THE IMPACT OF CHANGES IN GOVERNMENT SPENDING ON OUTPUT

by

BOYD GARRIOTT

THESIS
Presented to the Faculty of the
Honors College
The University of Texas at San Antonio
In Partial Fulfillment
Of the Requirements
For the Degree of

BACHELOR OF BUSINESS ADMINISTRATION IN ECONOMICS
WITH HIGHEST HONORS IN THE HONORS COLLEGE

THE UNIVERSITY OF TEXAS AT SAN ANTONIO
College of Business
Economics Department
December 2014

UTSA The University of Texas at San Antonio™ HONORS COLLEGE

Honors Thesis Submission Form

Student Information

Name Boyd Garriott myUTSA ID dqu618

Preferred Email boydgarriott@yahoo.com

Title of thesis The Impact of Changes in Government Spending on Output

Term of submission: FALL 2014

Degree to which thesis applies: BBA 2nd Degree

1st Major Economics 1st Minor

2nd Major 2nd Minor

Thesis Committee Members

Melody Lo
Thesis Advisor Signature

Print Name Dr. Melody Lo

Date 12-9-2014

Reader Signature

Print Name Dr. Ken Weiher

Date 12/11/14

John Merrifield
Reader Signature

Print Name Dr. John Merrifield

Date 12-11-14

Reader Signature

Print Name

Date

Honors College

Associate Dean, Dr. Ann R. Eisenberg
Signature

Date 12/18/14

Based on faculty's recommendation, I hereby ☐ Approve ☐ Deny the request.

Dean of Honors College, Dr. Richard A. Diem
Signature

Date

ACKNOWLEDGEMENTS

I would like to thank those who assisted in the writing of my thesis. First, Dr. Lo has been an amazing adviser, helping me every step of the way without fail. She is one of the smartest people I have ever met, and I was incredibly lucky that she agreed to help with this project. Dr. Weiher has been a constant source of expertise and a terrific teacher throughout my collegiate career. Dr. Merrifield, in addition to being a wonderful professor, provided great insights into framing the question of this thesis and laid a solid foundation for me to conduct future research.

December 2014

THE IMPACT OF CHANGES IN GOVERNMENT SPENDING ON OUTPUT

Boyd Garriott, B.B.A.
The University of Texas at San Antonio, 2014

Supervising Professor: Melody Lo, Ph.D.

ABSTRACT

THE IMPACT OF CHANGES IN GOVERNMENT SPENDING ON OUTPUT

Boyd Garriott, B.B.A.
The University of Texas at San Antonio, 2014

Supervising Professor: Melody Lo, Ph.D.

The purpose of this thesis was to assess the effect of changes in government spending on subsequent changes in national income, specifically during recession periods, in order to better understand the effectiveness of fiscal stimulus. This assessment was accomplished by conducting various regression analyses using a large sample set consisting of 179 countries over a period of 42 years (1970 – 2011). The robustness of the regression analyses on the full sample are ensured by first partitioning the data set into recession and expansion periods and second into subsamples based on three factors - government size, institutional inefficiency, and economic development - which may affect the effectiveness of fiscal stimulus.

The empirical evidence from my regression analyses consistently indicates that an increase in government spending during recession periods does not have a significant positive impact on the subsequent year's national income change. The only countries that indicated a positive effect were nations where the government spending accounts for more than 30% of the national income. More importantly, for the most highly developed countries (where real GDP per capita exceeds 30,000 US$) analyzed, I found that an increase in government spending had a statistically significant *negative* effect on subsequent national income change. Based on the empirical findings presented in this thesis, I conclude that fiscal stimulus is an overall ineffective policy tool to promote output growth, and, in some cases, it can potentially damage the economy.

TABLE OF CONTENTS

ABSTRACT ..... **IV**

LIST OF TABLES ..... **VI**

CHAPTER 1: BACKGROUND AND LITERATURE REVIEW **1**

1.1 KEYNES' THEORY IN POPULAR MEDIA 2
1.2 BATTLE IN THE LITERATURE 3
1.3 POTENTIAL DOWNFALLS OF KEYENESIAN THEORY 5
1.4 PURPOSE OF THIS THESIS 7

CHAPTER 2: DATA & METHODOLOGY **8**

2.1 DATA 8
2.2 METHODOLOGY 8

CHAPTER 3: RESULTS **11**

CHAPTER 4: CLOSING REMARKS AND POLICY IMPLICATIONS **18**

REFERENCES **19**

APPENDIX **21**

LIST OF TABLES

Table 1 OLS Regression Results on the Stimulus Effect Regression (1)…… 21

Table 2A Full Sample and Subsamples of Panel Regression Results on both Stimulus Effect Regression (1) and Modified Stimulus Effect Regression (2)…….. 12

Table 2B Full Sample and Subsamples of Panel Regression Results on both Extended-Version Stimulus Effect Regression (3) and Modified Extended-Version Stimulus Effect Regression (4) ……... 13

Table 3 Subsamples of Panel Regression Results on both Stimulus Effect Regression (1) and Modified Stimulus Effect Regression (2)……..…… 14

CHAPTER 1: BACKGROUND AND LITERATURE REVIEW

As 2008 began, unemployment was steadily climbing as the subprime mortgage bubble began to burst. Some of the largest investment banks in the world were beginning to crumble and collapse. Credit markets, responding to the mortgage crisis, began to tighten their belts to the point of austerity. The economy, for the first time in decades, was set on the precipice of complete and utter destruction. The government responded with action on a massive scale. Following the $450 billion Troubled Asset Relief Program of 2008 to try and save Wall Street, President Obama passed a genuine macroeconomic stimulus program in 2009 at a staggering cost of roughly $800 billion in order to stop the economy from dipping into a depression. The rest of the world began to follow suit with massive stimulus packages popping up across the globe. So why did countries spend all this money? The answer traces back to perhaps the most famous economist of all time: John Maynard Keynes.

John Maynard Keynes, a British economist, proposed the idea that government spending could "stimulate" an economy in 1936 (Davidson and Blumberg, 2009). Keynes rejected classical economic theory which suggested that economies would sort themselves out naturally in times of downturn, instead taking on the belief that governments could artificially speed the notoriously slow process along. Because recessions tend to cause uncertainty within markets, consumption and investment spending tend to slow down because of basic human psychology. With uncertainty about the future stemming from poor economic conditions, people are more inclined to save their money, instead of spending it. Due to this slowdown in spending, the entire economy tends to weaken due to large reductions in aggregate demand.

Keynes' suggestion was to revitalize a sluggish economy using government policy to make up for this spending lapse. As a government spends more, stabilizing the economy, this would reduce uncertainty, which, in theory, would allow the economy to get back on track faster by causing people to put more money into the revenue stream that would not have entered otherwise.

In order to examine the prominence of this theory today, laying the groundwork for my empirical analysis, I've utilized the following structure: section 1.1 deals with how the popular media treats Keynes' theory, section 1.2 highlights the major papers that illustrate the academic debate over this topic, section 1.3 presents the theoretical counterargument to Keynes' hypothesis, and section 1.4 explains the purpose of this thesis in regards to the former sections.

1.1 Keynes' Theory in Popular Media

It is evident that today's media seems to take for granted the fact that Keynes was right, that government spending has a causal effect on GDP growth that can even be measured and predicted. For example, one New York Times piece by Skidelsky (2008) described Keynes' idea for economic stimulus:

> "*This was his main argument for the use of government stimulus to fight a depression. There was only one sure way to get an increase in spending in the face of an extreme private-sector reluctance to spend, and that was for the government to spend the money itself.*"

In addition, Stevis (2013) published an article in the Wall Street Journal implying that a decrease in government spending has led to a slower increase in GDP growth in Europe when he wrote:

> "*Coordinated austerity in euro-area countries has stifled economic recovery.*"

An article written by Dockterman (2013) in Time Magazine reported that an estimate of Standard & Poor's evaluation of the U.S. government shutdown actually decreased GDP by 0.6% simply from the short-term loss of government spending.

Most recently of all, economist Paul Krugman (2014) wrote in the New York Times:

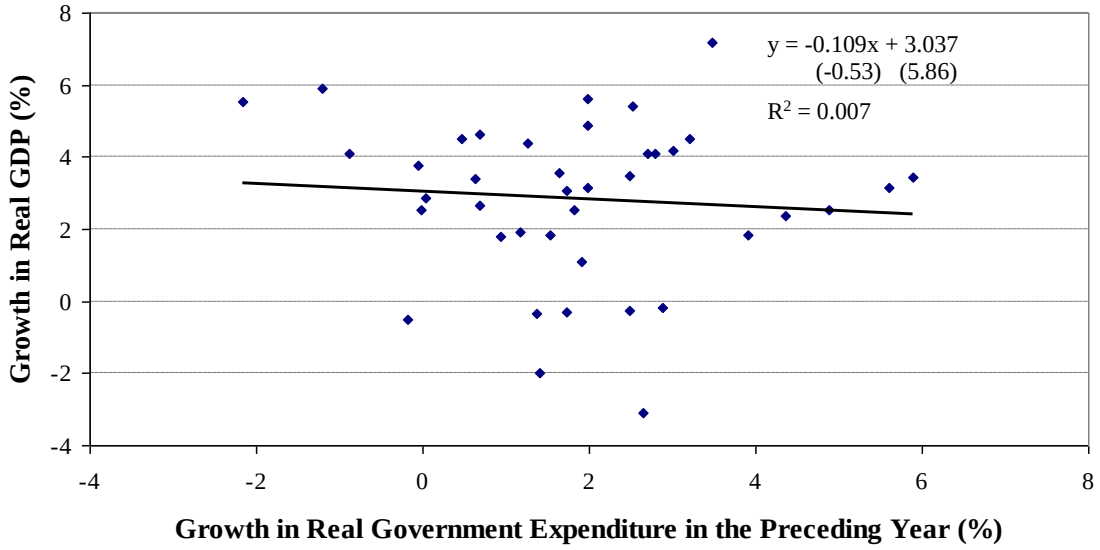
> *"Governments that did what Mr. Boehner urged (in 2008), slashing spending in the face of depressed economies, have presided over Depression-level economic slumps… In short, the story of conservative economics these past six years and more has been one of intellectual debacle…"*

In 2009, when President Obama went forward with his massive stimulus bill to help alleviate the 2008 financial crisis, he and many economists did so with Keynes on the mind. Davidson and Blumberg (2009) purported that the Obama administration's spending bill was the first real-world test of Keynes' theory. The media still suggests that we need to spend more during recessions, and policymakers continue to make this idea a reality.

With the widespread acceptance of Keynes' theory as truth, the concern rises over whether stimulus spending actually works. In my initial look into this issue, I examined the correlation between US spending and economic output. Figure 1 presents a graph for the U.S. economy

during the period of 1970 to 2011 where the annual rate of economic growth is plotted against the annual rate of growth in real federal government spending from the preceding year. It is important to keep in mind that this is a simple model simply meant to illustrate an initial look at a very complex problem. The associated regression result (see *t-statistic* reported in brackets) confirms the visual observation that no positive relationship appears to exist between growth in government spending and growth in national income.

Figure 1: U.S. Growth in Government Expenditure and GDP for 1970 – 2011



1.2 The Battle in the Literature

In stark contrast to the near unanimous media acceptance of Keynesian stimulus spending, the academic literature on the subject is awash with debate. Since the mid-1980s, researchers have devoted efforts to testing the effectiveness of government spending with a variety of statistical methods and datasets. However, the empirical studies have offered competing conclusions on the usefulness of the government in increasing economic output.

One of the first empirical studies to gain wide recognition was done by Landau (1985) where he uncovered that increases in government spending tended to be correlated with decreasing rates of GDP per capita. One of Landau's main discoveries was that this negative correlation was less with government transfers, and it tended to be the direct expenditures by government itself that reduced GDP per capita. Several other studies, including Peden and Bradley (1989), Fölster and Herekeson (2001), and Yamamura (2011), found results to support

the assertion that inefficient government spending reduced output. The results from these studies seem to drive a wedge into the Keynesian hypothesis.

However, in near direct contradiction to Landau's findings, Ram (1986) conducted a regression analysis based on a (theoretical) two-sector production framework and he concluded that it is almost impossible not to argue that government expenditure has a positive effect on economic output. The positive stimulus effect was later confirmed by several other studies, including Abu-Bader and Abu-Quar (2003), Dritsakis (2004), and Wu, Tang, and Lin (2010) which relied on the Granger Causality test (see Granger (1969)) to examine the causal relationship between the growth in government spending and subsequent increases in national income. These four studies suggest that, indeed, Keynes was right, for the most part, in his postulation that government expenditure could be used to increase output. The competing results of these studies suggest that, as opposed what is construed in the media, this issue is far from settled.

Most of these studies controlled for key variables: government size, economic growth, economic development, and degree of corruption. This paper will be utilizing most of these control variables; this is further expanded upon in Chapter 2.

In addition to the former studies concerned with the ability of the government to act as a driver of output, there is also a wide body of literature concerning stimulus spending and the existence of a fiscal multiplier – the idea that consumption by the government can result in a macroeconomic output greater than a 1:1 ratio.

Recently in this field of research, Ilzetzki, E., Mendoza E., and Vegh, C., (2012) found that "the effect of government consumption is very small on impact in most cases" by utilizing a structural vector autoregression approach, first used in Blanchard, O., Perotti, R., (2002). The two defining factors of this study were the use of quarterly macroeconomic data and the variables used to check for robustness: degree of development, exchange rate flexibility, and openness to trade. I utilize the former variable, but the latter two are excluded and would be good additions to further analysis of this issue. This paper also uses annual data, and although Ilzetzki et al (2012) argues that quarterly data is better for estimating fiscal stimulus, there are a few reasons why I use annual data.

For one, annual data allows for a much larger data set. While Ilzetzki et al (2012) utilizes 44 countries over a 10-year period, this thesis analyzes 179 countries over a 40-year period. Even

accounting for the fact that quarterly periods have four times as many data points annually, this data set contains many more observations. Additionally, Ilzetzki et al (2012) argues that "while it is reasonable to assume that fiscal authorities require a quarter to respond to output shocks, it is unrealistic to assume that an entire year is necessary." While acknowledging that, it is worth noting that quarterly responses would still be accounted for annually in an aggregate sense, so the effects would still be picked up. Combined with the convenience of amassing a larger data set, this is reason enough to use lower-frequency data as was done in Beetsma, R., Giuliodori, M., Klaassen, F. (2008) and Corsetti, G., Meier, A., Muller, G.J., (2012).

As was the case with the basic premise of the efficiency of overall government growth ability, the literature dealing with fiscal multipliers in times of economic recession seems to have considerable variance. Counter to the general conclusion from Ilzetzki et al (2012), Corsetti et al (2012) finds that there is a significantly larger fiscal multiplier during times of financial crisis, and Beetsma et al (2008) finds that "a 1% GDP increase in public spending produces a 1.2% on impact rise and a 1.6% peak impact rise in GDP." Additionally, Ramey, V.A., (2011) finds that the multiplier during stimulus spending is probably somewhere between 0.8 and 1.5.

More in line with Ilzetzi et al (2012), Harvard economist, Robert Barro, laid out his arguments against these lofty multipliers in the Wall Street Journal back in 2009, "What's the flaw? The theory (a simple Keynesian macroeconomic model) implicitly assumes that the government is better than the private market at marshaling idle resources to produce useful stuff. Unemployed labor and capital can be utilized at essentially zero social cost, but the private market is somehow unable to figure any of this out. In other words, there is something wrong with the price system… A much more plausible starting point is a multiplier of zero." Barro, citing his studies that differentiate between defense and non-defense stimulus – see Barro, R.J., (1981) – concluded that stimulus spending does not work well outside of wartime.

The differences in interpretation of the fiscal multiplier mirror the results of overall government spending efficiency. The existence of a 'stimulus effect' within economics is still hotly contested, and this thesis seeks to add to the growing body of literature on this subject by using well-established techniques on a data set larger than any previous study I am aware of.

1.3 Potential Downfalls of Keynesian Theory

Because of the theoretical justification for the Keynesian hypothesis, it is worth exploring why there are debates in the literature on a theoretical level. Why exactly wouldn't government spending increase output? There are a few reasons. For one, it is well known that modern government spending does cause one thing with near absolute certainty: government debt. Although Keynesian theory purports to cut debt when economic conditions are good, this rarely seems to be the case especially in developed countries like the United States. There is inherent opposition to the accumulation of large debt, and there is also the issue of the condition this accumulation creates, known as the crowding-out effect. The crowding-out effect is when government borrowing drives up interest rates, which "crowds out" other private investment. Consequently, this decrease in investment spending counteracts the original government spending.

However, in the last few years, this objection has been less prevalent due to the historically low interest rates that began in 2008. Instead, there are objections to the fundamental ability of government to generate real output. From the literature review, Barro (2009) provides a nuanced critique of the efficiency of government: By asserting that resources are sitting around idle for no reason, proponents of stimulus spending implicitly assume that the government can outsmart the private sector and the price system.

Dorfman (2013) argued that Keynesian stimulus cannot create jobs without stealing them first because ultimately the government spending has to be financed in three ways: taxation, borrowing, or dipping into previously saved government surplus.

The first method, taxation, is flawed on the grounds that it is a zero-sum method. When a government finances its increase in government spending by an increase in taxes, it is taking that money from people who would have otherwise spent it on consumption or investment. One component of the national income equation is increased, but two others are decreased by an equal amount, so there is no real change.

The second method, borrowing, fails to work for similar reasons to the first. First of all, borrowed money is simply money taken from the private sector. Dorfman (2013) noted that such government financing behavior is simply "moving money from your left pocket to your right pocket" and it cannot make you richer. With this in mind, about 65% of the money "borrowed" in the United States is owned within the country according to the Office of Debt Management in March of 2013. This borrowed money could be flowing into consumption or investment

elsewhere, so more than two thirds of this borrowed money is zero-sum for the same reason taxation is. The portion of treasury securities not held within the U.S. is held by foreign investors with 23% of these foreign investments being held by Chinese buyers. It is important to note that just because this borrowing was financed from foreigners does not mean it does not take a chunk out of the U.S. economy. For example, according to the data published by U.S. Census Bureau, the U.S. economy exported $9,631.2 million worth of goods to China in August of 2014. Although the U.S. government has more money to spend by foreign financing, net exports take a hit because all the foreign money spent buying treasury securities could have been spent buying American exports, diminishing the effectiveness of this form of stimulus.

The last of the three methods, dipping into previously saved government surplus, is perhaps the most reasonable of the three methods. It has been argued by many economists that such financing behavior might smooth over the growth of GDP to make it more constant, but it does not actually generate long-term economic growth. As Dorfman (2013) put it, "It is important to note that a government practicing this sort of Keynesian economic manipulation is not actually creating jobs through stimulus spending in a dynamic, business cycle sense. Instead, the government is shifting jobs from periods when the economy is doing well to times when the economy is doing poorly. There is no net gain in jobs over a full business cycle". Most importantly, this financing behavior is only feasible if a country holds a budget surplus, which is not a usual circumstance for many countries, especially the United States.

1.4 The Purpose of this Thesis

While the media tends to assume that Keynes is correct by default, Figure 1 seems to raise some initial questions worth looking into. Upon deeper examination, there are many academics that agree with the Keynesian spending hypothesis but also many that take issue with it. Because of the theoretical arguments and counterarguments surrounding Keynes' theory, it is under enough contention that it is worth examining.

The purpose of this thesis is to add to the growing body of literature seeking to prove or disprove the Keynesian hypothesis. It uses a data set larger than any other study that I am aware of, and it uses well-established techniques to discern the effect of government spending on corresponding output changes.

CHAPTER 2: DATA & METHODOLOGY

2.1 Data

All economic data used in this paper are annual data obtained from both the United Nations' National Accounts and the International Monetary Fund's International Financial Statistics. The initial sample covers 179 countries for the period of 1970 to 2011 (N=179, T=41). It is important to note that more than 179 countries' data is provided by the United Nations' National Accounts, but those that were selected had the full 40-plus-year range of data allowing for more uniform analyses.

The corruption data is obtained from Transparency International's Corruption Perceptions Index for the period of 1998 to 2011 and is used as the proxy for institutional inefficiency in each of the sample countries.

2.2 Methodology

To begin with the assessment of the effect of changes in government spending on subsequent economic output, I conducted time series analyses on the following regression for each of the 179 countries:

$$\Delta Y_t = \alpha + \beta \Delta G_{t-1} + \gamma \Delta Y_{t-1} + \varepsilon_{1t} \qquad (1)$$

where Δ denotes the first difference operator, ΔY_t is the economic growth rate in period *t*, measured by the percentage change in real GDP from period *t-1* to period *t*, ΔG_t is the percent change in real government spending from period *t-1* to period *t*, and ε_{1t} is a stochastic term. Note that a lag of ΔY_t is included as one of the regressors to remove potential serial correlation in the regression. The estimated coefficient for ΔG_{t-1} is the particular interest of the analysis. The stimulus hypothesis is supported if β is estimated to be significantly positive. I refer to regression (1) as the "Stimulus Effect Regression".

Following the individual time series analysis, I converted the countries into panel data due to a lack of significance in the vast majority of countries – more details on this are provided in Chapter 5 – allowing me to vastly increase the number of observations in the analysis. Using the panel data, I again ran Regression (1) on the full data set, on OECD countries, and on non-

OECD countries – this is fairly standard procedure for this type of analysis. Following this, I introduced a more innovative regression to examine of the effect of government spending specifically on economic output during recessions.

It is important to note that in Regression (1), the estimated stimulus effect is the combined effect (of an increase in government spending on economic output) from both recession periods and non-recession periods. To examine whether there is a stimulus effect *exclusively* during the recession periods, I introduced the following regression where the data is partitioned into recession periods and non-recession periods:

$$\Delta Y_{i,t} = \alpha + \beta^{RES} \times d_{1,t}\Delta G_{t-1} + \beta^{Non\text{-}RES} \times d_{2,t}\Delta G_{t-1} + \gamma\Delta Y_{t-1} + \varepsilon_{2t} \quad \text{subject to}$$

$$d_{1t} = 1;\ if\ \Delta Y_{t-1} < 0;\ otherwise\ d_{1t} = 0 \qquad (2)$$

$$d_{2t} = 1;\ if\ \Delta Y_{t-1} \geq 0;\ otherwise\ d_{2t} = 0$$

where d_{1t} (d_{2t}) is a dummy variable indicating negative (non-negative) GDP growth in period *t-1*. I refer to Regression (2) as the "Modified Stimulus Effect Regression" where the estimated β^{RES} ($\beta^{Non-RES}$) gives the effect of an increase in government spending during the recession (non-recession) periods on GDP growth. The estimated β^{RES} is the particular variable of interest of this analysis.

In order to achieve a more holistic view of government's spending effect on GDP changes, I also regressed GDP growth on the other lagged variables that make up national income: consumption, investment, and net exports (in addition to government spending):

$$\Delta Y_t = \alpha + \beta_1\Delta G_{t-1} + \beta_2\Delta C_{t-1} + \beta_3\Delta I_{t-1} + \beta_4\Delta NX_{t-1} + \gamma\Delta Y_{t-1} + \varepsilon_{3t} \qquad (3)$$

where ΔC represents the change in consumption spending, ΔI is the change in investment spending, and ΔNX represents the change in net exports. Regression (3) is referred as the "Extended-Version Stimulus Effect Regression". The stimulus hypothesis is supported if β_1 is estimated to be significantly positive. Using the same partition technique discussed earlier, I developed my final regression to assess how effective stimulus spending was specifically during recession periods:

$$\Delta Y_{i,t} = \alpha + \beta_1^{RES} \times d_{1t}\Delta G_{t-1} + \beta_1^{Non\text{-}RES} \times d_{2t}\Delta G_{t-1} \quad \text{subject to}$$
$$+ \beta_2^{RES} \times d_{1t}\Delta C_{t-1} + \beta_2^{Non\text{-}RES} \times d_{2t}\Delta C_{t-1} \qquad (4)$$
$$+ \beta_3^{RES} \times d_{1t}\Delta I_{t-1} + \beta_3^{Non\text{-}RES} \times d_{2t}\Delta I_{t-1}$$
$$+ \beta_4^{RES} \times d_{1t}\Delta NE_{t-1} + \beta_4^{Non\text{-}RES} \times d_{2t}\Delta NE_{t-1} + \gamma\Delta Y_{i,t-1} + \varepsilon_{4t,}$$

$d_{1t} = 1$; if $\Delta Y_{t-1} < 0$; otherwise $d_{1t} = 0$

$d_{2t} = 1$; if $\Delta Y_{t-1} \geq 0$; otherwise $d_{2t} = 0$

I refer to regression (4) as the "Modified Extended-Version Stimulus Effect Regression". The stimulus hypothesis is supported if β_1^{RES} is significantly positive.

To ensure my regression results were not sensitive to the relevant factors discussed in the literature, I incorporated these factors in my regression analysis to serve as robustness checks. The relevant factors discussed in the literature that could affect the size of estimated stimulus effect include the status of economic development (measured by real GDP per capita), government size (measured by the percent of the GDP made up by the government spending), and the level of institutional inefficiency (estimated by the mean rating of the Corruption Perceptions Index) in a country. To conduct the robustness check, I divided the full sample countries into four subsamples based on the size of these three factors, rerunning Regressions (1), (2), (3) and (4) for each subsample and comparing the size of $\hat{\beta}_1$ and $\hat{\beta}_1^{RES}$ (respectively) to the full sample coefficients.

CHAPTER 3: RESULTS

My results are presented in four tables: Table 1 (attached in the Appendix), Table 2A, Table 2B, and Table 3, and their associated results are reported and described in numerical order.

To begin with, Table 1, presented in the Appendix, reports the results of running the Stimulus Effect Regression (1) on each of the individual 179 countries. Of the entire data set, only 34 countries yielded a statistically significant β, and of these, 10 countries yielded a statistically significant *negative* relationship, meaning that only 13% of the sample countries in the data set showed potential evidence supporting stimulus theory. I arranged countries with a significant positive stimulus effect (of $\hat{\beta}$) on the top of Table 1, followed by countries with a significant negative $\hat{\beta}$, and lastly followed by countries with $\hat{\beta}$ not significantly different from zero.

Given that fact that each individual country only has 40 data points available, the lack of statistical significance (as seen in Table 1) in the majority of countries could be the result of limited observations entering the regression analysis. To increase the number of observations in the regression analysis, the rest of the study uses a panel regression approach. Table 2A reports the panel regression results on Regression (1) of the "Stimulus Effect Regression" and Regression (2) of the "Modified Stimulus Effect Regression"

The results from Regression (1) seem to give ample evidence of effective government stimulus at first glance. In particular, for the full sample of 179 countries, the estimated stimulus effect is positive ($\hat{\beta}$ = 0.034) and statistically significant at the 1% level. In addition, the effect is also significantly positive for both the OECD subsample ($\hat{\beta}$=0.089) and non-OECD subsample ($\hat{\beta}$=0.033), and the size of $\hat{\beta}$ for OECD countries is more than twice as large as that for non-OECD countries. However, this does not seem to illustrate the whole story when moving onto the results from Regression (2). It turns out that the estimated stimulus effect of $\hat{\beta}$ is not significant during recessions for either the full sample, or the OECD and non-OECD subsamples. On the other hand, increased government spending has a positive relationship with increased output during expansion periods at the 1% significance level for the full sample and both of the subsamples. The overall results in Table 2 suggest that government spending can push a booming economy further but that it can do little to reverse the course of a bad economy.

Table 2A. Full Sample and Subsamples of Panel Regression Results on both Stimulus Effect Regression (1) and Modified Stimulus Effect Regression (2)

Estimated Stimulus Effect		Full Sample Countries		OECD Countries		Non-OECD Countries	
Regression:		(1)	(2)	(1)	(2)	(1)	(2)
All periods:	$\hat{\beta}$	0.034***		0.089**		0.033***	
		(2.76)		(2.54)		(2.67)	
Recession periods:	$\hat{\beta}^{RES}$		0.002		0.096		0.002
			(0.09)		(0.89)		(0.07)
Non-Recession periods:	$\hat{\beta}^{Non-RES}$		0.047***		0.088***		0.046***
			(3.75)		(2.67)		(3.63)
No. of countries:		179	179	30	30	157	157
No. of observations:		7160	7160	1028	1028	6132	6132
No. of recession obs.:			1267		128		1139
No. of non-recession obs.:			5893		900		4993
R^2		0.041	0.043	0.374	0.374	0.038	0.039

Note: t-statistics are in ( ) and ***, **, and * denote 1%, 5% and 10% significance levels, respectively.

Next, I assessed the stimulus effect using Regressions (3) and (4), an extended version of Regressions (1) and (2), respectively, based on the concept of the national income equation. Table 2B reports the associated regression results. Regressions (3) and (4) seem to verify the findings from Regressions (1) and (2). While government spending appears to be a significant regressor of GDP changes in the following year ($\hat{\beta}_1 = 0.030$ for full sample, $\hat{\beta}_1 = 0.059$ for OECD countries, and $\hat{\beta}_1 = 0.029$ for non-OECD countries), this is not the case during recessions ($\hat{\beta}_1^{RES} =$ 0 for full sample and both subsamples). In contrast to the lack of effect during recession periods, I again found a positive relationship between government spending and the following year's GDP growth during non-recession periods for full sample ($\hat{\beta}_1^{Non-RES} = 0.044$), OECD countries ($\hat{\beta}_1^{Non-RES} = 0.061$), and non-OECD countries ($\hat{\beta}_1^{Non-RES} = 0.044$). The overall results in Table 2B suggest that government spending might be able to further accelerate an economy that is already speeding along, but it seems that none of the components of national income can actually reverse the course of a shrinking economy.

Table 2B. Full Sample and Subsamples of Panel Regression Results on both Extended-Version Stimulus Effect Regression (3) and Modified Extended-Version Stimulus Effect Regression (4)

Estimated Stimulus Effect		Full Sample Countries		OECD Countries		Non-OECD Countries	
Regression:		(3)	(4)	(3)	(4)	(3)	(4)
All periods:	$\hat{\beta}_1$	0.030* (2.47)		0.059* (1.83)		0.029** (2.40)	
	$\hat{\beta}_2$	0.059** (3.82)		0.105** (2.22)		0.58*** (3.71)	
	$\hat{\beta}_3$	0.000 (0.33)		0.025** (2.10)		0.000 (0.27)	
	$\hat{\beta}_4$	0.000 (0.39)		0.001 (1.10)		0.000 (0.54)	
Recession periods:	$\hat{\beta}_1^{RES}$		-0.003 (-0.14)		0.082 (0.73)		-0.004 (-0.16)
	$\hat{\beta}_2^{RES}$		0.047 (1.23)		0.135 (0.93)		0.045 (1.18)
	$\hat{\beta}_3^{RES}$		-0.001 (-0.74)		-0.026 (-1.20)		-0.001 (-0.84)
	$\hat{\beta}_4^{RES}$		-0.001 (-0.44)		0.000 (0.01)		-0.001 (-0.53)
Non-Recession periods:	$\hat{\beta}_1^{Non-RES}$		0.044*** (3.61)		0.061** (2.07)		0.044*** (3.53)
	$\hat{\beta}_2^{Non-RES}$		0.067*** (4.78)		0.140*** (3.06)		0.066*** (4.66)
	$\hat{\beta}_3^{Non-RES}$		0.000 (0.60)		0.050*** (3.82)		0.000 (0.56)
	$\hat{\beta}_4^{Non-RES}$		0.001 (1.20)		0.002** (2.01)		0.002 (1.48)
No. of countries:		179	179	30	30	157	157
No. of observations:		7160	7160	1028	1028	6132	6132
No. of recession obs.:			1267		128		1139
No. of non-recession obs.:			5893		900		4993
R^2		0.057	0.059	0.408	0.425	0.053	0.055

Note: t-statistics are in ( ) and ***, **, and * denote 1%, 5% and 10% significance levels, respectively.

I then turned to the robustness check by dividing the data into three subsamples based on government size, level of corruption, and level of economic development, rerunning Regressions (1) and (2). Table 3 reports these associated regression results.

Table 3. Subsamples of Panel Regression Results on both Stimulus Effect Regression (1) and Modified Stimulus Effect Regression (2)

Panel A: Subsamples Grouped By Government Size (GS)

		Small Size Government: GS <= 10%		**Medium-Small Size Government:** 10% < GS <= 16.3%		**Medium-Large Size Government:** 16.3% < GS <= 30%		**Large Size Government:** GS > 30%	
Regression:		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
All periods:	$\hat{\beta}$	0.048**		0.057***		-0.000		0.053**	
		(1.97)		(2.94)		(-0.02)		(2.24)	
Recession periods:	$\hat{\beta}^{RES}$		0.074		0.033		-0.057		0.084*
			(0.87)		(1.16)		(-1.20)		(1.85)
Non-Recession periods:	$\hat{\beta}^{Non-RES}$		0.042**		0.066***		0.025		0.040*
			(2.04)		(2.87)		(1.33)		(1.66)
No. of countries:		18	18	74	74	71	71	16	16
No. of observations:		720	720	2960	2960	2840	2840	640	640
R^2		0.092	0.093	0.051	0.070	0.039	0.045	0.110	0.113

Panel B: Subsamples Grouped By the Level of Institution Inefficiency or Corruption (Corr)

		High Corruption: Corr <= 20.6		**Medium-High Corruption:** 20.60 <= Corr <= 34		**Medium-Low Corruption:** 34 < = Corr <= 80		**Low Corruption:** Corr > 80	
Regression:		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
All periods:	$\hat{\beta}$	0.006		0.035		0.030		0.045*	
		(0.25)		(1.60)		(1.17)		(1.87)	
Recession periods:	$\hat{\beta}^{RES}$		-0.058		0.004		-0.024		-0.039
			(-1.05)		(0.11)		(-0.33)		(0.56)
Non-Recession periods:	$\hat{\beta}^{Non-RES}$		0.020		0.052**		0.053***		0.060*
			(0.80)		(2.23)		(2.68)		(1.89)
No. of countries:		14	14	59	59	57	57	14	14
No. of observations:		560	560	2360	2360	2280	2280	560	560
R^2		0.111	0.115	0.045	0.047	0.105	0.112	0.272	0.280

Panel C: Subsamples Grouped By Level of Economic Development (ED)

		Low ED:		**Medium-Low ED:**		**Medium High ED:**		**High ED:**	
		ED <= $360		$360 <= ED < $3,000		$3,000 < = ED <= $30,000		ED > $30,000	
Regression:		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
All periods:	$\hat{\beta}$	0.071*		0.018		0.057*		-0.103	
		(1.78)		(1.53)		(1.78)		(-0.77)	
Recession periods:	$\hat{\beta}^{RES}$		0.038		-0.002		0.007		-0.526*
			(0.84)		(-0.06)		(0.10)		(-1.88)
Non-Recession periods:	$\hat{\beta}^{Non-RES}$		0.098*		0.024**		0.077***		0.051
			(1.64)		(2.13)		(2.63)		(0.74)
No. of countries:		17	17	66	66	66	66	16	16
No. of observations:		680	680	2640	2640	2640	2640	640	640
R^2		0.129	0.130	0.037	0.038	0.082	0.085	0.201	0.294

Note: t-statistics are in ( ) and ***, **, and * denote 1%, 5% and 10% significance levels, respectively.

Beginning with the factor of government size (see results in Panel A), the regression results are consistent with those results established thus far. While governments seem to be able to significantly increase national output during expansion periods in an economy with any size of government (evidenced by $\hat{\beta}^{Non-RES}$ for all four subsamples being significant positive), this is not the case during recessions (evidenced by $\hat{\beta}^{RES} = 0$ for the first three subsamples) barring one exception: the group of countries with the largest governments. In this subsample of countries, government spending makes up more than 30% of the economy. This subsample's estimated stimulus effect during recession periods is significant positive with $\hat{\beta}^{RES} = 0.084$. In these countries, a 1% increase in government spending leads to an expected growth of 0.084%. This result makes sense in the context of this thesis' established framework because these countries have a government that makes up over a third of their economy, giving them the ability to have a bigger impact on GDP growth.

The regression results for the corruption subsamples reported in Panel B also seem to have intuitive implications. As countries' corruption indexes increase, indicating *less* corruption, the effect of government spending on GDP growth also tends to grow. Specifically, the estimated stimulus effect is significantly positive ($\hat{\beta} = 0.045$) only for the subsample of countries with the lowest level of corruption and insignificant ($\hat{\beta} = 0$) for the other three subsamples. This result suggests that countries with less corrupt governments are able to better utilize fiscal stimulus. However, it is important to note that even the least corrupt governments do not see a positive relationship between their spending and higher GDP growth during recession periods. This is evidenced by the fact that $\hat{\beta}^{RES}$ in all four subsamples is not significantly different from zero. Again, these results indicate that stimulus policy does not seem to be a useful way to reverse recessions.

Economic development was the last subsample examined, and Panel C reports the associated regression results; they appear to be consistent with the other findings presented thus far. In more detail, the significant positive $\hat{\beta}^{Non-RES}$ and insignificant $\hat{\beta}^{RES}$ for the first three subsamples (low, medium-low, and medium-high economic development countries) indicate that increases in government spending have a positive relationship with the following year's GDP growth during expansion phases but not recession phases. The result for the subsample of countries with the highest level of development – with GDP per capita of $30,000 or higher –

provides a striking deviation that is important to note for policymakers. For this particular subsample, the result shows that the stimulus effect does not occur during expansion periods ($\hat{\beta}^{Non-RES} = 0$) and it actually turns *negative* during recession periods ($\hat{\beta}^{RES} = -0.526$) at a statistically significant level. The policy implication for this result is that, while in most instances, government spending will not have an effect on GDP growth in developed countries, it could possibly worsen the economy. Possible explanations for this could be the crowding-out effect or business and consumer uncertainty generated by large increases in national debt.

For the last exercise of robustness check, I divided the data set into the same four subsamples as those presented in Table 3 and reran the extended-version stimulus effect Regressions of (3) and (4) instead of the simple-version stimulus effect regressions of (1) and (2). The regression results from this exercise are highly consistent with those reported in Table 3: significant positive $\hat{\beta}_1^{RES}$ occurs only in the group of countries where the government spending comprises over 30% of the economy and a significant *negative* $\hat{\beta}_1^{RES}$ occurs in the group of countries that are most highly economically developed (real GDP per capita exceeds $30,000). Due to the size of the table, I did not report the entirety of the results from this robustness exercise, but they are available upon request.

CHAPTER 4: CLOSING REMARKS AND POLICY IMPLICATIONS

The economy is like a freight train. Whichever way it happens to be going, it will be going that way in the form of a large force. Trying to change that direction with government spending is like trying to throw a pebble at that freight train. The only exception to this is in countries where 30% of the economy is comprised by the central government – that's not throwing a pebble at the train; it's putting a boulder on the tracks. With that one class of exception, fiscal policy does not seem to be an effective way to reverse the train; if anything, it can make it go further in the unwanted direction for the most highly developed countries.

Based on the empirical evidence presented, I conclude that stimulus spending is not a tool that should be widely used. Historically, there has been very little evidence of positive causation from increases in government spending during recession periods to economic growth in the following years. The fact that my thesis finds little positive stimulus effect during times of recession gives support for the general concern that the hypothesized positive effects of fiscal stimulus might not outweigh the negatives. Moving forward, it would seem that stimulus spending is an unwise undertaking to combat economic slowdown, especially in highly developed countries like the United States.

With these implications in mind, it is also important to note that further work could be done to improve the quality of the empirical model. The low r-squared values suggest that other factors are likely at play, and, in further research, I would like to include exchange rate flexibility, openness to trade, and other common macroeconomic predictors as additional control regressors. Additionally, many countries practice stimulus spending while also running deficits during times of economic upturn, so these results may not be indicative of 'pure' Keynesian spending which could be another area of further inquiry. Lastly, there may be differences in the effects of direct government spending and government transfers, so separating these two categories out in the regression could also make for a useful exercise in the future.

REFERENCES

Abu-Bader, S., and Abu-Quar, A. (2003). Government expenditures, military spending and economic growth: Causality evidence from Egypt, Israel, and Syria. *Journal of Policy Modeling*, 25, 567-583.

Barro, R.J., (1981). Output effects of government purchases. Journal of Political Economy 89, 1086–1121.

Barro, Robert (2009, January 22). Government Spending Is No Free Lunch. *Wall Street Journal*. Retrieved from: http://online.wsj.com/articles/SB123258618204604599

Beetsma, R., Giuliodori, M., Klaassen, F., (2008). The effects of public spending shocks on trade balances and budget deficits in the European Union. *Journal of the European Economic Association*, 6, 414–423.

Blanchard, O., Perotti, R., (2002). An empirical characterization of the dynamic effects of changes in government spending and taxes on output. *Quarterly Journal of Economics*, 117, 1329–1368.

Corsetti, G., Meier, A., Muller, G.J., (2012). What Determines Government Spending Multipliers? *IMF Working Paper*, 12/150.

Davidson, A., and Blumberg A. (2009, January 29). Obama Gives Keynes His First Real-World Test. *National Public Radio*. Retrieved from http://www.npr.org/templates/story/story.php?storyId=100018973

Dockterman, E. (2013, October 17). Here's How Much The Government Shutdown Cost The Economy. *Time*. Retrieved from http://swampland.time.com/2013/10/17/heres-what-the-government-shutdown-cost-the-economy/

Dorfman, J. (2013, August 22). Keynesian 'Stimulus' Can't Create Jobs Without Stealing Them First. *Forbes*. Retrieved from http://www.forbes.com/sites/jeffreydorfman/2013/08/22/keynesian-stimulus-cant-create-jobs-without-stealing-them-first/

Dritsakis, N. (2004). Defense spending and economic growth: An empirical investigation for Greece and Turkey. *Journal of Policy Modeling*, 26, 249-264.

Fölster, S., Herekson, M., (2001). Growth effects of government expenditure and taxation in rich countries. *European Economic Review*, 45, 1501-1520

Granger C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica,* 37, 424-438.

Ilzetzki, E., Mendoza E., Vegh, C., (2012). How big (small?) are fiscal multipliers? *Journal of Monetary Economics*, 60, 239-254

Krugman, Paul (2014, November 6). Triumph of the Wrong. *New York Times* Retrieved from http://www.nytimes.com/2014/11/07/opinion/paul-krugman-triumph-of-the-wrong.html?_r=0

Landau, D. (1983). Government expenditure and economic growth: a cross-country study. *Southern Economic Journal*, 49, 783–792.

Landau, D., (1985). Government expenditure and economic growth in the developed countries: 1952–1976. *Public Choice*, 47, 459–477.

Office of Debt Management, Office of the Under Secretary for Domestic Finance.

Peden, E.G., Bradley, M.D., (1989). Government size, productivity, and economic growth: the postwar experience. *Public Choice*, 61, 229-245

Ram, R., (1986). Government size and economic growth: a new framework and some evidence from cross-section and time-series data. *American Economic Review*, 76, 191–203.

Ramey, V.A., (2011). Can government purchases stimulate the economy? *Journal of Economic Literature* 49, 673–685.

Skidelsky, R. (2008, December). John Maynard Keynes. *The New York Times*. Retrieved from http://topics.nytimes.com/top/reference/timestopics/people/k/john_maynard_keynes/

Stevis, M. (2013, October 22). Paper by EU Economist Backs Austerity's Critics. *The Wall Street Journal*. Retrieved from http://blogs.wsj.com/economics/2013/10/22/paper-by-eu-economist-backs-critics-of-austerity/

Wu, S. Y., Tang, J. H., and Lin, E. S., (2010). The impact of government expenditure on economic growth: How sensitive to the level of development? *Journal of Policy Modeling*, 32, 804–817.

Yamamura, E., (2011). Decomposition of the effect of government size on growth. *Economic Letters*, 112(3), 230–232.

APPENDIX

Table 1. OLS Regression Results on the Stimulus Effect Regression (1)

Country	**Stimulus Coefficient: $\hat{\beta}$**	$\hat{\gamma}$	$\mathbf{R^2}$
Albania	1.543***	-0.017	0.340
	(4.359)	(-0.130)	
Algeria	0.202***	-0.153	0.097
	(1.931)	(-1.076)	
Aruba	0.312***	0.552***	0.571
	(2.814)	(4.653)	
Brunei Darsalam	0.284***	0.143	0.327
	(3.755)	(1.048)	
China	0.011*	0.306**	0.227
	(1.786)	(1.999)	
Greece	0.263**	0.329**	0.236
	(2.161)	(2.107)	
Italy	0.446**	0.118	0.169
	(2.310)	(0.748)	
Japan	0.451**	0.259*	0.270
	(2.348)	(1.666)	
Liberia	0.331**	0.100	0.288
	(2.104)	(0.462)	
Lichtenstein	0.457*	-0.056	0.153
	(1.827)	(-0.238)	
Luxembourg	0.482*	0.219	0.154
	(1.725)	(1.387)	
Maldives	0.209**	0.109	0.106
	(1.952)	(0.705)	
Mauritius	0.293**	-0.070	0.130
	(2.336)	(-0.435)	
Mexico	0.290*	0.078	0.135
	(1.727)	(0.421)	
Micronesia	0.351**	-0.126	0.133
	(2.191)	(-0.640)	
Morocco	0.162**	-0.626***	0.358
	(2.292)	(-4.465)	
Palau	0.461***	0.278**	0.482
	(5.309)	(2.347)	
Philippines	0.296***	0.229	0.403
	(3.115)	(1.497)	
Poland	0.532***	0.409***	0.589
	(4.188)	(3.518)	
Saint Kitts and Nevis	0.118*	0.231	0.145
	(1.918)	(1.492)	
Saint Lucia	0.138*	0.215	0.120
	(1.710)	(1.389)	
Solomon Islands	0.150**	-0.062	0.132
	(2.295)	(-0.367)	
Syrian Arab Republic	0.233**	-0.127	0.107
	(1.970)	(-0.809)	
Zambia	0.089***	0.187	0.230
	(3.101)	(1.274)	
Bolivia	-0.121*	0.843***	0.511

	(-1.749)	(5.777)	
Guinea-Bissau	-0.097*	-0.046	0.112
	(-1.860)	(-0.274)	
Haiti	-0.067*	0.157	0.102
	(-1.788)	(1.012)	
Ireland	-0.250**	0.843***	0.538
	(-2.055)	(6.393)	
Kuwait	-0.658***	-0.009	0.241
	(-3.373)	(-0.060)	
Malta	-0.215***	0.875***	0.633
	(-2.59)	(7.941)	
New Caledonia	-0.206***	0.178	0.173
	(-2.709)	(1.173)	
Sao Tome and Principe	-0.085***	0.066	0.189
	(-2.929)	(0.441)	
Spain	-0.335**	0.770***	0.482
	(-2.103)	(5.855)	
Swaziland	-0.186**	0.369**	0.180
	(-2.096)	(2.428)	
Afghanistan	0.126	-0.086	0.007
	(0.478)	(-0.307)	
Andorra	-0.235	0.799***	0.443
	(-1.360)	(4.993)	
Angola	-0.026	0.537***	0.274
	(-0.681)	(3.736)	
Anguilla	-0.211	0.115	0.046
	(-1.331)	(0.626)	
Antigua and Barbuda	-0.026	0.521***	0.241
	(-0.272)	(3.214)	
Argentina	-0.075	0.310*	0.095
	(-0.940)	(1.899)	
Australia	0.224	0.019	.0054
	(1.429)	(0.121)	
Austria	-0.120	0.172	0.026
	(-0.510)	(0.982)	
Bahamas	0.240	0.234	0.165
	(1.369)	(1.355)	
Bahrain	-0.251	0.134	0.038
	(-1.163)	(0.762)	
Bangladesh	-0.041	0.312**	0.122
	(-1.280)	(2.119)	
Barbados	-0.043	0.476***	0.234
	(-1.430)	(3.262)	
Belgium	0.255	-0.017	0.052
	(1.400)	(-0.101)	
Belize	0.046	0.373**	0.150
	(0.561)	(2.458)	
Benin	0.041	-0.131	0.026
	(0.734)	(-0.799)	
Bermuda	-0.072	0.347**	0.109
	(-0.952)	(2.107)	
Bhutan	-0.051	0.146	0.033
	(-0.641)	(0.910)	
Botswana	0.066	0.456***	0.285

	(0.562)	(3.153)	
Brazil	-0.104	0.484**	0.168
	(-0.555)	(2.132)	
British Virgin Islands	0.065	0.421**	0.266
	(0.654)	(2.523)	
Bulgaria	-0.013	0.633***	0.405
	(-0.339)	(5.016)	
Burkina Faso	0.020	-0.239	0.059
	(0.256)	(-1.516)	
Burundi	-0.018	0.260	0.059
	(-0.341)	(1.499)	
Cambodia	0.037	0.558***	0.354
	(0.705)	(4.144)	
Cameroon	0.109	0.422***	0.237
	(1.135)	(2.865)	
Canada	-0.117	0.324**	0.118
	(-0.632)	(2.102)	
Cape Verde	-0.007	0.210*	0.042
	(-0.075)	(1.175)	
Cayman Islands	-0.190	0.599*	0.183
	(-0.567)	(1.731)	
Central African Republic	-0.053	0.016	0.050
	(-1.337)	(0.098)	
Chad	-0.106	0.322	0.066
	(-0.479)	(1.436)	
Chile	-0.203	0.372**	0.116
	(-0.938)	(2.203)	
China: Hong Kong SAR	0.064	0.214	0.058
	(0.350)	(1.265)	
China: Macao SAR	0.095	0.433***	0.177
	(0.654)	(2.758)	
Colombia	0.035	0.457***	0.232
	(0.635)	(3.127)	
Comoros	0.014	0.106	0.017
	(0.286)	(0.610)	
Congo	0.008	0.380**	0.150
	(0.132)	(2.488)	
Cook Islands	0.174	0.300*	0.205
	(1.171)	(1.919)	
Costa Rica	0.142	0.313*	0.163
	(0.289)	(1.834)	
Côte d'Ivoire	-0.028	0.352*	0.105
	(-0.235)	(1.765)	
Cuba	0.180	0.398	0.286
	(0.508)	(1.387)	
Cyprus	-0.106	0.314**	0.107
	(-0.726)	(2.044)	
Democratic Republic of the Congo	-0.033*	0.692***	0.458
	(-1.623)	(5.584)	
Denmark	-0.000	0.211	0.044
	(-0.001)	(1.291)	
Djibouti	0.119	-0.068	0.065
	(1.598)	(-0.416)	
Dominica	-0.133	-0.343**	0.107

	(-1.230)	(-2.051)	
Dominican Republic	0.013	0.321**	0.111
	(0.279)	(2.126)	
Ecuador	0.058	0.221	0.074
	(0.615)	(1.308)	
Egypt	0.105	0.466***	0.231
	(1.178)	(3.178)	
El Salvador	-0.008	0.732***	0.537
	(-0.085)	(6.300)	
Equatorial Guinea	0.077	0.391**	0.207
	(0.980)	(2.576)	
Fiji	-0.090	-0.106	0.056
	(-1.136)	(-0.647)	
Finland	-0.081	0.430***	0.172
	(-0.374)	(2.719)	
France	0.253	0.297**	0.196
	(1.538)	(1.990)	
French Polynesia	-0.010	-0.167	0.034
	(-0.143)	(-1.026)	
Gabon	-0.117	0.378**	0.102
	(-0.874)	(2.026)	
Gambia	-0.015	0.053	0.002
	(-0.189)	(0.291)	
Germany	-0.188	.203	0.065
	(-1.144)	(1.268)	
Ghana	-0.023	0.364**	0.111
	(-0.396)	(2.146)	
Greenland	0.078	0.140	0.071
	(1.113)	(0.899)	
Grenada	0.086	-0.041	0.031
	(1.087)	(-0.250)	
Guatemala	-0.026	0.677***	0.452
	(-0.405)	(5.443)	
Guinea	-0.039	-0.263*	0.105
	(-1.090)	(-1.705)	
Guyana	-0.019	0.537***	0.261
	(-0.458)	(3.474)	
Haiti	-0.067*	0.157	0.102
	(-1.788)	(1.012)	
Honduras	0.107	0.217	0.121
	(1.586)	(1.398)	
Hungary	0.166	0.496***	0.353
	(1.237)	(3.521)	
Iceland	-0.048	0.468***	0.238
	(-0.258)	(3.084)	
India	-0.032	0.131	0.017
	(-0.261)	(0.791)	
Indonesia	0.083	0.251	0.129
	(0.972)	(1.456)	
Iran (Islamic Republic of)	0.075	0.432***	0.268
	(0.865)	(2.786)	
Iraq	-0.054	-0.031	0.011
	(-0.535)	(-0.179)	
Israel	-0.010	0.298**	0.098

	(-0.161)	(1.977)	
Jamaica	-0.064	0.324**	0.130
	(-1.015)	(2.121)	
Jordan	-0.105	0.516***	0.201
	(-1.115)	(3.000)	
Kenya	0.023	0.393***	0.169
	(0.364)	(2.625)	
Kiribati	0.026	0.199	0.043
	(0.132)	(1.181)	
Lao People's Democratic Republic	0.047	0.276*	0.088
	(0.920)	(1.738)	
Lebanon	0.056	-0.075	0.004
	(0.372)	(-0.359)	
Lesotho	0.067	0.074	0.014
	(0.588)	(0.482)	
Libya	0.004	0.048	0.001
	(0.014)	(0.126)	
Madagascar	0.025	-0.126	0.013
	(0.328)	(-0.710)	
Malawi	0.093	-0.211	0.068
	(1.132)	(-1.362)	
Malaysia	0.121	0.092	0.066
	(1.097)	(0.614)	
Mali	0.025	-0.190	0.052
	(1.000)	(-1.171)	
Marshall Islands	0.064	0.151	0.043
	(0.903)	(0.937)	
Mauritania	-0.002	-0.023	0.001
	(-0.036)	(-0.141)	
Monaco	-0.022	0.181	0.029
	(-0.077)	(0.755)	
Mongolia	-0.011	0.701***	0.402
	(-0.663)	(4.973)	
Montserrat	-0.132	0.420***	0.198
	(-0.973)	(2.853)	
Mozambique	-0.050	0.412**	0.143
	(-0.885)	(2.479)	
Myanmar	0.098	0.680***	0.540
	(1.186)	(5.849)	
Namibia	0.009	0.063	0.004
	(0.101)	(0.383)	
Nauru	0.017	-0.128	0.012
	(0.115)	(-0.544)	
Nepal	-0.069	-0.169	0.111
	(-1.506)	(-1.113)	
Netherlands	-0.123	0.289*	0.106
	(0.864)	(1.870)	
Netherlands Antilles	-0.060	0.428***	0.133
	(-0.513)	(2.053)	
New Zealand	-0.116	0.472***	0.211
	(0.764)	(3.143)	
Nicaragua	-0.081	0.286*	0.093
	(-1.162)	(1.780)	
Niger	-0.068	0.053	0.006

	(-0.469)	(0.292)	
Nigeria	0.002	0.212	0.048
	(0.069)	(1.338)	
Norway	-0.088	0.659***	0.427
	(-0.633)	(5.208)	
Occupied Palestinian Territory	0.166	-0.244	0.060
	(1.044)	(-1.437)	
Oman	-0.054	0.227	0.058
	(-0.675)	(1.424)	
Pakistan	0.017	0.346**	0.139
	(0.811)	(2.323)	
Panama	-0.175	0.509***	0.201
	(-1.585)	(3.049)	
Papua New Guinea	0.070	0.274*	0.105
	(0.693)	(1.640)	
Paraguay	0.066	0.346**	0.154
	(0.743)	(2.217)	
Peru	-0.001	0.376**	0.139
	(-0.008)	(2.088)	
Portugal	0.007	0.444***	0.197
	(0.049)	(2.704)	
Puerto Rico	0.042	0.500***	0.279
	(0.361)	(3.219)	
Qatar	0.148	0.284*	0.170
	(1.467)	(1.798)	
Republic of Korea	0.368	0.232	0.097
	(1.218)	(1.474)	
Romania	0.043	0.700***	0.534
	(0.608)	(6.426)	
Rwanda	-0.011	-0.034	0.002
	(-0.081)	(-0.153)	
Samoa	-0.087	0.182	0.037
	(-1.073)	(1.007)	
San Marino	-0.006	0.536***	0.276
	(-0.105)	(3.745)	
Saudi Arabia	0.091	0.516***	0.327
	(1.604)	(3.969)	
Senegal	0.027	-0.173	0.029
	(0.141)	(-1.048)	
Seychelles	0.017	0.322**	0.124
	(0.208)	(1.997)	
Sierra Leone	0.083	0.586***	0.437
	(1.034)	(4.219)	
Singapore	-0.097	0.169	0.047
	(-0.887)	(1.064)	
Somalia	-0.057	-0.030	0.032
	(-0.961)	(-0.174)	
South Africa	-0.129	0.357**	0.124
	(-1.057)	(2.246)	
Sri Lanka	-0.014	0.301*	0.087
	(-0.328)	(1.848)	
St. Vincent and the Grenadines	-0.043	0.124	0.013
	(-0.466)	(0.677)	
Suriname	0.017	0.013	0.009

	(0.519)	(0.077)	
Sweden	-0.232	0.201	0.071
	(-0.935)	(1.254)	
Switzerland	0.170	0.242	0.100
	(0.946)	(1.532)	
Thailand	-0.069	0.544***	0.271
	(-0.526)	(3.704)	
Togo	0.040	0.081	0.015
	(0.546)	(0.497)	
Tonga	0.022	0.546***	0.310
	(0.481)	(3.957)	
Trinidad and Tobago	0.021	0.636***	0.410
	(0.228)	(4.815)	
Tunisia	0.007	-0.041	0.002
	(0.038)	(-0.240)	
Turkey	0.039	-0.068	0.007
	(0.456)	(-0.374)	
Turks and Caicos Islands	-0.010	0.227	0.047
	(-0.201)	(1.342)	
Tuvalu	0.069	0.040	0.039
	(1.073)	(0.235)	
United Republic of Tanzania: Mainland	0.024	0.549***	0.401
	(1.368)	(4.004)	
Uganda	-0.025	0.677***	0.437
	(-0.211)	(4.621)	
United Arab Emirates	-0.056	0.310*	0.096
	(-0.838)	(1.943)	
United Kingdom	-0.014	0.356**	0.125
	(-0.062)	(2.302)	
United States	-0.010	0.289*	0.085
	(-0.049)	(1.765)	
Uruguay	-0.056	0.504***	0.228
	(-0.449)	(3.171)	
Vanuatu	0.070	0.070	0.025
	(0.454)	(0.313)	
Venezuela	0.005	0.225	0.052
	(0.044)	(1.273)	
Vietnam	0.021	0.320	0.118
	(0.131)	(1.468)	
Zimbabwe	0.048	0.436***	0.227
	(1.034)	(2.970)	

Note: t-statistics are in ( ) and ***, **, and * denote 1%, 5% and 10% significance levels, respectively.