

# Stock Market Response to Changes in the Statutory Corporate Income Tax Rate: Comparative Analysis between Developed and Developing Economies

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## Abstract

In this study, the authors use an empirical approach to evaluate the impact of changes in the statutory corporate tax rate on stock market returns. The main objective is to investigate whether changes in income tax rates impact stock market returns and to examine the extent of this impact. According to the United Nations country classifications, the authors categorized the sample economies into two types: developed and developing<sup>1</sup>. The study further scrutinizes the differences in the outcomes when comparing developed with developing economies using a comparative study approach. Data on corporate tax rates and corresponding stock market returns are analyzed for developed economies of Japan, US and Italy, and developing economies of South Africa, Malaysia and India. The study uses panel data regression and correlation analysis of the variables of stock market returns and corporate tax rates from 1990 to 2010. The statistical analysis revealed that the only significant impact was of tax cuts on stock market returns in general, and developed countries responded more strongly to tax cuts. For a 1% tax cut in rates, the stock markets could expect an increase in returns of 0.185% in the year of the tax change. Tax hikes, however, did not reveal any significant adverse effect on stock market returns. Hence, it is pertinent to note that developed and developing economies exhibit varied behaviors toward corporate tax policies and governments could make calculated decisions, considering the consequences of their tax policies on capital markets and corporate valuations.

**Keywords:** Corporate Income Tax, Stock Market Returns, Investor Reactions, Tax Changes, Statutory Corporate Tax Rate, Stock Prices.

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<sup>1</sup> World Economic Situation and Prospects 2021, United Nations, Statistical Annex.  
Available at: <http://data.worldbank.org/about/country-classifications>.

## **Introduction**

Do tax rate changes affect the stock market returns?. When governments either increase or decrease the statutory corporate tax rate, do investors in capital markets show any reaction?. It remains an essential question researchers endeavoured to find answers to, not only from the point of view of investors but also policymakers. Governments should consider the impact of their policy decisions on the capital markets, especially where capital markets form a significant source of business financing. This study examines the relationship between the changes to the statutory corporate tax rates and their impacts on stock market returns. Almost 90% of the jurisdictions in the world today have some form of corporate income tax, where corporations are subject to income tax. When statutory corporate income tax rates increase, cash flows available to shareholders reduce, thus affecting corporate valuations (Doidge and Dyck, 2015) and affecting stock returns. Previous studies have shown that tax cuts lead to positive excess returns in countries like Germany and Slovakia (Wang and Macy, 2022). Cummins et al, (1996) and Djankov et al., (2010) have argued that lowering corporate tax rates increases capital investments. Other studies have emphasized that lower tax rates attract foreign investments and enhance a country's economic productivity (Baccini et al., 2014, Becker et al., 2012). The stock market is considered a leading indicator of economic activities and reflects investors' future expectations of the economy. This study uses an empirical investigation to evaluate the impact of changes in the statutory corporate tax rates on stock market returns. The sample countries used in the study have been categorized into developed and developing countries to assess further the differences in investor reactions in these two groups. A panel data regression method is employed on the variables of corporate tax rates and stock market returns over a period of changing tax rates. A further aspect of the study is the comparison of outcomes between developed and developing countries. The contribution of this study is two-fold firstly, it elucidates the impact of changes in statutory tax rates on stock markets and secondly, it examines the differences, if any, between outcomes of developed and developing countries.

## **Literature Review**

This study explores the issue of corporate taxation, which is how the investors in a stock market view a government's corporate tax policies and the investors' views regarding corporate taxes. A broad range of a corporation's stakeholders would be interested in the amount of tax it pays, including the shareholders and governments, customers, suppliers, and employees, as taxes also affect foreign direct investments and the economic growth of a country. Firms make various investment decisions based on the tax rates and studies reveal that tax rates are essential in influencing where firms choose to locate their debt (Arena and Roper, 2010). Where corporate tax rates are high, firms may indulge in tax avoidance schemes to divert cashflows from governments to shareholders or debt investors. When reputation is damaged due to tax avoidance causing negative information in capital markets, it negatively impacts stock prices (Graham et al., 2013). The global average corporation tax rates have fallen year-on-year from 24.52% in 2011 to 23.64% in 2021, and average rates have also fallen in every continent as shown in Table 1 below:

**Table 1: Corporate Tax Rate 2011 - 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Americas Average	29.31	28.67	28.35	27.77	27.61	27.71	28.29	28.11	27.36	27.33	27.16
Asia Average	22.91	22.72	22.13	22.00	21.98	21.41	21.08	21.21	21.18	20.96	21.43
EU Average	22.58	22.46	22.74	22.45	22.23	22.17	21.41	21.37	20.90	20.79	20.71
Europe Average	20.83	20.44	20.60	20.42	20.05	19.97	19.53	19.48	19.17	19.03	18.98
Africa Average	28.64	29.07	28.33	27.83	27.99	28.11	28.21	28.26	28.09	27.97	27.46
Global Average	24.52	24.38	24.17	23.88	23.74	23.67	24.06	24.05	23.76	23.66	23.64

Source: <https://home.kpmg/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html>

Studies in the past have concluded with contradictory results where Brooks et al. (2016) find no noticeable link between tax rates and stock returns for the United Kingdom. Mills et al. (1994) studied the investor reactions in the agribusiness sector. They found that the investors responded negatively to the Tax Reform Act 1986 of the US, where the tax system was simplified, the tax base broadened, and the corporate tax rate was reduced from 50% to 35%. Another study by Graddy et al. (1992) also found that stock returns of insurers in the US market responded negatively to the Tax Reform Debate of 1986. Wang and Macy (2021) studied the impact of corporate tax changes on 54 countries' stock index returns and concluded that the stock market had high buy and hold returns for periods of

higher tax cuts. Other studies suggested that lower taxes attract increased foreign direct investment (Becker et al., 2012; Baccini et al., 2014). No consensus is found in the studies in this area, and this study aims to elucidate this topic for a better understanding.

The short-term event study method approach has been used by many studies (Brown and Warner 1985) where researchers examined stock market reactions around the times related to tax event dates (Cutler, 1988, Givoly and Hayn, 1991). In such cases, it is pertinent to identify the event days when the tax change information enters the market as a shock, which may be a challenge. This study uses panel data ranging for a period of a few years where the tax change occurs and allows time for the effect to convert to stock market returns after the implementation of the new tax rate to assess its impact on firm performance, hence translating the same to market returns. The authors feel that this approach to evaluating the effects of tax changes is a better interpretation of firm value rather than assessing a short-term shock as an event study. The tax changes may take longer to translate into stock returns, and the results would become visible after the financial reports are published.

## **Research Objectives & Hypotheses**

### **1. Research Objectives**

This study aims to offer a perspective on corporate income tax change effects on the country's stock indices. Tax rates impact corporate valuations and hence influence investor decisions. Corporate managers must assess the impact of tax rate changes on the firm's value. The study's main objective is to determine whether corporate tax rate changes influence the stock markets and investor reactions. Secondly, to further investigate the extent of the impact and to examine if there are any differences in how investors in developed countries behave as compared to those in developing countries.

### **2. Hypotheses Development**

The authors examine the above stated objectives through the two hypotheses described below that will be tested empirically in the study.

1.  $H_0$  There is no significant impact of statutory corporate income tax rate changes on the stock market returns of a country.
2.  $H_0$  There are no major differences in how corporate tax rate changes affect the stock market returns of developed and developing economies.

## **Data and Research Methodology**

For this study, the authors use secondary data collected from multiple sources for the sample countries used in the study, such as the Tax Foundation and the major stock market indices taken from the stock exchange websites or yahoo finance. The authors have carefully chosen the samples for the study and categorized them into two groups of developed and developing countries. The developed countries selected for the study include Germany, Japan and Canada and the developing countries include Brazil, India and Indonesia. The sample countries were selected where the changes in the corporate tax rates were found from 1990 to 2010. The two variables used in the analysis are:

1. The changes in the corporate income tax rates (CITR\_chg).
2. The changes in the Stock Market Returns (SMR\_chg).

The definitions, descriptions and sources of these variables are detailed below.

### **1. Data Collection**

#### **The Corporate Tax Rates (CITR\_chg)**

Corporate income tax is taxes levied on business net profits. The rates are taken from the Tax Foundation, established in 1937, a leading independent tax policy nonprofit organization based in Washington, US. They provide research and insightful analysis at the federal, state, and global levels. The tax rates for the sample countries between the years 1990 to 2010 are selected for the examination. The annual percentage change in the tax rates are calculated for each country.

#### **Stock Market Returns (SMR\_chg)**

A stock market return is a positive or negative change in the value of equity listed on the stock exchange. The country's monthly change in stock price indices has been used in the study, and the returns have been then

annualized for valid correlational analysis. The selection of each of the sample countries' stock indices is given below.

**Germany:** The DAX—also known as the Deutscher Aktien Index or the GER40, is a stock index that represents 40 of the largest and most liquid German companies that trade on the Frankfurt Exchange.

**Canada:** The S&P/TSX Composite is used which is the headline index for the Canadian equity market.<sup>2</sup>

**Japan:** The Nikkei 225, or the Nikkei Stock Average, more commonly called the Nikkei or the Nikkei index, is a stock market index for the Tokyo Stock Exchange.

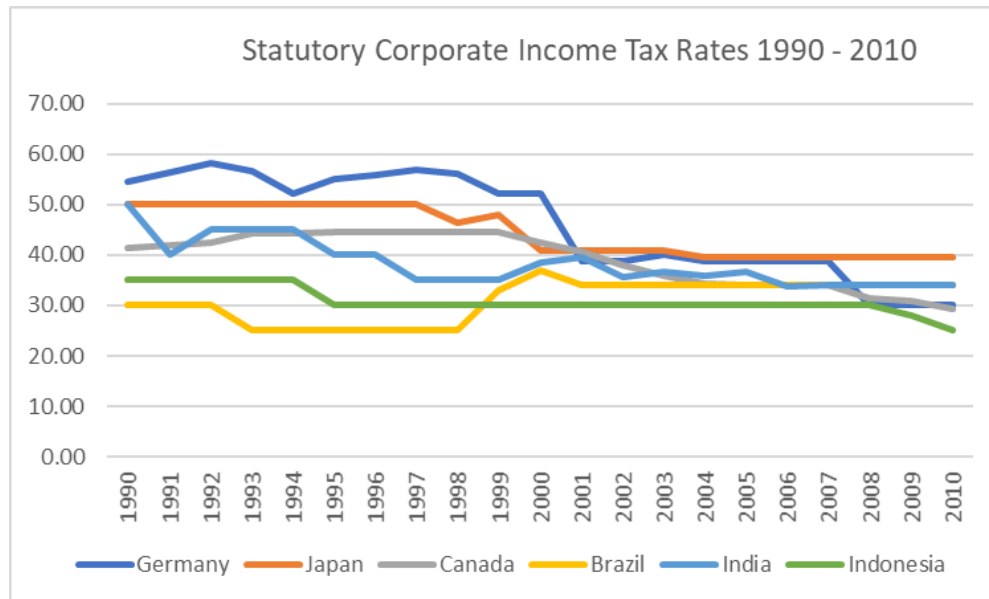
**Brazil:** The Bovespa Index (Ibovespa), the benchmark index of about 84 stocks traded on the B3 (Brasil Bolsa Balcão), has the majority of trading and market capitalization in the Brazilian stock market.

**India:** The BSE SENSEX (also known as the S&P Bombay Stock Exchange Sensitive Index or simply SENSEX) is a free-float market-weighted stock market index of 30 well-established and financially sound companies listed on the Bombay Stock Exchange.

**Indonesia:** The IDX Composite or Jakarta Composite Index (JSX) is an index of all stocks traded on the Indonesia Stock Exchange (IDX), previously known as the Jakarta Stock Exchange (JSX).<sup>3</sup>

## 2. Data Analysis & Interpretations

The statutory corporate income tax rates (CITR) for the six sample countries for twenty years from 1990 to 2010 shown in Figure 1 below.



**Figure 1: Statutory Corporate Income Tax Rates: 1990 - 2010**

Developed countries revealed a higher CITR of 43.28% during the study period compared to the developing countries (33.34%). Germany had the largest tax cuts followed by Japan, indicating a tax cut policy by these governments. Brazil and India on the other hand, adopted a tax hike policy during the early 2000s. Canada has been consistently engaging in tax cuts. The summary descriptive statistics of the CITR are shown in Table 2. The CITR distributions of Brazil, Canada and Germany show a negative skew, indicating more periods of a higher tax rate.

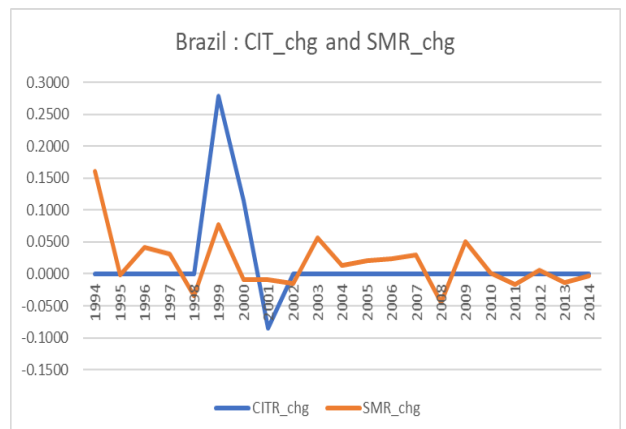
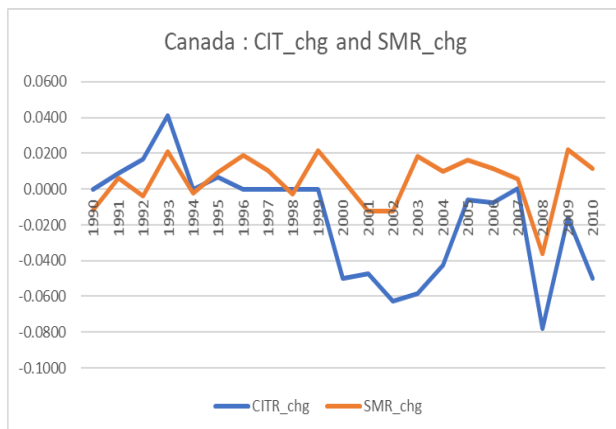
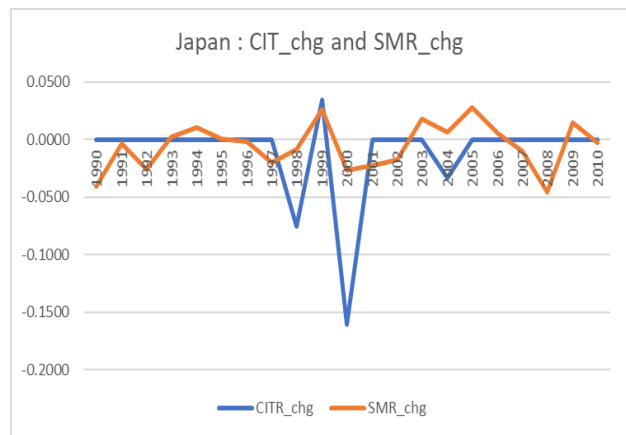
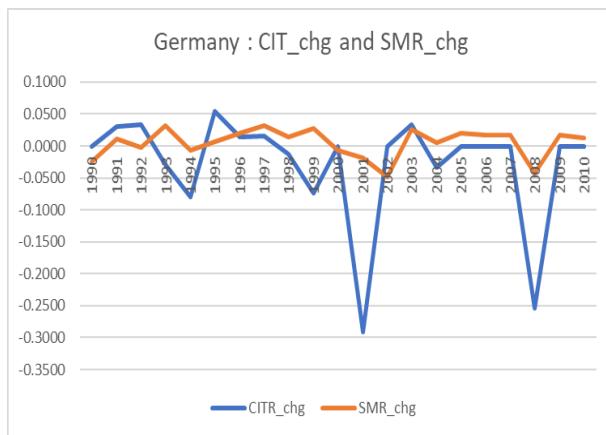
<sup>2</sup>It is the broadest in the S&P/TSX family and is the basis for multiple sub-indices including but not limited to equity indices, Income Trust Indices, Capped Indices, GICS Indices and market cap based indices.

<sup>3</sup>Indonesia Stock Exchange (Indonesian: Bursa Efek Indonesia, formerly Dutch: Verenigingvoor de Effectenhandel) is a stock exchange based in Jakarta, Indonesia. It was previously known as the Jakarta Stock Exchange (JSX) before its name changed in 2007 after merging with the Surabaya Stock Exchange (SSX). During recent years, Indonesia Stock Exchange sees fastest membership growth in Asia.

**Table 2: CITR Descriptive Statistics**

Tools Employed	Germany	Japan	Canada	Brazil	India	Indonesia
Mean	46.175	44.498	39.158	30.952	38.219	30.857
Standard Error	2.200	1.070	1.170	0.912	1.010	0.574
Median	52.030	40.870	41.450	34.000	36.594	30.000
Mode	38.900	49.980	44.600	34.000	33.990	30.000
Standard Deviation	10.080	4.903	5.361	4.177	4.627	2.632
Sample Variance	101.597	24.044	28.739	17.448	21.408	6.929
Kurtosis	-1.526	-2.070	-1.368	-1.345	0.582	0.324
Skewness	-0.322	0.151	-0.477	-0.573	1.148	0.371
Range	27.977	10.440	15.200	12.000	16.340	10.000
Minimum	30.175	39.540	29.400	25.000	33.660	25.000
Maximum	58.152	49.980	44.600	37.000	50.000	35.000
Count	21.000	21.000	21.000	21.000	21.000	21.000
Average Developed Countries			43.28%			
Average Developing Countries			33.34%			
Average All Sample Countries			38.31%			

The authors use a long-term event study to assess the impact of CITR changes on the stock market returns, which is selected to be a year. For examination, the periods are divided into two categories, the tax cut periods and tax hike periods. A correlation analysis is conducted for these two categories to find whether tax cuts or tax hikes impact stock market returns. Figure 2 shows the correlation between each country's tax rate change and the change in stock market returns. In Germany, we observe that during the years 1994 and 1999 of tax cuts, there was an increase in stock returns. However, Japan showed contrary behaviour in 1999 and 2004 and similar behaviour in 2000. For the developing countries, Indian stock markets reacted negatively to most tax cuts whereas Brazilian stock markets did not reveal similar behaviour.



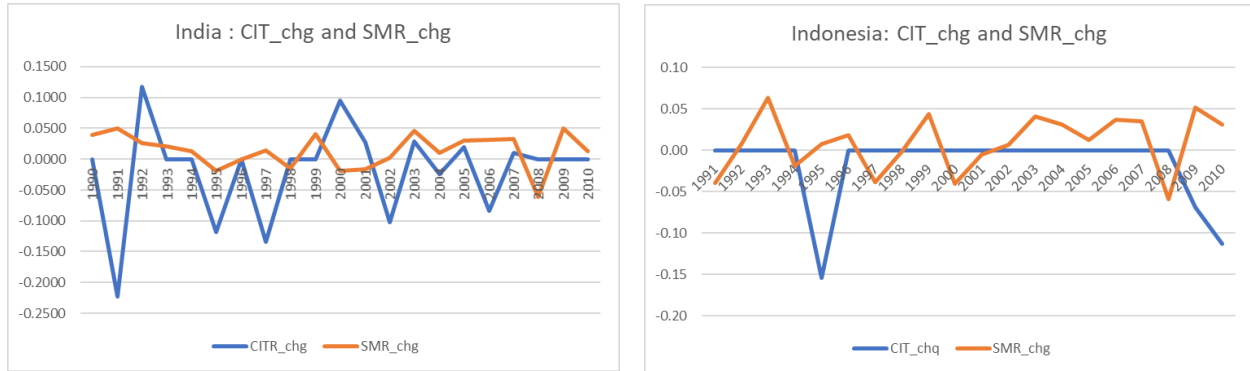


Figure 2: CITR\_chg and SMR\_chg for Developed and Developing Countries

Table 3 shows the correlation coefficients firstly between the two variables of CITR\_chg and SMR\_chg for all sample countries separated into two time periods of tax cuts and tax hikes. There is a positive correlation coefficient of 0.2995 during periods of tax cuts indicating the positive reaction by stock markets to statutory corporate tax cuts. A negative correlation is observed for periods of tax hikes. However, the correlation is relatively insignificant to be able to justify the relation. When data were categorized and analyzed separately for developing and developed economies, the most significant observation is for developed countries where stock markets responded positively to tax cuts with a strong correlation of 0.6874. Contrary to the overall sample for developed countries, the SMR\_chg response to tax hikes was positive and not negative, although very weak, which does not indicate much importance.

Table 3: Correlation Coefficients

Tax Cuts All			Tax Cuts Developing			Tax Cuts Developed		
	CITR chg	SMR chg		CITR chg	SMR chg		CITR chg	SMR chg
CITR chg	1		CITR chg	1		CITR chg	1	
SMR chg	0.299512	1	SMR chg	-0.22019	1	SMR chg	0.68741	1
Tax Hikes All			Tax Hikes Developing			Tax Hikes Developed		
	CITR chg	SMR chg		CITR chg	SMR chg		CITR chg	SMR chg
CITR chg	1		CITR chg	1		CITR chg	1	
SMR chg	-0.09311	1	SMR chg	-0.10183	1	SMR chg	0.134766	1

The regression coefficients were generated for the above mentioned significant correlations and the statistical analysis revealed the major impact on SMR\_chg due to tax cuts for all countries and specifically more vital for developed countries. Overall, we conclude that stock market investors respond positively to tax cuts. This response to tax cuts is much stronger for developed countries as compared to developing countries.

Table 4: Regression Coefficients

(A) Tax Cuts - All Countries				
	Coefficients	Standard Error	t Stat	P-value
Intercept	0.0144547	0.006369051	2.2695192	0.031133261
CITR chg	0.0957173	0.057621836	1.6611286	0.107846049
(B) Tax Hikes - All Countries				
	Coefficients	Standard Error	t Stat	P-value
Intercept	0.013536	0.007501772	1.8043798	0.088918259
CITR chg	-0.066674	0.172922373	-0.385574	0.704594367
(C) Tax cuts - Developing Countries				
	Coefficients	Standard Error	t Stat	P-value
Intercept	0.0143487	0.004816397	2.979142	0.008041786
CITR chg	0.1850594	0.04608467	4.0156399	0.000811081

## Summary and Conclusion

### 1. Summary

This study was conducted with the aim of evaluating the impact of changes in statutory corporate income tax rates on stock market returns. The major finding of the empirical study is that tax cuts motivate stock market returns in general. This positive impact on stock market returns of tax cuts is even more prominent and impactful in developed countries compared to developing countries. For a 1% tax cut in developed countries, the stock markets could expect an increase in returns of 0.185% in the year of the tax change. This impact is lesser when no differentiation is made between economies and for 1% tax cut, stock markets returns expect to increase by 0.096%. This finding confirms some previous studies that have also emphasized a positive impact of tax cuts on capital markets and business performance. (Wang and Macy, 2022, Cummins et al, 1996 and Djankov et al., 2010).

The major limitation of this study is the sample size of six countries. The authors have carefully considered the sample of developed and developing countries to include them from each continent. However, future studies could consist of larger samples to evaluate the same. Furthermore, specific differences in the economic environment of the sample countries were assumed to be fixed during the period considered for analysis.

### 2. Conclusion

The argument put forth by many previous studies that income tax cuts raise economic outcomes and taxes have an adverse impact on people's lives is augmented by this study. One strong finding from this study is that capital markets prefer tax cuts, and it motivates investors is a keen takeaway for corporate managers and governments alike. Especially in developing countries, this impact is found to be more prominent. Governments could structure their tax policies in a way to benefit businesses at the same time protecting their revenue streams. Raising awareness that tax hikes do not reveal any significant outcomes on stock markets contradicts the customary idea of the negative consequences of taxes on businesses. Hence, it would further help governments set up their tax regimes for the overall welfare of the economy.

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