Research of inflation rate and its determinants: An analysis of GSK corporation in United States

meiyi, chen

Universiti uatra malaysia

9 May 2019

Research of inflation rate and its determinants: An analysis of GSK corporation in United States.

Chen Mei Yi
Universiti uatra malaysia

ABSTRACT

With the rapid development of technology and the economy, more and more companies realized that the macroeconomic factors are quite important in terms of the big changes of them might carry the systematic risks to the whole system. For example, the subprime crisis happened in the United States in 2007 and eventually caused the financial crisis to the whole world. Therefore, this paper will choose the GSK corporation as the sample and analyze the inflation risk and the determinants of it. During this paper, the author used the inflation rate as dependent variables and ROA, ROE, corporate governance index, Tobin's Q, Altman-Z score, GDP growth rate and the unemployment rate as the independent variables in order to find the relationship among these variables.

Keywords: Inflation, GDP, Unemployment Rate

1.0 INTORDUCTION

1.1 Introduction

The first chapter includes an overview of GSK's company status and corporate governance research. This chapter discusses in detailed of company profit and background, existing corporate governance, issue statement, the aim of this study research questions, research objectives and also the scope of research.

1.2 Company profit and background

GlaxoSmithKline (GSK) is a British pharmaceutical company headquartered in Brentford, London. Established in 2000 by a merger of Glaxo Wellcome and SmithKline Beecham, GSK was the world's sixth largest pharmaceutical company as of 2015, after Pfizer, Novartis, Merck, Hoffmann-La Roche, and Sanofi.

On July 11, 2013, due to economic crimes such as serious commercial bribery, some senior executives of GlaxoSmithKline (China) Investment Co., Ltd. (referred to as GSK China) were investigated on the basis of law. More than 20 pharmaceutical companies and travel agency staff were investigated by the police, including four senior executives of GlaxoSmithKline China. After investigation, the public security department found that GlaxoSmithKline China used brigade and other channels to pay bribes to government officials, pharmaceutical industry associations, foundations, hospitals, doctors, etc. for the purpose of opening up drug sales channels and increasing drug prices. Therefore, the GlaxoSmithKline Chinese executives involved in the case were suspected of occupational crimes, non-state staff bribery, and other economic crimes. Moreover, the relevant staff of the travel agency were suspected of bribery and assisted the above-mentioned executives in their occupation. The Chinese police also said that as of July 14, 2013, at least four travel agencies, including Shanghai Linjiang International Travel Service Co., Ltd., was involved in the case, and some government officials and hospitals were also involved.

1.3 Existing Corporate Governance

From the corporate governance of risk in 2011, under the Audit and Risk Committee overseeing risk management and internal control activities, GSK invested a lot of time and resources in risk assessment and monitoring. And in the direction of risk control, corporate responsibility, economic and financial, etc. have made relevant governance directions and policies. In the year of the scandal (2013), the company released new governance and compensation.

Report changes According to the new regulations of the Ministry of Finance, the Reporting Committee's updated corporate governance guidelines for the UK (updated code), as well as the new start of our compensation reporting rules, review our governance and corporate reporting arrangements. And compared to the restructuring annual report last year. The corporate governance report, in addition to consolidating the information portion of several statutory disclosure shareholders' annual reports, risk disclosure will also be included in the risk management component.

1.4 Issue Statement

Earlier media reports said that GlaxoSmithKline's internal and internal reports had led to cases of bribery and bribery by executives, but the Chinese police denied it. However, the Chinese police reported that at the beginning of 2013, some travel agencies were found to be operating abnormally during their work. Moreover, the police investigators said that Shanghai Linjiang International Travel Service has never done any tourism business, but its annual turnover has soared from several million yuan at the beginning of its establishment to several hundred million yuan before the incident. Therefore, with the assistance of the relevant departments, the police who deployed the case involved conducted an investigation and found that GlaxoSmithKline China and its affiliates were suspected of major economic crimes.

Finally, after obtaining the solid evidence, the Ministry of Public Security instructed public security organs in Changsha, Shanghai, Zhengzhou, Henan and other places to

file investigations. On June 27th and July 10th, two centralized arrests were organized. Criminal compulsory measures were taken against some Glasgow China executives and some travel agency staff.

1.5 The cases relationship with corporate governance

After the whole incident, we saw that GlaxoSmithKline China apparently did not fulfill its corresponding responsibilities and obligations. Conduct economic activities in China through illegal means, such as bribery. In recent years, bribery in China has been repeatedly banned, which not only caused great damage to the company's image but also had a major negative impact on the company's subsequent development. In the economy, GlaxoSmithKline's Chinese bribery incident allowed GSK to publicly acknowledge the direct loss of the incident to China's performance for the first time. In the 2013 third quarterly report released, the company's current revenue increased by 1% year-on-year, and net profit decreased by 12%. Among them, GSK China fell 61% in terms of sales of its core pharmaceutical products and vaccines. Undoubtedly brought great changes to the company's economic development. And society, In various reports, the Chinese people are also very touched by the bribery incident of GSK, and many people have chosen other companies of the same kind. He also expressed the hope that the Chinese government will strictly abide by the principal responsible for this bribery incident.

1.6 The purpose of this study

This study aims to investigate the inflation and its determinants and also their impacts to the corporation.

1.6.1 Research questions

1. What is the relationship between the inflation rate and firm-specific factors.

2. What is the relationship between the inflation rate and macroeconomic factors.

3. What is the relationship between the inflation rate and both firm-specific factors and macroeconomic factors?

1. Investigate the relationship between inflation rate and firm-specific factors.

2. Investigate the relationship between inflation rate and macroeconomic factors.

3. Investigate the relationship between the inflation rate and both firm-specific factors and macroeconomic factors.

1.7 Scope of the Study

This paper chooses the financial data which are ROA, ROE, Altman Z-Score, Tobin-Q and corporate governance index of GSK Corporation between the year 2011 and the year 2015 and all of them are calculated based on the annual report. Meanwhile, this study also uses macroeconomic factors consist of GDP growth rate, unemployment rate and the foreign exchange rate of the United States from the year 2011 and the year 2015.

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter will do the literature review based on the dependent variable which is the inflation rate and its determinants which are GDP and unemployment rate.

2.2 Inflation rate and GDP

In economics, inflation represents a sustained increase in the overall price level of goods and services over a period of time in the economy. Gross domestic product (GDP) is a measure of the value of all end products and the market value of services generated over time. Inflation and Growth: An Estimate of the, published by scholar Yasir Ali Mubarik in 2015. In the Threshold Level of Inflation in Pakistan , we are getting a boost to economic growth when inflation is below 9% of the estimate. *(Yasir Ali Mubarik, 2015).*And according to the literature confirmed by *Michael Sarel (1996)*, it was found that inflation had a negative impact on economic growth. Later, *Gokal, V., & Hanif, S. (2004). Relationship between inflation and economic growth. Economics Department, Reserve Bank of Fiji*. The economic structure and the factors affecting inflation, the correlation between the two variables is not Strong, and the link between these two variables is not very surprising. The correlation coefficient shows only a weak negative relationship, and the causal relationship shows economic growth to inflation.

2.3 Inflation rate and unemployment rate

According to the theoretical and empirical literature, from the scholars *Dr. Aurangzeb's July 2013* issue of Factors Affecting Unemployment: *A Cross Country Analysis*, we got Inflation does not Granger Cause *(Dr. Aurangzeb, Jan 2013).* But in contrast, *N. Gregory Mankiw 2000,* published in the paper, gives an uncertain explanation and puts forward two points. The first is that in economics, most people think that inflation has a certain impact on the unemployment trade-off. Second, from a theoretical point of view, the so-called "New Keynes Phillips Curve", in fact, does not meet the standard stylized facts about the dynamic effects of monetary policy.

3.0 RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this chapter is to give the reader an understanding of the methods and related research methods used in our research. We outline population and sample studies, research hypotheses, data collection procedures, and statistical analysis procedures. Research methods are specific processes or techniques for identifying, selecting, processing and analyzing information about a topic. The method used to collect and analyze data is the statistical version of the IBM Social Science Statistics Software (SPSS).

3.2 Population / Sampling Technique

Both the population and sample of this study is the annual report of GlaxoSmithKline. Moreover, the researcher collected the company's financial data which are corporate governance index, ROA, ROE, Tobin's Q, Altman Z and also GDP growth rate, unemployment rate and the inflation rate of United States between the year 2011 and 2015.

3.3 statistical techniques

The aim of this study is investigating the relationship between ROE and other variables that this paper chose. Some data for this company were selected, corporate governance index, ROA, ROE, Tobin's Q, Altman Z, GDP growth rate, unemployment rate and inflation rate. The data used for this study was taken from the annual report of GSK Corporation for the five years from 2011 to 2015. The income statement contains a statement of profit and loss and a balance sheet for the financial information used to evaluate the company's financial performance. Financial data is calculated financial ratios consist of return on assets, return on equity, Tobin's Q, Altman Z and corporate governance index.

3.4 Research hypothesis

The hypothesis is that researchers predict the relationship between two or more variables, but it involves more than just one respondent. Most of the time, the assumption begins with a question and then explores through background research. Only at this point did the researchers begin to study a testable hypothesis. The research objectives and research hypotheses are listed below.

<u>Research hypothesis</u>

1. There is a relationship between the inflation rate and firm-specific factors.

2. There is a relationship between the inflation rate and macroeconomic factors.

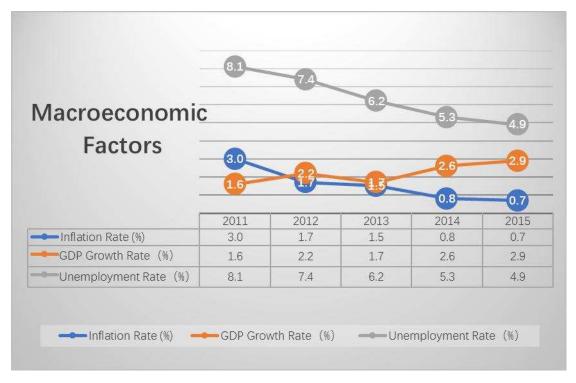3. There is a relationship between the inflation rate and both firm-specific factors and macroeconomic factors.

4.0 Finding and Analysis

4.1 Introduction

The researcher analyzed the annual financial statements of GSK. This paper also reviewed and evaluated the data in the company's annual report and calculates and judges the data. In this study, the relationship between GSK's Altman Z, Tobin Q and the macroeconomic and corporate governance index will be measured and compared over a five-year period (2011-2015).

4.2 Market Risks

Market risk can be defined as systematic risk. This paper chooses the GDP growth rate, unemployment rate and inflation rate as the considered factors for analyzing market risk.

	2011	2012	2013	2014	2015
Inflation Rate (%)	3.0	1.7	1.5	0.8	0.7
GDP Growth Rate（%）	1.6	2.2	1.7	2.6	2.9
Unemployment Rate（%）	8.1	7.4	6.2	5.3	4.9

Economic factors in United States from 2011 to 2015.

Based on the chart above, it is clear that the GDP growth rate in the United States is not extremely volatile but it still has some slight differences. Between the year 2011

and year 2012, GDP is slightly increased from 1.60% to 2.20% while in year 2013, it has a slight decrease to 1.7%. After that, it was re-increase gradually to 2.9% at the end of year 2015. That means from year 2011 to year 2012, the entire economy of United States was performing well while in year 2013, the economy of America was gradually becoming worse and the reason might be the amount of production was decreased at that time period based on the lack of consumers demand. While after 2013, GDP increased. It might because of the demand of consumer increased.

The unemployment rate in United States was keeping declining trend between year 2011 and 2015 from 8.1% to 4.9%. That refers to the force in labor market was decreasing between this five years period, more and more people can find jobs in US. Or in other words, the entire economic environment of United States can be defined as performing well gradually. The reason might is the increasing trend of GDP, higher GDP means higher production of the country which can let more people be employed, therefore, the unemployment rate can decrease.

Furthermore, the rest factor is the inflation rate. The inflation rate in United States indicated the declining trend from year 2011 to 2015. The figure was 3.0% in 2011 and decreased to 0.7% during the last year. Lower inflation will increase the growth of the economic and increase purchasing power as well. Therefore, if the inflation rate is low, the company is more stable for operating, because it is more easily to predict and analyze the future cost so that it can encourage the investment.

4.3 Descriptive Statistics

	Mean	Std. Deviation	N
Inflation	1.5400	.92358	5
Corporate Governace Index	.7540	.00548	5
ROA	.1056	.04963	5
ROE	.7852	.48208	5
TOBINSQ	.1552	.04973	5
ALTMENZ	1.4548	.50248	5
GDP	2.2000	.56125	5
Unemployment	6.3800	1.35904	5

Based on the descriptive statistics table above, it refers to the mean value of inflation rate between year 2011 and year 2015 is 1.5400. Meanwhile, the standard deviation of inflation rate during this five years period is 0.9236 which means the figure of this variable is stable in terms of the low standard deviation.

4.4 Correlation

Correlations

		inflation	Corporate Governance Index	ROA	ROE	TOBINSQ	ALTMENZ	GDP	unemployment
Pearson Correlation	Inflation	1.000	.306	.125	-.339	-.141	.570	-.839	.941
	Corporate Governance Index	.306	1.000	.412	.495	-.609	.737	.081	.081
	ROA	.125	.412	1.000	.820	.243	.824	-.219	.037
	ROE	-.339	.495	.820	1.000	-.064	.563	.375	-.406
	TOBINSQ	-.141	-.609	.243	-.064	1.000	-.116	-.419	-.150
	ALTMENZ	.570	.737	.824	.563	-.116	1.000	-.430	.407
	GDP	-.839	.081	-.219	.375	-.419	-.430	1.000	-.790
	Unemployment	.941	.081	.037	-.406	-.150	.407	-.790	1.000
Sig. (1-tailed)	Inflation	.	.308	.420	.288	.411	.158	.038	.009
	Corporate Governance Index	.308	.	.245	.198	.138	.078	.448	.449
	ROA	.420	.245	.	.045	.347	.043	.362	.477
	ROE	.288	.198	.045	.	.460	.162	.267	.249
	TOBINSQ	.411	.138	.347	.460	.	.427	.241	.405
	ALTMENZ	.158	.078	.043	.162	.427	.	.235	.248
	GDP	.038**	.448	.362	.267	.241	.235	.	.056
	Unemployment	.009**	.449	.477	.249	.405	.248	.056	.
N	Inflation	5	5	5	5	5	5	5	5
	Corporate Governance Index	5	5	5	5	5	5	5	5
	ROA	5	5	5	5	5	5	5	5
	ROE	5	5	5	5	5	5	5	5

TOBINSQ	5	5	5	5	5	5	5	5
ALTMENZ	5	5	5	5	5	5	5	5
GDP	5	5	5	5	5	5	5	5
Unemployment	5	5	5	5	5	5	5	5

Note: $* p < 0.10$，$** p < 0.05$, $***p < 0.001$. ROA is return = net income / total assets, ROE = net income / shareholder's equity, Tobin's Q = total market value of firm / total assets value of firm, Altmen-Z score = $6.56*T1 + 3.26*T2 + 6.72*T3 + 1.05*T4$ （T1 = (current assets – current liabilities) / total assets, T2 = retained earnings / total assets, T3 = earnings before interests and taxes / total assets, T4 = book value of equity / total liabilities ） GDP, unemployment and inflation is chosen between year 2011 to 2015.

Pearson correlation chart is used to analyze the relationship between the dependent variable which is inflation rate and independent variables which are both bank-specific factors and macroeconomic factors.

Based on the correlation table above, it is clear that GDP growth rate is negatively significantly correlated to inflation rate with the p-value is equal to 0.038 and the number of Pearson correlation is -0.839. This indicates that when the GDP growth rate decreased, inflation will increase. The reason of this is GDP indicates that the market value of all the final products produced in the economic activities of a region in a given period of time, it is also the core index of national economic accounting. It is also very important to measure the economic status and development level of a country or region. Therefore, when GDP decreases, it will cause the declined growth of economic and decrease the purchasing power as well.

Moreover, it also shows that the unemployment rate is positively significantly correlated with the inflation rate. The number of Pearson correlation is 0.941 and the p-value is equal to 0.009. It refers to when the unemployment rate increase, inflation rate will also increase. The reason can be defined as when unemployment rate increase, fewer people can be employed, more and more people will get fired due to the economic factors, in other words, the entire economy of that country is performing worse. Therefore, the goods price will increase, the consumer purchasing power will decrease, the value of the currency will depreciate and eventually cause the inflation increase.

4.5 Coefficient

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-2.539	.863		-2.942	.060	-5.286	.207		
	unemployment	.639	.133	.941	4.812	.017	.217	1.062	1.000	1.000

a. Dependent Variable: inflation

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		Minimum Tolerance
						Tolerance	VIF	
1	CorporateGovernaceIndex	.232[b]	1.322	.317	.683	.994	1.007	.994
	ROA	.091[b]	.395	.731	.269	.999	1.001	.999
	ROE	.052[b]	.200	.860	.140	.835	1.198	.835
	TOBINSQ	.000[b]	.000	1.000	.000	.978	1.023	.978
	ALTMENZ	.224[b]	1.070	.396	.604	.834	1.199	.834
	GDP	-.255[b]	-.737	.538	-.462	.376	2.659	.376

a. Dependent Variable: inflation

b. Predictors in the Model: (Constant), unemployment

Based on the table of coefficients, the independent variables that have a significant influence on inflation rate can be determined through the significant level which is the amount of t-value. The higher t-value, the variable can be determined as the more significantly influenced the dependent variable. Meanwhile, the value of beta shows the relationship between dependent variable and independent variables is positive or negative, if the beta is positive figure, then the relationship is positive while if the value of beta is negative, then the relationship is negative.

This analysis used stepwise as the method, and it shows that unemployment rate is positively and mostly significant toward inflation rate with t-value is 4.812 which is the highest figure among these variables and beta is equal to 0.941. It indicates that when unemployment increase, the inflation rate will increase, which refers to the entire economic environment is worse.

4.6 Model Summary and ANOVA table

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.941[a]	.885	.847	.36120	2.780

a. Predictors: (Constant), unemployment

b. Dependent Variable: inflation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.021	1	3.021	23.152	.017[b]
	Residual	.391	3	.130		
	Total	3.412	4			

a. Dependent Variable: inflation

b. Predictors: (Constant), unemployment

Based on the model summary table above, it is clear that the adjusted R square is equal to 84.7% around 85%. It indicates that unemployment rate here can explain 84.7% of the variances in the inflation rate of United States. However, it still has 15.3% of the adjusted R Square remain unknown. That means the remaining of 15.3%

of the adjusted R Square indicates that the variance in the inflation rate of United States is unable to be explained by   both bank-specific factors and macroeconomic factors in Model 3. Moreover, the ANOVA table above shows the significant value is 0.017 which is below than 0.05. That means the variable is truly significant to represent the model.

5.0 Conclusion and Recommendation

5.1 Introduction

This study aims to analyze the inflation risks faced by GSK corporation and its determinants. To achieve this objective, this study selects firm-specific factors which are ROA, ROE, corporate governance index, Tobin's Q and Altman-Z score and macroeconomic factors which are GDP growth rate and unemployment rate for using and analyzing.

5.2 Discussion of result

This study aims to determine the inflation risk of GSK corporation and its determinants. The objectives of this study is *To investigate the bank-specific factors and macroeconomic factors towards inflation risk.*

Based on the correlation table and coefficient table, it can be concluded as inflation ratio has been influenced and affected by macroeconomic factors in terms of GDP growth rate and unemployment rate. The Correlation table indicates that GDP growth rate is negatively and significantly correlated to inflation rate with p-value is 0.038 while unemployment rate is positively correlated with inflation rate and the p-value of it is 0.009. During coefficient table, it is clear that unemployment rate is the mostly influenced inflation rate variable in terms of the highest t-value.

Overall the whole study, the model summary table shows that 84.7% of the model is explained by the variable which is unemployment rate from both bank-specific factors and macroeconomic factors. ANOVA table indicates that the significant value is 0.017 and that refers to the model is reliable and acceptable. Therefore, based on the whole data, it can be concluded that macroeconomic factors have more effects rather than firm-specific factors in influencing the inflation rate and inflation risks faced by GSK corporation.

5.3 Limitations

This study has some limitations as well. First of all, this study only chooses one company that GSK corporation as the sample to analyze. Secondly, this study only takes data between five-year-period from 2011 to 2015. Thirdly, this study only selects total of 8 variables to analyze. Therefore, the information of this study is still limited.

5.4 Recommendations

During this study, it is clear that unemployment and GDP growth rate are the most two significant variables with inflation rate and the inflation risk. Thus, it is important for GSK corporation making the correct financial decisions when GDP and unemployment rate has changed.

6.0 References

GlaxoSmithkline(15 feb,2019) Wikipedia, the free encyclopedia

Baidu,*GlaxoSmithKline China Bribery*（07,2013）

Agrawal, A., & Chadha, S. (2005). Corporate governance and accounting scandals. *The Journal of Law and Economics*, *48*(2), 371-406.

Lajili, K., & Zéghal, D. (2010). Corporate governance and bankruptcy filing decisions. *Journal of General Management*, *35*(4), 3-26.

Bhagat, S., & Bolton, B. (2008). Corporate governance and firm performance. *Journal of corporate finance*, *14*(3), 257-273.

Dignam, A., & Galanis, M. (2008). Corporate governance and the importance of macroeconomic context. *Oxford Journal of Legal Studies*, *28*(2), 201-243.

Smirlock, M., Gilligan, T., & Marshall, W. (1984). Tobin's q and the Structure-Performance Relationship. *The American Economic Review*, *74*(5), 1051-1060.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and psychological measurement*, *20*(1), 37-46.

Oja, H. (1983). Descriptive statistics for multivariate distributions. *Statistics & Probability Letters*, *1*(6), 327-332.

Weiss, N. A., & Hassett, M. J. (1999). *Introductory statistics*. Boston: Addison-Wesley.

Wigginton, J. E., & Abecasis, G. R. (2005). PEDSTATS: descriptive statistics, graphics and quality assessment for gene mapping data. *Bioinformatics*, *21*(16), 3445-3447.

Sims, C. A. (1980). Macroeconomics and reality. *Econometrica: journal of the Econometric Society*, 1-48.

Rode, S. (2012). *Advanced macroeconomics*. Bookboon.

BLANCHARD, O. A., Blanchard, O. J., & Fischer, S. (1989). *Lectures on macroeconomics*. MIT press.

Chung, K. H., & Pruitt, S. W. (1994). A simple approximation of Tobin's q. *Financial management*, 70-74.

Wernerfelt, B., & Montgomery, C. A. (1988). Tobin's q and the importance of focus in firm performance. *The American Economic Review*, 246-250.

Altman, E. I. (2000). Predicting financial distress of companies: revisiting the Z-score and ZETA models. *Stern School of Business, New York University*, 9-12

Calandro Jr, J. (2007). Considering the utility of Altman's Z-score as a strategic assessment and performance management tool. *Strategy & Leadership*, *35*(5), 37-43.

ADAM, H. (2019). How the Q Ratio (Tobin's Q Ratio) Works. Retrieved from

Bhagat, S., & Bolton, B. (2008). Corporate governance and firm performance. Journal of corporate finance, 14(3), 257-273.

Bradsher, H. (2010). Prius Brake Inquiry May Be Another Blow for Toyota. Retrieved

Billich, A. (2003). S-1360 Shionogi-GlaxoSmithKline. *Current opinion in investigational drugs (London, England: 2000)*, *4*(2), 206-209.

Garçon, N., Chomez, P., & Van Mechelen, M. (2007). GlaxoSmithKline Adjuvant Systems in vaccines: concepts, achievements and perspectives. *Expert review of vaccines*, *6*(5), 723-739.

Nisen, P., & Rockhold, F. (2013). Access to patient-level data from GlaxoSmithKline clinical trials. *New England Journal of Medicine*, *369*(5), 475-478.

Crabb, C. (2006). GlaxoSmithKline ends aplaviroc trials. *Aids*, *20*(5), 641.

Evangelista, S. (2005). Talnetant GlaxoSmithKline. *Current opinion in investigational drugs (London, England: 2000)*, *6*(7), 717-721.

Gibson, L. (2004). GlaxoSmithKline to publish clinical trials after US lawsuit. *BMJ: British Medical Journal*, *328*(7455), 1513.