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**PAPA 5316: Regression Analysis Paper**

**Introduction**

Gross Domestic Product (GDP) is a metric used to measure a country's economy. It is the total value of all the goods that a country produces. There are a lots of factors that can effect a change in GDP. The better the quality of education a person receives the higher likelihood that they will make a higher wage than those who received a lower quality education, and thus the amount of money spent on educational programs can positively affect the GDP. Likewise, the more people there are the larger the workforce and thus a higher GDP. The more people who legally immigrate the larger the workforce so we can surmise that this too would positively affect the GDP. We can logically assume that a person who identifies as a democrat will be more open to policies that improve the socio-economic status of individuals. Thus, we can also logically conclude that those who identify with the Democratic Party would also have a positive effect on the GDP.

**Hypotheses**

Since an increase in K-12 expenditures would likely increase income for residents, I believe that the results of the analysis will show that there is a positive correlation between the GDP per resident and K-12 expenditures per resident. Similarly, since an increase in legal immigration will increase the workforce, I also think there will be a positive correlation between the number of legal immigrants per resident and the GDP per resident. Because those who affiliate with the Democratic Party are more likely to support policies that assist those in a low-socioeconomic status I believe there will be a positive correlation between the proportion of those who responded to a Gallop Poll as affiliated with the Democratic Party and the GDP per resident.

**Hypothesis 1:** The GDP per resident is positively correlated to the number of legal immigrants per resident.

**Hypothesis 2:** The GDP per resident is positively correlated to the amount of money per resident spent on K-12 education.

**Hypothesis 3:** The GDP per resident is positively correlated to the proportion of those that responded to a Gallop Poll that are affiliated with the Democratic Party.

## Results

**Table 1: Regression Analysis of**

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. regress GDP_SPCPM K12EXP_SPCPM LEGIMM_SPCPM DEMPARTY, vce(robust)

Linear regression              Number of obs   =          306
                              F(3, 302)       =          61.75
                              Prob > F             =          0.0000
                              R-squared           =          0.7093
                              Root MSE      =          10602
```

GDP_SPCPM	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
K12EXP_SPCPM	18.43526	1.66854	11.05	0.000	15.15182	21.7187
LEGIMM_SPCPM	.2515869	.0471188	5.34	0.000	.158864	.3443097
DEMPARTY	47146.26	10270.75	4.59	0.000	26934.97	67357.56
_cons	-1096.193	4746.541	-0.23	0.818	-10436.68	8244.289

Each of the variables in both models show significance at the 1% level. With respect to education expenditures, we found that for every \$1 increase in K-12 education expenditures per resident there is an \$18.44 increase in GDP per resident. We can say that with a 99% probability of being correct that the variable is having an effect. This empirical data supports Hypothesis 1.

Similarly, when we analyzed the data we also found it to show that for every 1 person increase in legal immigrants per residents there is a \$0.25 increase in GDP per resident. This is significant to the 99% confidence interval as well and supports Hypothesis 2.

For every 0.01 increase in the proportion of respondents whose party affiliation is Democrat there is a \$47,146.26 increase in GDP per resident. This is significant to the 99% confidence interval. This data supports Hypothesis 3.

For this model, K-12 education expenditures per resident, legal immigrants per resident, and proportion of respondents whose party affiliation is the Democratic Party in a Gallup Poll explain 71% of the variance in GDP per resident.

### **Discussion**

The results of the analysis show that both the amount of money spent on K-12 education per resident, the number legal immigrants per resident and the proportion of respondents whose party affiliation is the Democratic Party in a Gallup Poll are positively correlated with the GDP per resident. From this we can infer that in order to increase GDP per resident, a particular State could invest more in K-12 education or enact policy that helps ease the process of becoming a legal immigrant. With these results, we can infer that States that have a higher population of people who are affiliated with the Democratic Party will have a higher GDP per resident.

### **Limitations**

Limitations of this analysis are that the data would be that the GDP per resident variable was not adjusted for inflation for the different year. Another limitation is that Gallup Poll data is from those who have actually responded to the poll, which may be small than those who have actually voted democratic in the last election or are actual members of the Democratic Party.

## **Future Analysis**

In the future, excluding Gallop Poll data because it is only a proportion of those who have responded. Try to get better data for the party affiliation. Since illegal immigration is a large issue in the US it might be interesting to look at the effects of illegal immigration on GDP, although that data would be hard to find since most illegal immigrants are under the radar.