 1.76 for the United Kingdom. However the average annual growth in output for the United States over this time period was slightly lower, 2.40 percent, as compared to 2.52 percent for Canada and 2.57 percent for the United Kingdom. At the same time the United States experienced the most stability in price level. Based on the consumer price index, the U.S. inflation exhibits a standard deviation of 0.98 as opposed to 1.42 for Canada and 2.02 for the United Kingdom. Although the United States had the lowest standard deviation of inflation between 1987 and 2005, it did not have the lowest average rate of inflation over that period, with an average rate of 3.07 percent, versus 2.59 percent in Canada and 3.57 percent in the United Kingdom.

This in some sense reflects what Alesina and Summers (1993) have found, i.e., inflation-averse central bank policy may be associated with less or more variability in economic performance. In order to examine whether the Federal Reserve System and the U.S. economy made progress during the chairman's tenure, we divide the period into three sub-periods. The statistics indicate that overall, each of the three countries experienced sharp declines in inflation from the earliest period, 1987-92, when all countries had an annual inflation rate in excess of 4.12 percent through the last period, 1999-2005, when all three countries had an annual inflation rate under 2.59 percent. The decline in inflation rate may be due more to the international economic environment, but the central banks did cooperate better and improve their monetary policies.

Another key indicator of macroeconomic health is the unemployment rate. Although the calculations of unemployment may vary between countries, a comparison based on data available from each country is still feasible, noting that there may be structural differences in the three economies with regards to unemployment insurance and assistance. As with both inflation and output growth, the United States experienced the most stability in terms of unemployment, with a standard deviation for the 1987 – 2005 period of 0.91 compared to 1.46 in Canada and 2.06 in the United Kingdom. Furthermore, for the entire period the United States had the lowest average rate of unemployment, at 5.59 percent versus 8.65 percent in Canada and 7.46 percent in the United Kingdom. It is also of note that unemployment in the United Kingdom dropped the most significantly from the first sub-period to the last, nearly approaching the rate of the United States in the 1999 – 2005 period (5.19 percent in the U.K. versus 5.04 percent in the U.S.), indicating that there may have been a decline in some of the structural differences.

The 10-year Treasury bond rate is a key measure of long-term interest rates in the three economies. Over the full period and each of the sub-periods the interest rate in the United States was below those in Canada and the United Kingdom and the most stable, except for the last sub-period of 1999-2005. For the full period the average Treasury bond rate in the United States was 6.35 percent with a standard deviation of 1.56 compared to Canada with an average rate of 7.12 percent and standard deviation of 2.08, and the United Kingdom with an average of 7.32 percent and a standard deviation of 2.34. The fact that the U.S. had the lowest and most stable interest rate may in part be explained by the use of U.S. dollars as a reserve currency and the fact that most of the U.S. dollar reserves are invested in long-term U.S. Treasury bonds under the general assumption that the United States is both politically and economically stable.

In order to examine the cost or efficiency of the Fed's and the economy's performance, we compare four relative measures of the three economies, they are the ratios of inflation rate to real GDP growth, inflation rate to employment rate, unemployment rate to real GDP growth, and Treasury bond yield to real GDP growth.

The ratio of inflation to growth measures the price increase that consumers face for each percentage point of real GDP growth, it is high during a stagflation period (e.g., mid 1970s), and low during high growth and low inflation (e.g., mid and late 1990s). High inflation encourages rent seeking activities, raises risk premiums and creates distortions, which may hurt the economy. Deflation causes high costs and low or negative profit to producers, which also hurts the economy. Therefore, the lower is the ratio the healthier the economy. Negative GDP growth during the recession periods are excluded for the calculation because a negative ratio is irrelevant, and deflation did not occur during the period we examine.

The U.S. economy exhibits the highest ratio and largest standard deviation for the whole period (2.28 and 3.37) followed by U.K. (1.79 and 1.96) and Canada (1.19 and 1.36), and for each sub-period, because of the lowest U.S. growth and the medial inflation (See Table 2). This indicates that the U.S. consumers faced faster price increase for each percentage point of GDP growth compared to Canada and United Kingdom, and the Fed's consistent emphases on inflation control is right.

The employment rate is calculated as one minus the unemployment rate. The ratio of inflation to employment indicates the price increase that consumers face for each unit of employment. A lower ratio is preferred. For the whole period, the average ratio for the U.S. was

3.25, below that of U.K. (3.87), but above that for Canada (2.83) while the U. S. experienced the most stability in the ratio. However, both the U.S. ratio and its volatility increased from the lowest in the first sub-period to the highest in the last period.

The ratio of unemployment to GDP growth represents an economy's ability to generate employment opportunities as it grows; a lower ratio indicates stronger ability. Negative GDP growth is excluded in the calculation as negative ratios are irrelevant. The average ratio for the whole period 1987-2005 for the U.S. was 3.54, the lowest or the best among the three, which indicates that the U.S. economy is able to generate more job opportunities with each percentage point of GDP growth. The U.S. economy was the best for the first and second 5-year periods, but the difference declined over time. The U.S. was better than Canada, but significantly worse than the U.K. during the last period. The ratio for the U.S. was also the most stable for the first sub period and the whole period.

The ratio of the T-bond rate to GDP growth is a relative measure of investors' financing costs for their expansions that contribute to each percentage point of real GDP growth, in this case a lower ratio is considered better. Again, negative GDP growth is excluded for the calculation for the same reason as mentioned above. The U.S. experienced the highest ratio and the lowest stability for the whole period (4.33 and 5.49), followed by U.K. (3.97 and 4.60), and Canada (3.64 and 3.54), partly because of the lowest rate of GDP growth, which indicates that U.S. firms pay the highest financing costs for unit growth compared to Canadian and British firms.

## **CONCLUSION**

There are no clear and consistent criteria for measuring a central bank's and an economy's performance, and economic performance is not entirely related to, or caused by, central bank policies, since economies are often subject to exogenous shocks. However, the U.S. economy exhibited the most stability in terms of real GDP growth, employment, inflation, and interest rate, and the lowest unemployment rate, hence, compared to Canada and United Kingdom, the American people did enjoy the least uncertainty and most employment during the time period when Alan Greenspan was the Federal Reserve System chairman.

However, the relative measurements reveal that U.S. consumers face the fastest price increase for each percentage point of GDP growth, and the second highest price increase for each percentage point of employment, the U.S. economy is able to generate more job opportunities with each percentage point of real growth, and U.S. firms pay the highest financing costs for each percentage point of growth among the three countries. The results of this study may have implications as to how we measure a Federal Reserve Chairman's and a central bank's performance over time.

# STUDENT AND BUSINESS ATTITUDES TOWARD THE ECONOMIC POLICIES OF THE OBAMA ADMINISTRATION

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## ABSTRACT

*This paper examines the opinions of 1,541 students and 659 business and professional people concerning the business-economic policy of the Obama administration, 8 months into the new administration. Students were surveyed from nine universities. The schools were from Arkansas (2 universities with a total of 422 students participating) : Arkansas State University (277 students) and Henderson State University (145 students), from Ohio (473 students in three colleges): the Ohio University (186 students) , Ohio State University (140 students participating) , and University of Akron (147 students) and California (646 total students participating from 4 colleges): University of California Los Angeles (321 students participating), Allan Hancock Community college (113 students), California Polytecnic College in San Luis Obispo (119 students), California Polytecnic College in San Bernardino (94 students). The business people are from the same three states and are a randomly selected group from a variety of different businesses varying in size from a retail business with 12 employees to a manufacturer employing over 2,000. They include 13 small businesses with 12 to 24 employees (total of 81 surveys were completed.), 24 medium sized firms with 25 to 100 employees with a total of 99 surveys completed, and 2 large businesses with 1,530 and 2,000 employees and a total of 284 surveys completed. Of the two large businesses one was unionized the other was not. Union membership in all businesses with a mixed retail and production population contained a union population of 21.12%. California and Ohio are strong union states while Arkansas has right to work laws making unionization rare.*

*We began by sending out over 3,000 surveys which instructors and business people were asked to participate in our survey. The business people were all contacted through their local Chamber of Commerce. We used a question opinion survey. In addition we asked 123 adults randomly selected from each state to act as a control group bringing the total number of subjects in the study to 2,323.*

*We asked for whom did you vote in the presidential election of 2008. The results were fairly close with 34.93 % voting for John McCain and 45.01% Obama and 20.06% other candidates or not voting in the last election 2008. In the last election Ohio cast their votes for Obama in a very close election, California was a strongly Obama state while John McCain won in Arkansas.*

*I examined the responses using the following x factors: Gender, Race, and College Student. Business owner, Party Affiliation, State of residency, and Major in College for students only and all turned out to be significant predictors of opinion at the .01 level.*

## THE STUDY

We looked at raw data and ran a standard regression analysis and a loglinear model to examine the following 8 independent variables to see which significant predictors of voter decisions and opinions were. Survey results of a question concerning the favorable/unfavorable attitude toward Obama's performance served as the [y-dependent variable]; gender [GEN], race [RC], age [AG], College student [CS], business owner [BO], Party Affiliation [PA], State [S], Major –College students only [M] and vote in last election[VLE] This is expressed in the functional relationship;

$$Y = X1 \text{ GEN} + X2 \text{ RC} + X3 \text{ AG} + X4 \text{ CS} + X5 \text{ BO} + X6 \text{ PA} + X7 \text{ S} + X8 \text{ M} + X9 \text{ VLE} + C$$

Of the independent variables examined we discovered that all of the eight were significant at the .01 level of significance predictors of success on the questionnaire. The groups voted along gender lines and were significant with women more likely to support Obama's policy than men especially in the business sector. Overall Women outnumbered men by 61% to 39%. Among business leaders men outnumbered women 73.08% to 26.92%. Women supported Obama's policy 48.32% where as only 36.31% of men agreed with his economic policy. The number with no opinion made up 28.09% of businesses surveyed. Women in California were significantly more supportive of Obama's policy than in either Ohio or Arkansas.

It was also discovered that the groups voting on racial lines was also significant. The number of survey participants by race was 28.02% African –American, 14.08 % Hispanic, 56.08% Caucasian, and 1.82% other or unspecified. Of the people classifying themselves as black 96.89% voted for Obama while among Caucasians Obama won by 53.89%. Among Hispanics the race was an even closer match with 38.23% voting for Obama and 37.02 % McCain with 24.75 % either not voting or voting for some other candidate. Race was most significant in Arkansas where a majority of Caucasians 79.08 % voted for McCain and a majority of black's Obama 92.32%. The difference was less significant in California and Ohio where race seems to be less of a factor.

Obama did better with students winning the election by 73.87% of the vote compared to 52.11% of business leaders. The vote was 83.04% in California, 66% in Ohio, 52.01% in Arkansas voting for Obama.

We next asked to which party you belong. Using a five point Likert scale with 1 representing strong democrat, 2 leaning democrat, 3 neither party or some other party, 4 leaning Republican and 5 strong Republican I discovered a close relationship between Party affiliation and voting in 2008 except in Arkansas, where despite the 10 to 1 lead by democrats in registered voters Obama lost by margins similar to the defeat of Al Gore and John Cary.

On the question of which state do you reside support for Obama was greatest in California, less in Ohio and weakest in Arkansas, particularly with the control and business groups.

Interestingly major in college made a big difference in level of support and was significant at the .01 level of testing. The College of business majors (economics, marketing, management, and accounting) students was slightly more supportive of McCain by 38.12% to 37.09% Obama. The Social Science majors (Sociology, History and English) overwhelmingly supported Obama by 59.01% to 14.98%. Science majors supported Obama 52.67% to 21% for McCain.

What was discovered was that students and business leaders who were women overwhelmingly supported Obama but business leaders particularly men were more cautious in their support. The most important finding was that among college students support for Obama's Policy was strongest among liberal arts majors and weak among business majors. While support for the President's policies remains strong it has definitely declined. On the question of if the election were held today student support has declined by 19.02% for Obama and business support which was weaker for Obama fell by 20.34%. There are a lot of questions about the President's economic policy.

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**Table 1**  
**Raw Data and Regression Statistics**

Factor	Raw Data	Correlation
Gender [Dummy Variable]	Female 61% Male 39%	*.0135
Age	10-7.7%; 11-19.2% ;12-34.6% 13-23%; 14-15.3%	*.002
Race	African-Amer. 78.7% White 18% Hispanic 3.3%	*.00270
College Student	Supportive: 43.04% No Opinion: 30.01% Not supportive: 24.95%	*.0016
Business owner	Supportive: 53.04% No Opinion: 30.01% Not supportive: 26.95%	*.0009
Party Affiliation	42% Democratic Party 30.01 Republican 17.19 Independent 10. 08% third Party and no opinion	*.0007
State	<u>Ohio</u> Supportive: 41.53 % No Opinion: 33.21% Not supportive: 25.26 <u>Arkansas</u> Supportive: 53.04% No Opinion: 30.01% Not supportive: 26.95%38% <u>California</u> Supportive: 53.04%	*.0023

Factor	Raw Data	Correlation
	No Opinion: 30.01% Not supportive: 16.95 %	
Major in College [ students only }	28.03% Business Related (accounting, marketing , management, economics) 24.52% Social Science (history , sociology more than 2 hrs per week 18.32% English or languages 17.7% Science (geology, math, nursing) 11.43 No Major	*.004
No significant difference exists between the data derived by using the standard correlation matrix or the F and T-Tests, and that derived from the loglinear model.		

## **PERSISTENT POVERTY IN THE U.S.**

**Inhyuck "Steve" Ha, Western Carolina University**

### **ABSTRACT**

*The U.S. national poverty had its most significant decline since the 1950's. Although poverty rates in non-metropolitan counties were higher than those in metropolitan areas, the disparity between metropolitan and non-metropolitan counties shrank. However, the issue of persistent poverty among non-metropolitan counties is still overwhelming. Most efforts to reduce rural poverty have focused on identifying the differential factors between two regions, such as natural resources, economic structure, socio-demographic characteristics, etc. Few of these efforts have explained why some counties have thrived and escaped the poverty pool successfully. This paper examines both thriving and failing counties – both metro and non-metro – to ascertain the competitive components that reduce countywide poverty. Using the US decennial census combined with county-specific data, the results show the major explanatory variables that contribute to differentials in county poverty rates. The key results suggest that external employment and regional wealth play an important role in reducing regional poverty.*

*JEL Classification: I32, R12, R58*

## ADDRESSING THE RISING COST OF COLLEGE

**Jessica Jones, Sam Houston State University**  
**Tommy C. Adams, Jr., Sam Houston State University**  
**John Reinke, Sam Houston State University**

### ABSTRACT

*It is difficult to pay for college! Tuitions have been increasing at a relentless pace. Obviously a concern that will suppress higher education must be evaluated and addressed. This study will review the recent trends in college tuitions. It will explain how extreme tuition prices can negatively affect students and institutions and evaluate the reasons behind tuition increases. Finally, it will discuss how these concerns may be addressed by students and institutions alike.*

### INTRODUCTION

The most rapidly growing obstacle for high school students as well as graduate students is the unyielding rate of growth in college tuitions over the past decade. Students want to avoid every purchase possible in order to budget enough for what's a must. Textbooks are too high, supplemental materials are too high, calculators, pens, pencils, transportation to class, a place to sleep, and food to nourish their minds. It has all become more and more expensive. The rates of increases on many educational necessities double the overall rate of inflation. The effects aren't prejudice. Students who have worked to hold high grade point averages with the expectation of earning the benefit of assistance are being forced to let go of their dream colleges or even worse never attend. How can someone get a college education if they have to be a college graduate to afford college?

Most of the costs causes are quite obvious including tuition increases, budget cuts, reduced funding, dwindling endowments, and lack of lending services. And while there are strategies to battle these causes it is abundantly clear that innovations are needed in the area of raising funds. Students are finding ways to make up for tuition gaps left after financial aid and grants. Together colleges and students are starting to do their part to try and reverse the impact of these recent negative trends.

### CHANGES IN TUITION FROM 2008-09

Recently average in-state college tuition and fees at 4 year institutions increased by 6.4%; in one year for out-of-state, the increase was 5.2%. Public two-year colleges have seen increases of 4.7% within the past year. (College Board, 2008-09) This is scary considering two-year colleges provide education for nearly half of the college students in America. (Associated Press, 2007) Private four-year colleges are also seeing average increases of tuition around 5.9% from 2008 to 2009. (College Board, 2008-09) As of 2007 an average of 60% of students are graduating college

with debt. (Obama, 2007) With these recent tuition increases it is no doubt that this number will increase in coming years.

### **ENDOWMENTS**

Most private institutions have an easier time controlling their tuition increases because they have larger endowments to fall back on. Average private colleges have endowment shares of \$82,700 per student, where as public four-year colleges only see about \$13,800 per student. (Damast, 2008) While public universities do not have enough permanent funds to cover per student costs some prestigious schools have endowments far exceeding any concerns levied by economic hardships.

### **BUDGET CUTS**

While private colleges find excess funds through endowments public colleges are struggling even more due to state budget cuts. The economic down turn is forcing state governments to find ways to cut costs. Terry Hurtle says that 17 states are looking into midyear budget cuts that could potentially lead to midyear tuition hikes. (Damast, 2008)

In Rochester, New York, Monroe Community College is already feeling the pressure of the declining economy. An 11.2% decrease in funding has placed this college in a tight bind. (Burnsed, 2009) Recently, Monroe's enrollment rose from 17,577 to 18,210 students. This kind of growth should thrill a community college but the rapid decrease in funding leaves the institution wondering how to keep their tuition low enough to remain appealing to their target market. (Burnsed, 2009) The Delta Cost Project noted a 6.1% increase in community college enrollment accompanied by 5.9% decrease in spending per student. (Burnsed, 2009)

### **PRE-PAID PLANS MAY HELP**

Prepaid Plans allow parents to pay off their children's college tuition before they even graduate college. The prepaid program protects purchasers from future tuition increases. Though most prepaid plans are guaranteed, the current economic crisis might be turning things around. The states whose pre-paid plans are taking the hardest hits include Alabama, South Carolina, West Virginia, Tennessee and Washington. (Orman, 2009) With schools facing gaps between pre-paid funding and tuition, they have created three alternatives, freeze enrollment, redesign their programs, or charge parents the difference. (Rawls, 2009)

### **COLLABORATIONS**

A group of 20 Wisconsin private colleges have collaborated together to get a better deal on health care for students. (Damast 2008) The Coalition for College Cost Savings is a non-profit organization that brings these institutions of higher learning together in contracts for maintenance supplies and computer hardware. (Damast, 2008) Five colleges from Texas to West Virginia are offering programs where they promise to keep tuition and fees at the same rate as state flagships.

(Damast, 2009) While these programs seem fantastic in the eyes of students, one has to wonder how beneficial they are to the universities.

### **STUDENTS GETTING CREATIVE**

Dan Macias writes about a recent high school graduate, Max Stephenson. Max Stephenson was accepted into New York University, but after government aid there was still \$25,000 left to pay for his freshman tuition. (Macasai, 2008) Stephenson finally came up with a plan to ask 10,000 strangers for \$2.50-\$3.50 dollar donations. He then planned to send out pieces of his graduation hat or gown as thank you notes. (Macasai, 2008)

Sarah Scrafford examined 20 different ways that students might be able to raise money for tuition. One included finding sponsors. Some of the sponsors might just be satisfied in knowing that the student is making good grades. Other times the sponsor might ask the student to pay them a fixed amount of their future income for a period of time. (Scrafford, 2008-09)

### **SUMMARY AND CONCLUSIONS**

Increases over time could start leading to decreases in enrollment for all colleges. Higher forms of education are important to the growth of any nation. Turning students away from a higher education can only lead to a lasting negative impact on the economy.

Hopefully many other institutions will join in creating a reduction in the growth of tuition for both public and private institutions. However, if students really want to work on their education they need to work on how to pay for it. Institutions are aware of their roles in the education process, but students can sometime forget theirs. Students not receiving grants or aid should recognize it is up to them to seek out financing. Their innovative ideas and collaboration will inspire others and help to spark new ideas.

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# **AN ASSESSMENT OF TOP ECONOMISTS BASED ON HIRSCH INDEX**

**Gurumurthy Kalyanaram, GK Associates**  
**Satyanarayana Parayitam, University of Massachusetts Dartmouth**  
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## **ABSTRACT**

*There have been numerous studies to quantify the contribution of top scholars to a discipline. A popular metric is frequency of citations. However, this has an important limitation: an author having single important paper gets a lot of importance and misses out on measurement of sustained productivity. This paper borrows a recently developed metric- Hirsch index from physical sciences and employs it to assess the contribution of top economists. This metric measures the importance; significance as well as broad impact of the cumulative contribution of a scholar and helps in overcoming the above mentioned weakness(Hirsch, 2005).We employed a sample of top 50 economists and top 50 marketing scientists. The methodology and the results that follow are discussed. The analysis provides influence of top economists.*

# **THE EFFECTS OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH OF A DEVELOPING COUNTRY: FROM KAZAKHSTAN**

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**Gulzada S. Baimukhamedova, Kazakh Academy of Transport and  
Communications**

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## **ABSTRACT**

*This paper investigates a relationship between foreign direct investment (FDI) inflows, exchange rate, and economic growth of a developing country, and their effects on major economic activities in the nation. This paper examines macroeconomic activity variables of gross domestic product, fixed capital investment, employment ratio, retail trade turnover, industrial production, FDI inflows, and dollar exchange rate as a control variable. The macroeconomic activity statistics of ten calendar years (1997-2006) of Kazakhstan were analyzed by using a multivariate regression model with weighted least squares estimates. The results indicate that FDI has a minimum or not a statistically significant impact on GDP growth of Kazakhstan. The paper argues that a resource-seeking FDI has a minimal effect on improving the economic growth of developing countries. In other words, the resource-seeking FDI might have a minimal effect on achieving economic growth and national competitiveness of host countries, but not as much manufacturing-based FDI does. Finally, this paper suggest policymakers of Kazakhstan should consider strategic goals of FDI to maximize its benefits into the economy.*

## **INTRODUCTION**

Porter (1990a) proposed the national competitiveness “diamond” model and applied this method to consider a wide range of reasons as to why some nations can gain competitive advantages in international markets. He presented four factors that determine the creation of a nation's competitive advantages: factor conditions, demand conditions, relevant and supporting industries, and firm strategy and structure. Porter further discussed the four stages of competitive development: factor-driven, investment-driven, innovation-driven, and wealth-driven stages. Consequently, countries pass through these four stages in creating competitive advantage of the nation and in enhancing economic prosperity. However, this model has been criticized due to the inapplicability of the model to small and developing economies, and its overlooking the roles of multinational enterprises (MNEs) and foreign direct investment (FDI). Professor Porter did acknowledge the fact that, at least for developing countries, foreign owned MNEs may serve to seed industrial clusters and thus contribute to the upgrading of the national diamond.

Nevertheless, the notion of national competitiveness is debatable (see Thompson, 2004). Porter (1990a, 1990b) argued that the national competitiveness of a nation may not rely on the whole economy but in specific industries. Such understanding underlines the distinct strengths of individual industries in leading industrial countries and their corresponding arrangement of national clusters in these industries. These patterns of industry specialization are well illustrated by the business profiles of the United States, Japan, and Germany. The United States appears to be strong, primarily in high-technology industries, especially information technology, life sciences, and in a number of service industries such as management consulting, financial services, and motion pictures. Japan has been particularly strong in the design and complex assembly manufacturing of consumer electronics, cameras, photocopiers, machine tools, and cars. The competitive advantage of Germany is quite similar to that of the Japanese profile although it is particularly strong in the areas of design, manufacture and distribution of a variety of industries such as machinery, cars, and chemicals.

A brief overview of the above industry-specific competitive advantages highlights the significance of the concept of national competitiveness, however, this national competitiveness concept can be seen to indicate that the performance of firms can be related back toward the national conditions within which these firms operate (see Caspar, 2000; Haake, 2002). Successful development of major industries can be achieved through national policies directed toward achieving a sustainable growth in national productivity and enhancing the competitiveness of the nation's industries (see Hohenthal, Johanson, & Johanson, 2003). Despite the high level of interest in the role of leading industries in building national competitiveness, it is still not very clear what major industries can help in leveraging national economies into the global marketplace.

With this in mind, Kazakhstan has captured the attention of the world with extraordinary speed, particularly in terms of its development in leading industries during the last decade. However, a large portion of economic growth of Kazakhstan was contributed by its natural resources - oil and gas industries and the mining sector. Indeed, the oil and gas sector is now Kazakhstan's biggest export category and a vital force behind the nation's economic growth. Nevertheless, it is debatable whether oil and gas industry alone can provide long-term economic development for this economy. Consequently, due to the rise in wages, shortage of professional and skillful labour, problems in exploring sufficient Greenfields, pressures of environmental protection and insufficient infrastructure, Kazakhstan is now facing new challenges. Against this backdrop, the ability to develop additional industries may be a key in creating the long term economic growth of Kazakhstan. This paper discusses the role of FDI in achieving the economic growth and the national competitiveness of Kazakhstan. Accordingly, the two objectives of this research are: (1) To examine a relationship between FDI inflows and economic growth of Kazakhstan; (2) To discuss the role of FDI in enhancing economic growth of Kazakhstan.

## **RESEARCH METHODOLOGY**

One of the primary objectives of this paper is to investigate a relationship between FDI inflows and economic growth of Kazakhstan. GDP growth should be related to those economic activities of FDI inflows, fixed capital investment, retail trade turnover, industrial production, exchange rate, and others. After a comprehensive review of the secondary data, the researchers

initially selected seven variables (indicators): growth domestic production, FDI inflows, fixed capital investment, employment, retail trade turnover, industrial production, and exchange rate. In this regard, the authors initially employ a confirmatory approach to define the relationships between independent variables and a dependent variable in a regression model. Multiple regression techniques applied to test a linear combination in explaining the dependent variable, the growth of gross domestic product. The five predictors such as FDI inflows, fixed capital investment, employment, retail trade turnover, and industrial production should determine growth domestic production (as a proxy of economic growth). In addition, exchange rate should play a role in the relations. This leads to the following hypotheses.

- H1: There is a relationship between FDI inflows and economic growth of Kazakhstan.*  
*H2: There is a relationship between fixed capital investment and economic growth of Kazakhstan.*  
*H3: There is a relationship between employment ratio and economic growth of Kazakhstan.*  
*H4: There is a relationship between retail trade turnover and economic growth of Kazakhstan.*  
*H5: There is a relationship between industrial production and economic growth of Kazakhstan.*

The raw data in the model were the ten year time series data during the period from 1997 to 2006 (source: Agency on Statistics of the Republic of Kazakhstan, 2008). Possible transformations of the data to remedy violations of various model assumptions, such as the normality on the shape of the distribution, linearity, and the relationships between independent variables are examined. The size of the sample has a direct impact on the appropriateness as well as the statistical power of multiple regression analysis. Therefore, the authors developed 40 cases sample data from the ten year time series data. In these applications, it is applied that the 0.05 significance level with one-tailed as the criterion in the test of statistical significance.

After several regression runs, a multiple regression model that includes the five independent variables: FDI inflows (X1), fixed capital investment (X2), employment ratio (X3), retail trade turnover (X4); industrial production (X5), and gross domestic product (Y) was tested empirically. The partial t-values were calculated and applied to test the statistical significance of the independent variables in the regression model (see Table 1).

Table 1  
The Outputs of Regression Analysis

Method of Estimate	Ordinary Least Squares		Weighted Least Squares #	
	Unstandardized Coefficients (S.E.)	t-value	Unstandardized Coefficients (S.E.)	t-value
(Constant)	-254627.761	-0.513	-250889.663	-0.476
X1: FDI inflows	30.405 (43.523)	0.699	27.304 (43.523)	0.617
X2: fixed capital investment	1.373 (0.516)	2.660**	1.212(0.516)	2.248**
X3: employment	78.617 (141.250)	0.557	68.144 (141.250)	0.425
X4: retail trade turnover	2184.994 (950.684)	2.298**	2195.406 (950.684)	2.137**
X5: industrial production	1072.280 (158.152)	6.780***	1055.302 (158.152)	6.452***

Regression Model :  $Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5$

Y: gross domestic product, million tenge

# Weighted least squares regression- weighted by exchange rate (tenge for 1 US dollar)

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , Coefficients are statistically significant at a 95% confidence level.

R square=0.994, Adjusted R square=0.993, Durbin-Watson statistics=1.841

F-value=1139.702 with the significance of 0.000

The R-square of 0.994 suggests that 99 percent of the total variation in the amount of “gross domestic product” can be explained by the changes of the independent variables. The adjusted R square (0.993) takes into account of the sample size and the number of independent variables included in the regression equation. The F-value of 1139.702 is significant at the 95% confidence level.

The null hypothesis H1: there is no correlation between FDI inflows and economic growth of Kazakhstan can not be rejected (t-value = 0.699). This means FDI inflows do not have a direct effect on the economic growth of Kazakhstan. It supports an argument that natural resource-seeking FDI might not have a direct effect in enhancing the economic growth of a developing country. The null hypothesis H2: there is no correlation between fixed capital investment and economic growth of Kazakhstan was rejected (t-value = 2.660). This result reinforces that fixed capital investment does have a direct effect in enhancing the economic growth of a developing country. The null hypothesis H3: there is no correlation between employment ratio and economic growth of Kazakhstan can not be rejected (t-value = 0.557). This means that the indicator of employment itself does have reflected on the indicator of economic growth. The null hypothesis H4: there is no correlation between retail trade turnover and economic growth of Kazakhstan was rejected (t-value = 2.298). This result reinforces that retail trade turnover does have a direct effect in enhancing the economic growth of a developing country. The null hypothesis H5: there is no correlation between industrial production and economic growth of Kazakhstan was rejected (t-value = 6.780). This result reinforces that industrial production does have a direct effect in enhancing the economic growth of a developing country.

Though we applied a weighted least squares regression (weighted by dollar exchange rate) to investigate the effect of exchange rate in economic activities of Kazakhstan, the results show as much also those of the ordinary least squares. This means exchange rate did not affect significantly the economic activities of Kazakhstan during the period. These measures indicate that the independent variables in the regression model are very useful in predicting the year-to-year variations of GDP. In view of the above results, this paper concludes that FDI by MNEs does not affect the GDP growth of Kazakhstan. It is noted that the economic resources controlled by MNEs and their investments make their investment decisions highly significant to the economic growth of small and/or developing countries. Emblematic of this is the fact that developing countries actively compete to attract MNEs' direct investment by promoting FDI advisory boards and various policy instruments. FDI in Kazakhstan had a minimal effect in achieving the economic growth and competitive advantages of the economy.

## DISCUSSION SUMMARY AND IMPLICATIONS

This paper argues that the government should take and implement only those industrial policies that can contribute importantly to the nation's rapid achievement of international competitiveness. As global practice tends to show that the attraction of foreign investments positively affects a country's economy, foreign investment can be seen to be one of the principal factors supporting accelerated economic growth. In particular, in developing countries like China and India, they consider attraction of foreign capital as a necessary means for their economic growth. Against the background of the developing states of the former Soviet Union, Kazakhstan's success in attracting inward investments for the past ten years has been extremely impressive, particularly as Kazakhstan is now recognized as a leading country among CIS countries in terms of attracting foreign direct investments per capita. For example, the EU and USA recognised Kazakhstan as a country with a market economy in 2001 and 2002 respectively. In the annual report of World Bank (2005), Kazakhstan is placed on the fifth level in investors' protection index along with Denmark, New Zealand, Switzerland, Singapore and is the best amongst the former CIS states.

From this presentation, it should now be clear that currently the nation's investment potential is largely based on minerals and raw materials. Consequently, their exploitation creates more than a half of the nation's gross domestic product, quality and extent of deposits utilization and the reproduction of raw material reserves play pivotal roles in the economic growth of Kazakhstan. Aiming at attracting foreign direct investment, Kazakhstan carries out a policy of ensuring macroeconomic environment stability and realizes this through the monitoring of significant measures, which contribute toward an improving investment climate within the country. Here, Kazakhstan's investment policy must adhere to the principles of stability and predictability in terms of: encouraging direct investments to such priority sectors of the economy as agriculture, manufacturing sector, industrial infrastructure, and tourism infrastructures. To the same extent, it is admirable that the government program contains a number of measures to attract multinational companies to the non-extractive sectors of the economy.

One of its priorities is the diversification and modernization of major industries, the growth of value added and high-tech components in the economy – and hence its economy is becoming self-sustained and less-oil dependent. In order to turn out the disproportions in the nation's economy, the new “Innovative Industrial Development Strategy till 2015” was adopted in 2003 and the state investment strategy has been directed at promoting investments into less attractive fields, which were declared as priority (The Administration of the President of the Republic of Kazakhstan, 2007). Kazakhstan has also identified 7 pilot cluster projects (tourism, metallurgy, textiles, construction, agriculture, food processing, oil and gas machinery building, logistics and transportation), which will establish the essence of the nation's competitiveness.

Consequently, the primary task of the government in the nearest and mid-term future has to be the continuation of structural and institutional reforms. This task should be aimed at developing competition, improvement of investment climate, strengthening of transparency and liberalisation of the economy. Maintenance and development of favourable conditions for further development of the private sector should also remain as a top priority. To the same extent, the nation's top priorities must be the promotion of FDI and MNE operations into industries of agriculture,

innovation, and manufacturing sectors in order to reduce the dependence of the economy on energy and extracting sectors and to ensure sustainable growth of the nation's economy.

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# THE EFFECTS OF THE MICHIGAN MINIMUM WAGE INCREASE ON LOW SKILLED LABOR MARKETS

Samantha Noah, Saginaw Valley State University

## ABSTRACT

*The impact the minimum wage has on fast food and other minimum wage industries has been studied several times, both at the Federal and state levels, since the enactment of the Fair Labor Standards Act in 1938. Throughout these studies, economists have obtained contradicting results supporting both the monopsony theory and the standard competitive model, leaving the policy discussion being far from being settled.*

*Along this thread of research, we propose that Michigan offers a unique setting for analysis as the minimum wage has been increased via a series of three consecutive stepped increases totaling \$2.25. Traditional competitive models suggest that such a significant increase in the wage floor will have a significant negative impact on employment levels. This impact is likely to be especially felt in markets for low-skilled labor as those individuals are disproportionately affected by mandated wage increases. Taking into consideration insight from previous research, this study will show how the starting wage distribution of new hires has shifted significantly throughout the three increases in the wage floor. In particular, what we find is that the starting wage gap between two industries – retail and fast food – has been significantly lowered by these wage increases.*

# DOES TECHNOLOGY MATTER: AN ANALYSIS OF COMPUTER AND INTERNET USAGE ON ECONOMIC GROWTH

Christopher J. Surfield, Saginaw Valley State University

## ABSTRACT

*Attached to the use of technology such as the personal computer and the Internet are concerns that these will reduce worker productivity given the distractions offered by these technologies. It also allows for service work to be transferred abroad to cheaper labor markets, thereby depressing an economy's economic output. These concerns are evaluated at the macro-economic level using 1997 to 2004 estimates of computer availability and Internet users contained in the Yearbook of Statistics and standardized measures contained in the Penn World Tables.*

*Our OLS estimates suggest that the availability of personal computers has little impact on a nation's growth in real Gross Domestic Product (GDP) per capita and real GDP per worker. We do find, however, that growth in these two measures is positively correlated with Internet users within an economy. This benefit, however, is primarily identified in developing economies as the effect is almost wholly negated in member nations of the Organization of Economic Cooperation and Development. The suggestion, therefore, is that the use of the Internet seems to be, on net, beneficial for increasing the lower- to middle-income nations' economic standard of living and worker productivity, but not that of high-income economies.*

# MACROECONOMICS ASSESSMENT RESULTS: STUDENT PERFORMANCE ACROSS MULTIPLE LEARNING OBJECTIVES

Neil Terry, West Texas A&M University  
Steve Hayward, West Texas A&M University  
Parman Reynolds, West Texas A&M University

## ABSTRACT

*This paper examines assessment results for principles of macroeconomics at a regional institution. Results are derived from 90 students taking a comprehensive final exam in macroeconomic theory in the spring of 2009. The assessment tool is an eighteen question course embedded exam created by the programs seven economics faculty. Three questions considered easy, moderate, and hard are distributed across the following six course learning objectives: (1) Identify the major measures of national economic performance; (2) Demonstrate an understanding of the causes of economic growth, business cycles, and inflation; (3) Describe the role of the Federal Reserve System and the commercial banking industry in determining the supply of money and credit in the economy; (4) Understand the impact and potential limitations of monetary policy; (5) Understand the impact and potential limitations of fiscal policy; (6) Demonstrate an understanding of the financial linkages between countries and the impact of these linkages on national economic performance and living standards.*

*Assessment results indicate learning objectives 1, 3, and 5 are concepts students understand, with class average surpassing 70% on all three learning objectives. Learning objectives 2 and 6 are areas of moderate concern, with class average surpassing 60% but not exceeding 70%. Learning objective 4, which focuses on monetary policy, is clearly an area of concern. Performance on the monetary policy questions averages an extremely low 48%. In addition, monetary policy is the only objective with student performance below 70% on the easy, moderate, and hard questions.*

# **MICROECONOMICS ASSESSMENT RESULTS: STUDENT PERFORMANCE ACROSS MULTIPLE LEARNING OBJECTIVES**

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## **ABSTRACT**

*This paper examines assessment results for principles of microeconomics at a regional institution. Results are derived from 145 students taking a comprehensive final exam in microeconomic theory in the spring of 2009. The assessment tool is an eighteen question course embedded exam created by the programs seven economics faculty. Three questions considered easy, moderate, and hard are distributed across the following six course learning objectives: (1) Identify the concepts of scarcity and opportunity cost as they relate to economics and business; (2) Identify the determinants of supply and demand and apply the supply and demand model to illustrate changes in prices and output; (3) Define and apply price elasticity of demand and supply; (4) Identify the behavior of the firm as it relates to production, price, cost, and profit with respect to alternative market structures; (5) Demonstrate the welfare effects of alternative market structures; (6) Describe how the concepts of comparative advantage and specialization lead to gains from trade.*

*Assessment results indicate learning objectives 1, 2, 3, and 6 are concepts students understand, with class average surpassing 70% on all four learning objectives. In fact, learning objectives 1 and 6 are extremely strong objectives given class average scores exceeding 80% correct. Learning objectives 4 and 5, which focus on cost of production and market structure, are clearly areas of concern. Performance on the cost of production questions averages an extremely low 44.4%. Performance on the market structure questions averages 55%. In addition, cost of production is the only objective with student performance below 70% on the easy, moderate, and hard questions.*

# CAN CULTURE EXPLAIN ECONOMIC GROWTH? A NOTE ON ISSUES REGARDING CULTURE-GROWTH STUDIES

Arnel Onesimo O. Uy, De La Salle University

## ABSTRACT

*The notion that culture (or cultural factors such as values, belief systems, political systems, and so on) affects economic develop and therefore explains growth has pre-occupied social scientists for decades. Studies have shown mixed results, some supporting that economic growth is shaped (at least in part) by cultural factors while others conclude otherwise. Intuitively, culture should affect growth since culture defines the belief systems of the people making up the economy and thus would ultimately affect economic growth. But the question is how do we show that? What appropriate variable could measure such a diverse and permanent concept?*

*This paper tried to review literature on culture and growth and tried to examine a more recent study on culture and the endogenous growth model. In conclusion, the paper highlighted some issues regarding culture-growth studies raised as well as how they can possibly be resolved.*

## INTRODUCTION

The notion that culture affects economic develop and therefore explains growth has pre-occupied social scientists for decades. Studies have shown mixed results, some supporting that economic growth is shaped (at least in part) by cultural factors while others conclude otherwise. Intuitively, culture should affect growth since culture defines the belief systems of the people making up the economy and thus would ultimately affect economic growth. But the question is how do we show that? What appropriate variable could measure such a diverse and *permanent* concept?

This paper reviews literature on culture and growth and tries to examine a more recent study on culture and the endogenous growth model. In conclusion, some issues regarding cultural-growth studies was raised and how they can *possibly* be resolved.

## CULTURE AND GROWTH

Traditionally, literature presents culture and its different constructs and economic determinants of growth as separate and distinct. Political economists and political sociologists, even social psychologists, view their respective methodologies as mutually exclusive perhaps primarily due to the level of analysis employed by each and the underlying assumptions about human behavior. After all, culture is all about behavior and how it *changes* over time – on a collective basis. Additionally, there is the issue of inadequate measures of cultural factors because until these factors enter into a quantitative analysis, the hypothesis that it affects growth (or vice versa) cannot be tested.

Motivational literature stresses the role of culture on economic achievement. It grows out naturally of Weber's Protestant Ethic thesis which gave rise to historical research by Tawney (1926, 1955), Harrison (1992) and McClelland (1961). In the 1970s, this was expanded by Inglehart (1971, 1977, 1990) by examining the shift from materialist to post-materialist value priorities which illustrate how culture can change and can thus explain a more dynamic phenomena called economic growth.

Hence, we can see from extant literature that culture is viewed as a system of basic common values that help shape the behavior of the people in a given society. This value system in most pre-industrial times takes the form of a religion and thus changes very slowly. But with industrialization and accompanying processes of modernization, these worldviews tend to become more secular, rational and open to change and thus dynamic and variable enough to be quantified.

From the social science literature, there are many operational models that described culture. Studies on culture and growth, however, cites mostly the works of Kluckhohn and Strodtbeck (1961), Hoefstede (1980, 1983, 1993), Rokeach (1968).

### Endogenous Growth Model and Culture

At the heart of the endogenous growth literature is an emphasis on the productivity of the population (Lucas 1988; Romer 1990). Unlike the "old" neoclassical models, endogenous growth models show that reproducible capital need not have decreasing returns to scale. Growth can be sustained in endogenous growth models. In particular, they assume constant returns to scale to a broad range of reproducible inputs, including human capital.

The two leading schools of thought, however, differ in their emphasis. Romer (1990), argues that Research and Development (R&D) spending is the key to new technological developments, which result in increasing social returns to social knowledge. Alternatively, Lucas (1988) argues that expansion of human capital in terms of both education and "learning by doing," also plays a pivotal role in economic growth.

Empirical endogenous growth models invariably are of the following form:

$$Y_i = \beta I_{i,0} + \Pi X_i + \varepsilon_i \quad [\text{Equation 1}]$$

where  $Y_i$  is output growth (per capita) for country  $i$ ,  $I_{i,0}$  is a set of economic variables measured at the beginning of the time period for country  $i$ . These variables include initial levels of wealth and investment in human capital, and are included because studies by Barro (1991), Helliwell (1994), Levine and Renelt (1992), and Mankiw, Romer, and Weil (1992) all find that they have a robust and positive partial correlation with economic growth.  $X_i$  is a set of "other variables" including a constant, physical capital investment rates (as a percent of GDP usually), and whatever other variables the investigator is interested in exploring. Obviously, given the preceding discussion, variable  $X$  will include achievement motivation and post-materialism.

In 1996, the study of Granato, Inglehart and Leblang or GIL spurred another round of debate regarding culture as a determinant of economic growth. Their study builds on the endogenous growth model of Levine and Renelt (1992) and incorporates two cultural dimensions into a

multivariate analysis, motivation and post-materialism using the World Values Survey (WVS). In trying to measure culture, GIL came up with an achievement motivational index using the World Values Survey (WVS) which sums up the percentage in each country emphasizing autonomy and economic achievement such as “thrift”, “saving money and things”, and “determination” minus the percentage emphasizing conformity to traditional social norms such as “obedience” and “religious faith”.

Following Equation [I], GIL regressed a nation's rate of per capita economic growth  $i$  on its initial level of per capita income and human capital investment (education spending) as well as on its rate of physical capital accumulation. As expected, the results are quite compatible with the expectations of endogenous growth theory; (1) the significant negative coefficient on the initial level of per capita income indicates that there is evidence of "conditional convergence." That is, controlling for human and physical capital investment, poorer nations grow faster than richer nations; (2) investment in human capital (education spending) has a positive and statistically significant effect on subsequent economic growth; and (3) increasing the rate of physical capital accumulation increases a nation's rate of economic growth.

In conclusion, GIL accepts that the idea that economic growth is partly shaped by cultural factors has encountered considerable resistance. One reason for this resistance, they claim is because cultural values have been widely perceived as diffuse and permanent features of given societies: if cultural values determine economic growth, then the outlook for economic development seems hopeless, because culture cannot be changed. Another reason for opposition is that standard economic arguments supposedly suffice for international differences in savings and growth rates. However, they assert that when culture is approached as something to be measured on a quantitative empirical basis, the illusion of diffuseness and permanence disappears.

GIL's study demonstrate that *both* cultural and economic arguments matter. Neither supplants the other. Future theoretical and empirical work is therefore better served by treating these "separate" explanations as complementary rather than mutually exclusive.

## ISSUES AND RESOLUTIONS

### Cultural Concepts

Hofstede defined culture as “the collective programming of the mind which distinguishes the members of one human group from another . . . culture, in this sense includes systems of values and values are among the building blocks of culture”. As such, culture relies on structures of values of its members. Kluckhohn (1951) defined value as "a conception, explicit or implicit . . . of the desirable which influences the selection from available modes, means and ends of action". Rokeach (1968) further refined this concept by stating that it refers to "abstract ideals, not tied to any specific object or situation, representing a person's belief about modes of conduct and ideal terminal modes". He further adds that values transcends attitudes toward objects and toward situations; it is a standard that guides and determines action, attitudes toward objects and situations, ideology, presentations of self to others, evaluations, judgments, justifications, comparisons of self with others, and attempts to influence others. Thus, extending it to how cultures are formed, cultures are both stable and universal concept.

While the universality of values, the essential building blocks of culture, allows researchers to compare similar value constructs across different countries, the enduring and stable aspects of values (and hence culture) makes it difficult to measure values or changes in values over a short time period to explain growth. This leads to another issue regarding the appropriate period dimensions (i.e. annual, 5-year cycles, etc.) within which changes or variations in cultural measures could be correlated or regressed. This maybe addressed by using appropriate panel data analysis or other specialized econometric or statistic models.

## **Measurement**

Culture, by definition, is a very qualitative concept. While we could use different operational constructs to measure each dimension of culture, the issue remains how do we measure culture as a whole or should we even have only one measure for culture.

Most studies in measuring culture use either a single or a set of dimensional variables (i.e. Confucian-work dynamism) separately and in a single time period. Few studies, like Hofstede's and Bonds, measures the same variables or dimension in two or more time periods. Comparable data across countries and time is not available or does not even exist.

Furthermore, there seems to be no consensus among scholars which cultural construct is superior or is at least widely accepted. I believe, this is perhaps due to the very dynamic and multi-faceted nature of culture per se.

## **Models and Methodologies**

Most common models or methodologies in factoring in culture to explain growth includes regressions and multivariate analysis. While results of studies such as Granato, Ingelhart and Leblang has shown empirically that culture is an important explanatory variable to growth, using only a dimension (those quantifiable) of culture does not really do justice to the holistic concept to of culture which we intuitively, at least, accept as a key determinant of growth.

The need for a more robust regression model which can integrate both qualitative and quantitative dimensions of culture as a pattern or holistic measure of culture, and bootstrap sampling methods would thus be primordial in coming up with a more widely acceptable empirical basis if not an irrefutable proof of what we accept intuitively as true.

## **CONCLUSION**

The question "Can culture explain economic growth?" should not be addressed with either an affirmative nor negative response. Instead, the above literature points to the intuitive and empirical basis that indeed culture at the very least, in part explains economic growth. I believe, the more pertinent question for researchers now is "how to measure the effect of culture in explaining economic growth using more robust modeling techniques" and of course, continuous sampling and data collection across different countries.

Significance-wise, studies on culture and its effect on economic growth is gaining momentum. With business becoming more and more international, profiles of national culture can

become tools for strategic choices in corporate boardrooms. Sensitivity to cultural variables will be needed for decisions as to what to do in which country. However, national cultural differences often are treated at the level of gut feelings, sometimes even as cocktail-party joke but we should view human values as serious business. Indeed, studies now should be undertaken to determine whether organizations which differ in terms of these cultural characteristics also differ in economic performance.

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