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Impacts of Economic Stimulus Policies on the Economic Growth of Thailand

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ABSTRACT

This research aims to explore economic stimulus policies in Thailand and their impacts on economic growth. It compares various economic stimulus policies and investigates how these policies contribute to the economic growth of Thailand. The policies include the money diversion, the fuel-price subsidy, the help-the-nation-cheque and the first-car-tax-rebate. The study uses time series data, ranging from 1973 to 2012, to analyze with the framework of Levine and Renelt (1992), using the Tobit and OLS regression models. Results from the analysis show that demand-side policies, which are the help-the-nation-cheque policy and the first-car-tax-rebate policy (after one year has passed), have a positive impacts on the economic growth of Thailand as advocated by the Keynesian economists. On the other hand, the supply-side policies, which are the money diversion and fuel-price subsidy policies have no significant impacts or even a negative impact on the economic growth of Thailand because these two policies depend much on capital intensive, low backward linkages, and low multiplier effect sectors. The supply-side policies also cannot change the perception of consumers' purchasing power well. Results from other control variables show that higher international trade and population growth rate have positive effects on the economic growth of Thailand while the school enrollment rates give negative effects due to the reduction in quality of education when the quantity of students increases. The foreign direct investment into Thailand yields no significant result, probably due to the fact that most FDI in Thailand do not contribute much to the skill improvement of Thai workforce, which in turn could have contributed to the economic growth of Thailand. The 1997 Asian economic crisis has a negative impact on the economic growth of Thailand, while the 2008 global financial crisis does not.

Keywords: economic stimulus, economic growth, policy comparison, Keynesian, Thailand
JEL Classification: E63, H21, O23

1. Introduction

Since the 1997 economic crisis, Thailand has implemented more populist policies and they have contributed significantly to the country's economic growth. For instance, the Thai government has implemented economic development policies such as the Village and Urban Community Fund, policies on social development such as the 15-year Free Education and the 30-Baht Universal Health Care, and policies to increase domestic consumption expenditures such as the help-the-nation-cheque and the first-car-tax-rebate. According to the Pareto principle which claims that managing resources effectively will benefit the majority of people, each policy can have both advantages and disadvantages to the public. Consequently, numbers of those who gain and those who lose out must be considered carefully. In this study, we will focus on four major economic-stimulus fiscal policies, namely, the money diversion policy (1975-1976), the fuel-price subsidy policy (2003-2005), the help-the-nation-cheque policy (2009) and the first-car-tax-rebate policy (2011-2012). Results from the study can help identify effects of economic-stimulus fiscal policies on Thailand's economic growth.

The money diversion policy was created to channel the fund directly and instantly to local districts for the purpose of economic development during the period of 1975-1976. It is a rural development policy for the Sub-district Administrative Organization (SAO) to be used to build roads, bridges, and canals estimated for a total value of 6 billion baht. The policy had diverted funds to over 5,000 sub-districts and created 41,000 infrastructure projects (Piputsareetum, 1975).

The fuel-price subsidy policy was created to calm down the rise of fuel prices in the Thai market as a result of the surge in the world market prices during the period of 2003-2005. The government's effort was to control the fuel prices in order to reduce their negative impacts on the public by giving subsidies to oil companies in the amount equal to the difference between the market price and the targeted (controlled) price. In the end, the government had spent a total of 92.07 billion baht under this policy (EFAI, n.d.).

The help-the-nation-cheque is a policy to cope with recession due to the low domestic consumption spending in 2009. The government announced that it wanted to increase demand and purchasing power of those who had suffered from the rise in cost of living, especially those in the low income groups. The government had distributed cheques worth 2,000 baht each to eligible citizens for the total of 15.7 billion baht (Council of Ministers, 2009).

The first-car-tax-rebate policy was implemented from the mid of 2011 to the end of 2012. The government claimed that this policy could allow low income people to own their first car, and help strengthening the competitiveness of the Thai automobile industry and the Thai economy as a whole. The government also claimed that the policy would help reduce burden on investment (buying automobiles) for the poor. The eligible citizens would receive a tax rebate after one year from the date of purchase, and each rebate would pay up to 100,000 baht per vehicle. The government had spent a total of 92 billion baht under this policy (Office of Secretary Department, 2010).

2. Literature review

The literature review of this paper is divided into two groups. The first group discusses about the role of government intervention in economic growth, while the second group argues about the role of tax rebates and government subsidies. For the first group, Levine and Renelt (1992) conclude that policy implementation can affect economic growth, and investment share in GDP is positively correlated with the growth rate. Xu (1994) claims that if government expenditure is ineffective but economic growth is still positive, economic growth in the long run is likely to be negative. Furthermore, Miyazaki (2010) finds that, in the late 1990s in Japan, the negative effect of fiscal policy was larger and more persistent than the positive effect due to the fact that large fiscal expansions in the late 1990s were inadequate for stimulating the macroeconomy in terms of the size and persistence of their policy effects. Nonetheless, the permanent tax cuts implemented in the former part of the 1990s increased consumer durable spending significantly and persistently, but this increase may reflect consumers' incentive to spend before the increase in the consumption tax rate in April 1997. On the other hand, Engen and Skinner (1992) find strong and negative effects of both government spending and taxation on long-term growth rate in such that if the government spending and taxation increase by 10 percentage points, the long-term GDP growth rate would decrease by 1.4 percentage points. Moreover, Mabugu et al. (2013) find that an expansionary fiscal policy would yield a temporary effect on GDP, and would translate into higher debt to GDP ratio. However, if the spending is used for infrastructure development, the impact would be positive for the country's total factor productivity.

For the second group of literature review which argues about the role of tax rebates and government subsidies, Modigliani and Steindel (1977) find that a tax rebate is not a particularly effective way of producing a prompt and temporary stimulus to consumption. Chandra et al. (2010) investigate the effect of tax rebate of hybrid electric vehicles in Canada and find that tax rebate markedly increased market shares in hybrid electric vehicles. However, while it could positively affect the market of hybrid cars, it negatively affected the market of other types of cars.

3. Data and Methodology

Time series data of various variables for the period of 1973–2012 are used in this study. Dummy variables with value of 1 representing periods of economic stimulation and value of 0 for otherwise are employed. The data are analyzed using the Tobit and ordinary least squares (OLS) regression models to identify effects of each economic stimulus policy and investigate how these policies contribute to the economic growth of Thailand. The Tobit model is preferred when results of the OLS regression estimator might be inconsistent as it might yield a downward-biased estimate of the slope coefficient and an upward-biased estimate of the intercept. The Tobit model using the maximum likelihood estimator is thus more consistent than the OLS model. In our Tobit model, we set the lower limit of the dependent variable (growth rate of GDP per capita or GYP) to -3.5 percent (year 1998) and the upper limit to 27 percent (year 1973). Comparing regression results from both models could help to verify the robustness of the results. Variable selection of this study is adapted from Levine and Renelt (1992). We set our equation as follows:

$$GYP_t = \beta_0 + \beta_1 TRVOL_t + \beta_2 GPO_t + \beta_3 PRESE_t + \beta_4 SE_t + \beta_5 TE_t + \beta_6 FDI_t + \beta_7 POL1_t + \beta_8 POL1\_L1_t + \beta_9 POL2_t + \beta_{10} POL2\_L1_t + \beta_{11} POL3_t + \beta_{12} POL3\_L1_t + \beta_{13} POL4_t + \beta_{14} POL4\_L1_t + \beta_{15} Crisis1_t + \beta_{16} Crisis2_t + e_t$$

where GYP_t is the average annual growth rate of GDP per capita at time t
$TRVOL_t$ is the ratio of Thailand's international trade volume to GDP at time t
GPO_t is the average annual rate of population growth at time t
$PREPE_t$ is the pre-primary school enrollment rate at time t
SE_t is the secondary school enrollment rate at time t
TE_t is the tertiary school enrollment rate at time t
FDI_t is the ratio of foreign direct investment to GDP at time t
$POL1_t$ is a dummy variable for the money diversion policy at time t (1 = stimulus periods, 0 = non-stimulus periods).
$POL1\_L1_t$ is a dummy variable for the money diversion policy with a year lag.
$POL2_t$ is a dummy variable for the fuel-price subsidy policy at time t (1 = stimulus periods, 0 = non-stimulus periods).
$POL2\_L1_t$ is a dummy variable for the fuel-price subsidy policy with a year lag.
$POL3_t$ is a dummy variable for the help-the-nation-cheque policy at time t (1 = stimulus periods, 0 = non-stimulus periods).
$POL3\_L1_t$ is a dummy variable for the help-the-nation-cheque policy with one year lag.
$POL4_t$ is a dummy variable for the first-car-tax-rebate policy at time t (1 = stimulus periods, 0 = non-stimulus periods).
$POL4\_L1_t$ is a dummy variable for the first-car-tax-rebate policy with a year lag.
$Crisis1_t$ is a dummy variable for the 1997 Asian economic crisis (1 = 1997, 0 = rest of the years).
$Crisis2_t$ is a dummy variable for the 2008 global financial crisis (1 = 2008, 0 = rest of the years).

4. Results and Discussion

Results from the analysis with the Tobit and OLS models are shown in Table 1. The Tobit model 1.1, OLS model 2.1, Tobit model 1.2, OLS model 2.2, Tobit model 1.3, and OLS model 2.3 are analyzed by using selected variables to test whether results of the same variables from different models would be the same or not (robustness check). The Tobit model 1.4 and OLS model 2.4 include all the variables for the study, thus they are the main models of the study.

Results of the main models (Tobit 1.4 and OLS 2.4) indicate that money diversion policy (POL1) has a negative and significant effect on the growth of GDP per capita. The money diversion policy is regarded as a supply-side policy which could benefit mostly large construction companies, which are in the upstream and capital intensive sector with low multiplier effects. Thus, the stimulus money seemed to fall into the hand of capital owners rather than the workers or helped to create huge ripple effect in the economy. In addition, no positive results could be identified from this policy after a year has passed (POL1_L1).

TABLE 1. Analysis Results from The Tobit Regression and OLS Regression Models

Dependent Variable Y: the average annual growth rate of GDP per capita (GYP)								
Independent Variables	**Tobit 1.1**	**OLS 2.1**	**Tobit 1.2**	**OLS 2.2**	**Tobit 1.3**	**OLS 2.3**	**Tobit 1.4**	**OLS 2.4**
X1: TRVOL	.7994515***	.7994515***	1.055619***	1.055619***	.8964191***	.8964191***	1.076632***	1.076632***
X2: GPO	3.932166	3.932166	6.337578*	6.337578	5.676378*	5.676378*	6.517075**	6.517075*
X3: PREPE	-.2361369**	-.2361369**	-.3122461**	-.3122461***	-.2697516**	-.2697516**	-.3212062***	-.3212062***
X4: SE	-.2255068	-.2255068	-.2004318	-.2004318	-.268428**	-.268428**	-.2750954***	-.2750954**
X5: TE	-.3672987*	-.3672987*	-.3792209**	-.3792209	-.4879544***	-.4879544***	-.5369299***	-.5369299***
X6: FDI	-.3749916	-.3749916	-.7212194	-.7212194	.0123103	.0123103	.3172725	.3172725
D1: POL1			-7.962535***	-7.962535**			-9.240848***	-9.240848**
D2: POL1_L1					-3.697515	-3.697515	-.8517091	-.8517091
D3: POL2			-1.346418	-1.346418			1.181214	1.181214
D4: POL2_L1					1.060349	1.060349	-.3061121	-.3061121
D5: POL3			7.678943	7.678943*			10.42181***	10.42181***
D6: POL3_L1					14.81794***	14.81794***	17.9195***	17.9195***
D7: POL4			-3.465317	-3.465317			2.774979	2.774979
D8: POL4_L1					4.789083	4.789083**	4.56337	4.56337***
D9: Crisis1	-6.680048*	-6.680048**	-5.664799*	-5.664799*	-6.550911**	-6.550911**	-6.281051**	-6.281051**
D10: Crisis2	-.5675601	-.5675601	-4.497445	-4.497445	3.014968	3.014968	-.2427482	-.2427482
T	.0187177	.0187177	-.0958902	-.0958902	.0811517	.0811517	-.1274325	-.1274325
_cons	-2.120976	-2.120976	-10.94224	-10.94224	-5.447141	-5.447141	-7.835085	-7.835085
/sigma	3.504488	-	3.024478	-	2.813234	-	2.04686	-
R^2 หรือ Pseudo R^2	0.1751	0.6785	0.2206	0.7605	0.2429	0.7928	0.3411	0.8903
Log pseudo likelihood	-106.91932	-	-101.02708	-	-98.130934	-	-85.409813	-
Number of observations	40	40	40	40	40	40	40	40

Notes: *, ** and *** denote statistical significance level at 10%, 5% and 1%, respectively.
Source: the authors, using STATA 10

The fuel-price subsidy policy (POL2) is also a supply-side policy as fuel is a major input not only for the vehicle use but also for almost all production. The regression results show that this policy yields no statistically significant results for both the current time (POL2) and the one year lag time (POL1_L1). This may be because despite the fact that the subsidy could bring down the oil price and help households reduce their expenses on fuel, the price reduction was limited to the level set by the government, which still could not change housholds' perception that their purchasing power had increased. Thus, households were still unwilling to spend more on other goods and services.

The help-the-nation-cheque policy (POL3) is a demand-side policy which put money directly into the hand of consumers. Results from the analysis show that policy in both the current time (POL3) and the one year lag time (POL3_L1) yield positive and significant effects on the growth of GDP per capita. Households got to spend the money on goods and services after receiving the cheque, creating a huge ripple effect in the economy. Using a demand-side policy to stimulate the economy during a recession is advocated by the Keynesian Economists as they argue that the government must fill in the missing demand to lift the economy out of recession.

For first-car-tax-rebate policy, results in the current time (POL4) are not statistically significant, probably due to the fact that in the first year of the policy, major automobile and automobile-part companies benefit the most from the policy. Since these companies are

relatively capital intensive, they created lower ripple effect in the economy. Although, these automobile-related companies had increased their production during the policy period, most were filled with overtime hours rather than new hires. However, when a year has passed and consumers started to receive their tax rebates, the economy was instantly stimulated by the extra income as the result from the OLS model 2.4 shows that the policy after a year lag (POL4_L1) has a positive and significant effect to the growth rate of GDP per capita. Nonetheless, the Tobit model 1.4 shows an insignificant result of this policy after a year has passed. Thus, the interpretation of this policy's effect should be viewed more carefully. The results may become clearer when there are more years of data after this policy took effect (2012).

Results for other control variables show that the ratio of Thailand's international trade volume to GDP (TRVOL) has a positive and significant effect on the growth rate of GDP per capita. Thus, more international trade should be promoted for economic growth of the country. The population growth rate (GPO) also has a positive and significant effect on the growth of GDP per capita. This GPO result implies that when the number of population has increased, the aggregate demand would also increase, which leads to an increase in supply of goods and services to accommodate the excess demand. Jones (1995) find the similar result in his study. However, countries which could benefit from the increasing population growth rate must have higher GDP growth rate than the population growth rate. Thailand and most upper middle income and high income countries usually have these qualities.

Variables related to the rates of school enrollment (PREPE, SE, and TE) all yield negative and significant effects on the growth rate of GDP per capita. When enrollment rates rise, there is more competition for limited resources in the classrooms, which leads to lower quality of education. Hence, in the long-run if the education system is not improved, higher enrollment rates with limited resources could lead to a lower skilled workforce and lower growth rate of GDP per capita. Other studies, such as Walsh and Yu (2010) also find the similar result. The problem of low quality of education is currently a major concern in Thailand.

The ratio of foreign direct investment to GDP (FDI) turns out to be statistically insignificant in this study. This is because most foreign direct investments come to Thailand to exploit low-skilled workforce and pay less attention to the skill development of Thai workers. This kind of investments cannot become a major engine of growth for the country in the long run. In addition, Borensztein et al. (1998) and Patarasuk (2005) find in their studies that the transfer of technology from foreign direct investment to Thailand is too low to have an impact on its economic development.

As expected, the 1997 Asian economic crisis (Crisis1) has a negative and significant impact on the growth of GDP per capita in Thailand. However, the 2008 global financial crisis (Crisis2) yields no significant impact to the Thai economy.

5. Conclusion

Results of this study show that demand-side economic-stimulus fiscal policies, such as the help-the-nation-cheque and the first-car-tax-rebate policies (after one year has passed) can actually stimulate the economy instantly and increase the growth rate of Thailand's GDP per capita as advocated by the Keynesian economists. On the other hand, supply-side

economic-stimulus fiscal policies, such as the money diversion and fuel-price subsidy policies have no impact or even a negative impact on the economic growth of Thailand. This is because most supply-side policies in Thailand usually benefit upstream and capital intensive sectors with low multiplier effects to the economy. Thus, when workers and consumers cannot feel the benefits of the ripple effect or change the perception of their purchasing power, they are less likely to spend more on goods and services. Results from other control variables show that higher international trade and population growth rate have positive and significant effects on the economic growth of Thailand while the school enrollment rates give negative and significant effects due to the reduction in quality of education when the quantity of students increases. The foreign direct investments into Thailand yield no significant result, probably due to the fact that most FDI in Thailand do not contribute much to the skill development of Thai workforce, which in turn could have contributed to the economic growth of Thailand. The 1997 Asian economic crisis has a negative impact on the economic growth of Thailand, while the 2008 global financial crisis does not.

In summary, before the government decides which policies to use to stimulate the economy during a recession, the government needs to take into account the true beneficiaries of the policies. In addition, the government should try not to use stimulus policies which have a tendency to have a long lag since they may not benefit the economy in time or may destabilize the economy rather than helping it. Instead, stimulus policies which can make wages, prices, or expectations to adjust quickly could act in time to alleviate the recession.

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APPENDIX

Tobit Regression Model 1.1

```
. tobit gyp trvol gpo prepe se te fdi crisis1 crisis2 t, ll(-3.5) ul(27)
      Tobit regression                                Number of obs   =         40
                                                      LR chi2(9)      =      45.39
                                                      Prob > chi2     =     0.0000
Log likelihood = -106.91932                           Pseudo R2       =     0.1751

------------------------------------------------------------------------------
         gyp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       trvol |   .7994515   .1845739     4.33   0.000     .4230107    1.175892
         gpo |   3.932166   3.637149     1.08   0.288    -3.485848    11.35018
       prepe |  -.2361369   .1146759    -2.06   0.048      -.47002   -.0022538
          se |  -.2255068   .1442978    -1.56   0.128    -.5198042    .0687905
          te |  -.3672987   .2104397    -1.75   0.091    -.7964934    .0618959
         fdi |  -.3749916   .4001939    -0.94   0.356    -1.191192    .4412092
     crisis1 |  -6.680048   3.686019    -1.81   0.080    -14.19773    .8376386
     crisis2 |  -.5675601   2.948283    -0.19   0.849    -6.580624    5.445503
           t |   .0187177   6298272     0.03   0.976    -1.265823    1.303259
       _cons |  -2.120976   11.12354    -0.19   0.850    -24.80758    20.56563
-------------+----------------------------------------------------------------
      /sigma |   3.504488   .3918136                      2.705379    4.303597
------------------------------------------------------------------------------
Obs. summary:         0  left-censored observations
                     40  uncensored observations
                      0  right-censored observations
```

Tobit Regression Model 1.2

```
. tobit gyp trvol gpo prepe se te fdi pol1 pol2 pol3 pol4 crisis1 crisis2 t, ll(-3.5) ul(27)
      Tobit regression                                Number of obs   =         40
                                                      LR chi2(13)     =      57.18
                                                      Prob > chi2     =     0.0000
Log likelihood = -101.02708                           Pseudo R2       =     0.2206

------------------------------------------------------------------------------
         gyp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       trvol |    1.055619   .2263961     4.66   0.000     .5910921    1.520145
         gpo |    6.337578   3.598419     1.76   0.090    -1.045768    13.72092
       prepe |   -.3122461   .1162751    -2.69   0.012    -.5508229   -.0736692
          se |   -.2004318   .1309984    -1.53   0.138    -.4692183    .0683548
          te |   -.3792209   .1848243    -2.05   0.050     -.758449    7.22e-06
         fdi |   -.7212194    .492839    -1.46   0.155    -1.732442    .2900027
        pol1 |   -7.962535   2.483572    -3.21   0.003    -13.0584   -2.866665
        pol2 |   -1.346418   2.325251    -0.58   0.567    -6.117438    3.424603
        pol3 |    7.678943   5.194596     1.48   0.151    -2.979487    18.33737
        pol4 |   -3.465317   3.835641    -0.90   0.374     -11.3354    4.404767
     crisis1 |   -5.664799   3.426856    -1.65   0.110    -12.69613    1.366529
     crisis2 |   -4.497445   3.767906    -1.19   0.243    -12.22855    3.233661
           t |   -.0958902   .5540649    -0.17   0.864    -1.232737    1.040957
       _cons |   -10.94224   11.79109    -0.93   0.362    -35.13556    13.25109
-------------+----------------------------------------------------------------
      /sigma |    3.024478   .3381469                      2.330658    3.718298
------------------------------------------------------------------------------

Obs. summary:          0  left-censored observations
                      40  uncensored observations
                       0  right-censored observations
```

Tobit Regression Model 1.3

```
. tobit gyp trvol gpo prepe se te fdi pol1_l1 pol2_l1 pol3_l1 pol4_l1 crisis1 crisis2 t, ll(-3.5) ul(27)
      Tobit regression                                Number of obs   =         40
                                                      LR chi2(13)     =      62.97
                                                      Prob > chi2     =     0.0000
Log likelihood = -98.130934                           Pseudo R2       =     0.2429

------------------------------------------------------------------------------
         gyp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       trvol |    .8964191    .159374     5.62   0.000     .5694107    1.223428
         gpo |    5.676378   3.120652     1.82   0.080    -.7266703    12.07943
       prepe |   -.2697516   .1009559    -2.67   0.013     -.476896   -.0626072
          se |    -.268428   .1229213    -2.18   0.038    -.5206417   -.0162143
          te |   -.4879544   .1741691    -2.80   0.009    -.8453198    -.130589
         fdi |    .0123103   .3847622     0.03   0.975    -.7771566    .8017772
      pol1_l1 |   -3.697515   2.308273    -1.60   0.121    -8.433701    1.038671
      pol2_l1 |    1.060349   2.211508     0.48   0.635     -3.47729    5.597988
      pol3_l1 |    14.81794   3.305111     4.48   0.000     8.036408    21.59946
      pol4_l1 |    4.789083   3.538313     1.35   0.187    -2.470936     12.0491
     crisis1 |   -6.550911   3.049953    -2.15   0.041     -12.8089   -.2929239
     crisis2 |    3.014968   2.537111     1.19   0.245    -2.190753    8.220689
           t |    .0811517    .522195     0.16   0.878    -.9903039    1.152607
       _cons |   -5.447141   9.804897    -0.56   0.583    -25.56513    14.67085
-------------+----------------------------------------------------------------
      /sigma |    2.813234   .3145217                      2.167889    3.458579
------------------------------------------------------------------------------

Obs. summary:          0  left-censored observations
                      40  uncensored observations
                       0  right-censored observations
```

Tobit Regression Model 1.4

```
. tobit gyp trvol gpo prepe se te fdi pol1 pol1_l1 pol2 pol2_l1 pol3 pol3_l1 pol4 pol4_l1 crisis1 crisis2 t, ll(-3.5) ul(27)
```

Tobit regression — Number of obs = 40; LR chi2(17) = 88.41; Prob > chi2 = 0.0000; Log likelihood = -85.409813; Pseudo R2 = 0.3411

gyp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
trvol	1.076632	.1595778	6.75	0.000	.7465199	1.406743
gpo	6.517075	2.46416	2.64	0.014	1.419572	11.61458
prepe	-.3212062	.0865736	-3.71	0.001	-.5002973	-.1421152
se	-.2750954	.0927301	-2.97	0.007	-.4669224	-.0832685
te	-.5369299	.1322684	-4.06	0.000	-.8105478	-.2633119
fdi	.3172725	.3766986	0.84	0.408	-.4619879	1.096533
pol1	-9.240848	1.798345	-5.14	0.000	-12.96101	-5.520689
pol1_l1	-.8517091	1.797373	-0.47	0.640	-4.569859	2.866441
pol2	1.181214	1.874006	0.63	0.535	-2.695463	5.057891
pol2_l1	-.3061121	2.01944	-0.15	0.881	-4.483643	3.871419
pol3	10.42181	3.651828	2.85	0.009	2.867434	17.9762
pol3_l1	17.9195	2.674174	6.70	0.000	12.38755	23.45145
pol4	2.774979	3.270389	0.85	0.405	-3.990337	9.540295
pol4_l1	4.56337	2.947081	1.55	0.135	-1.533131	10.65987
crisis1	-6.281051	2.368443	-2.65	0.014	-11.18055	-1.381554
crisis2	-.2427482	2.749305	-0.09	0.930	-5.930119	5.444623
t	-.1274325	.3830256	-0.33	0.742	-.9197812	.6649162
_cons	-7.835085	8.196053	-0.96	0.349	-24.78991	9.119741
/sigma	2.04686	.2288459			1.573456	2.520263

Obs. summary: 0 left-censored observations; 40 uncensored observations; 0 right-censored observations

OLS Regression Model 2.1

```
. reg gyp trvol gpo prepe se te fdi crisis1 crisis2 t, robust
```

Linear regression — Number of obs = 40; F(9, 30) = 33.68; Prob > F = 0.0000; R-squared = 0.6785; Root MSE = 4.0466

gyp	Robust Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
trvol	.7994515	.2441435	3.27	0.003	.300844	1.298059
gpo	3.932166	3.552468	1.11	0.277	-3.322941	11.18727
prepe	-.2361369	.1130986	-2.09	0.045	-.4671151	-.0051587
se	-.2255068	.1434318	-1.57	0.126	-.5184337	.06742
te	-.3672987	.1953462	-1.88	0.070	-.766249	.0316515
fdi	-.3749916	.3452983	-1.09	0.286	-1.080185	.3302017
crisis1	-6.680048	2.905318	-2.30	0.029	-12.6135	-.7465961
crisis2	-.5675601	3.32663	-0.17	0.866	-7.361445	6.226325
t	.0187177	.7540496	0.02	0.980	-1.521257	1.558692
_cons	-2.120976	9.96121	-0.21	0.833	-22.46448	18.22253

OLS Regression Model 2.2

```
. reg gyp trvol gpo prepe se te fdi pol1 pol2 pol3 pol4 crisis1 crisis2 t, robust
Linear regression                               Number of obs     =         40
                                                F( 11,    26)     =          .
                                                Prob > F          =          .
                                                R-squared         =     0.7605
                                                Root MSE          =     3.7514
```

gyp	Robust Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
trvol	1.055619	.3263736	3.23	0.003	.384748	1.726489
gpo	6.337578	4.539261	1.40	0.174	-2.993008	15.66816
prepe	-.3122461	.0953389	-3.28	0.003	-.508218	-.1162741
se	-.2004318	.1533236	-1.31	0.203	-.5155929	.1147294
te	-.3792209	.2261645	-1.68	0.106	-.8441086	.0856668
fdi	-.7212194	.9507657	-0.76	0.455	-2.675546	1.233108
pol1	-7.962535	3.325091	-2.39	0.024	-14.79736	-1.127713
pol2	-1.346418	3.260532	-0.41	0.683	-8.048537	5.355701
pol3	7.678943	4.011354	1.91	0.067	-.5665121	15.9244
pol4	-3.465317	8.06314	-0.43	0.671	-20.03934	13.1087
crisis1	-5.664799	3.142176	-1.80	0.083	-12.12363	.7940357
crisis2	-4.497445	4.168176	-1.08	0.290	-13.06525	4.070363
t	-.0958902	.6404388	-0.15	0.882	-1.412331	1.220551
_cons	-10.94224	14.38662	-0.76	0.454	-40.51436	18.62989

OLS Regression Model 2.3

```
. reg gyp trvol gpo prepe se te fdi pol1_l1 pol2_l1 pol3_l1 pol4_l1 crisis1 crisis2 t, robust
Linear regression                               Number of obs     =         40
                                                F( 11,    26)     =          .
                                                Prob > F          =          .
                                                R-squared         =     0.7928
                                                Root MSE          =     3.4894
```

gyp	Robust Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
trvol	.8964191	.205366	4.36	0.000	.4742833	1.318555
gpo	5.676378	2.923477	1.94	0.063	-.3329147	11.68567
prepe	-.2697516	.1091846	-2.47	0.020	-.4941837	-.0453195
se	-.268428	.1230759	-2.18	0.038	-.5214141	-.0154419
te	-.4879544	.1410112	-3.46	0.002	-.777807	-.1981018
fdi	.0123103	.2935413	0.04	0.967	-.5910724	.615693
pol1_l1	-3.697515	2.932669	-1.26	0.219	-9.725703	2.330674
pol2_l1	1.060349	1.821162	0.58	0.565	-2.683104	4.803802
pol3_l1	14.81794	2.198273	6.74	0.000	10.29932	19.33655
pol4_l1	4.789083	2.164619	2.21	0.036	.3396446	9.238521
crisis1	-6.550911	2.514035	-2.61	0.015	-11.71858	-1.383238
crisis2	3.014968	3.710119	0.81	0.424	-4.611292	10.64123
t	.0811517	.6697461	0.12	0.904	-1.295531	1.457835
_cons	-5.447141	8.921975	-0.61	0.547	-23.78652	12.89224

OLS Regression Model 2.4

```
. reg gyp trvol gpo prepe se te fdi pol1 pol1_l1 pol2 pol2_l1 pol3 pol3_l1 pol4 pol4_l1 crisis1 crisis2 t, robust
Linear regression                               Number of obs     =         40
                                                F( 12,    22)     =          .
                                                Prob > F          =          .
                                                R-squared         =     0.8903
                                                Root MSE          =       2.76
------------------------------------------------------------------------------
             |               Robust
         gyp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       trvol |   1.076632   .2137221     5.04   0.000     .6333991    1.519864
         gpo |   6.517075   3.468872     1.88   0.074    -.6769255    13.71107
       prepe |  -.3212062   .1081445    -2.97   0.007    -.5454843   -.0969282
          se |  -.2750954   .1132281    -2.43   0.024    -.5099161   -.0402748
          te |  -.5369299   .1546973    -3.47   0.002    -.8577525   -.2161072
         fdi |   .3172725   .4829669     0.66   0.518    -.6843395    1.318885
        pol1 |  -9.240848   3.836818    -2.41   0.025    -17.19792   -1.283776
     pol1_l1 |  -.8517091   3.791004    -0.22   0.824     -8.71377    7.010352
        pol2 |   1.181214   1.650277     0.72   0.482    -2.241252     4.60368
     pol2_l1 |  -.3061121   2.014734    -0.15   0.881    -4.484415    3.872191
        pol3 |   10.42181   2.987267     3.49   0.002     4.226602    16.61703
     pol3_l1 |    17.9195   2.512937     7.13   0.000     12.70799    23.13101
        pol4 |   2.774979   3.796527     0.73   0.473    -5.098537    10.64849
     pol4_l1 |    4.56337   .8482984     5.38   0.000     2.804107    6.322633
     crisis1 |  -6.281051    2.62235    -2.40   0.026    -11.71947   -.8426304
     crisis2 |  -.2427482   2.978876    -0.08   0.936    -6.420559    5.935062
           t |  -.1274325   .5517238    -0.23   0.819    -1.271638    1.016773
       _cons |  -7.835085   10.86008    -0.72   0.478    -30.35752    14.68735
------------------------------------------------------------------------------
```