

A Critical Review on Interest Rate as A Tool of Monetary Policy

Diyah Putriani ^a

Prastowo ^b

^a Lecturer (on leave) at FEB UGM and PhD Student at IIU Malaysia. Email: diyah.putriani@gmail.com
^b Lecturer at Faculty of Economics, Universitas Islam Indonesia (FE UII). Email: prastowo85@gmail.com

Abstract

Objectives: This research is aimed to critically review the relationship between interest rate and economic downturn

Methods: Meta-analysis.

Results: The existing monetary policy will always create higher inflation rate overtime triggering economic crisis in the long run. This is not merely about how the monetary authority strictly manages the supply and demand for money in the economy.

Conclusion: This paper concludes that interest rate give negative contribution to the economic growth.

Keywords: interest rate, economic downturn, monetary policy, meta-analysis

Abstrak

Tujuan: Penelitian ini dimaksudkan untuk mengkritisi hubungan antara tingkat bunga dan penurunan ekonomi.

Metode: *Meta-analysis*.

Hasil: Kebijakan moneter yang sekarang berlaku akan selalu menciptakan tingkat inflasi lebih tinggi dan memicu krisis ekonomi dalam jangka panjang.

Kesimpulan: Penelitian ini menyimpulkan bahwa suku bunga berkontribusi secara negative terhadap pertumbuhan ekonomi.

Kata kunci: suku bunga, penurunan perekonomian, kebijakan moneter dan *meta-analysis*.

1. Introduction

Monetary policy refers to the government policy which relates to supply of money in the economy for the purpose to promote economic stability and growth (Mankiw, 2013). Many research papers give highly attention on monetary policy due to its significant effects to the whole social life of economic, e.g. aggregate demand as well as real gross domestic product (GDP), level of unemployment rate, exchange rates, investment, and etc. The instability on monetary sector, in the other words, will also destabilize the macroeconomic which triggers business cycle. This implies that monetary sector which rules the creation of money plays vital role in the economy.

Regarding the issues of monetary policy, a big debate among different schools of thought can be addressed into two points, i.e., (1) how to explain economic instability (business cycle) phenomenon and (2) how to maintain its (monetary) stability in order to achieve high economic growth.

Neoclassical economics believes that real variable shock is the culprit of this instability; meanwhile Keynesian economics argue that low aggregate demand responsible for it. In 1936, the advocates of Keynes proposes IS-LM graph to explain that interest rate will equate the supply and demand both from two sectors, i.e. goods and services market (real sector) and money market (monetary sector). In other words, interest rate becomes a powerful monetary tool to maintain economic stabilization.

Oppositely, heterodox economics represented by Austrian school heavily criticizes Keynes's thought. They propose a theory so-called Austrian business cycle (ABC) to explain the monetary instability. They argue that the (low) interest rate policy in banking industry must responsible for this undesired condition. At this point, an essential question arises; how about Islam economics school views on the role of interest rate as a monetary policy tool in order to promote economic growth and stability? The issue of interest rate is important, especially in Islamic economics. This is due to the very objective of sharia (maqasid al-sharia) will never be

reached if interest rate is the base of the economic system (Meera and Larbani, 2004). Dusuki and Abozaid (2007) state that maqasid al-sharia represents the whole picture of Islam. According to Al-Ghazali, there are 5 elements of maqasid al-shari'ah that must be safeguarded, i.e. life (sovereignty), faith, intellect, posterity, and wealth. Technically speaking, when policy of an indebted country is driven by the creditor country, thus the decision will not consider the domestic people's aspirations. In other words, the sovereignty of the indebted country is owned by the lender. Thus, the policy prescribed for the people of an indebted country is basically created by the lender country's wants.

As of Chapra (1996) also argues that all major religions- including Hinduism, Judaism, Christianity and Islam- have strictly prohibited interest, which indirectly implies to a question that the application of interest rate as a main tool for stabilization may perhaps be one of the major reasons for this destabilization. Considering these different views, this paper is proposed to critically review the relationship between interest rate and economic downturn by applying meta-analysis procedures.

2. Research Objective and Methodology

2.1 Objective and Paper Contributions

This paper is designed to critically review the relationship between interest rate and economic fluctuation from an Islamic point of view. Most similar previous studies on this issue are dominated by econometrical analysis; however, there are only small numbers of articles that discuss about Islamic monetary policy. In addition, the author discovers that there is no research conducted observing monetary policy from an Islamic perspective investigated by using meta-analysis. Therefore, this article review will contribute to the literature's study of monetary policy from Islamic economics.

This paper is divided into 4 parts as follows. Part 1 explores the background of the research; part 2 discusses the research method and the data; and part 3 analyzes critically the current monetary

policy from Islamic perspective. Some conclusions and policy implications are presented in part 4.

2.2 Methodology

Given the objectives of this research, data requirements and the availability of time and resources, this study will employ meta-analysis procedures as methodology. Meta-analysis was firstly developed in 1970s by Glass (1976) in the study area of psychology. Field and Gillet (2010) examine meta-analysis as a statistical tool for estimating the mean and variance of some empirical previous study which has same research question. It is utilized to analyze the proposed hypotheses quantitatively, i.e. to combine the estimation of independent studies. By statistically combining the similar estimations, the research paper may precisely improve the precision and quality analysis of article review.

To do so, the data are gathered from the estimated data from multiple previous independent studies and extracts its size (Zang, Fu, Cai, and Lu, 2014). Cohen (1988) defines effect size as “*the degree to which the phenomenon is present in the population or the degree to which the null hypothesis is false...the larger the value of effect size, the greater the degree to which the phenomenon under study is manifested*” (p. 9-10). The effect sizes will then be standardized and subjected to null-hypothesis testing to determine the strength of the relationships which is formulized, as follows (Cooper, 2009):

$$r = \sqrt{\frac{t^2}{t^2 + df_{error}}} \quad (1)$$

Where,

t = the value of the t-test for the associated comparison

df_{error} = the degrees of freedom associated with the error term of the best t-test

The use of *r-index* is the most appropriate metric for expressing an effect size when the researcher is interested in describing the relationship between two continuous variables. Afterwards, the total *effect size* is calculated by finding the average weighted *r-index*; that is transformed to its corresponding z-score, z_i , as follows:

$$z. = \frac{\sum_{i=1}^k (n_i - 3) z_i}{\sum_{i=1}^k (n_i - 3)} \quad (2)$$

Where,

n_i = the total sample size for the *i*th comparison

The formula to obtain a confidence interval for the average z-score, as follows:

$$Cl_{z95\%} = z. \pm \frac{1.96}{\sqrt{\sum_{i=1}^k (n_i - 3)}} \quad (3)$$

3. Critical Review

3.1. Qualitative Survey of The Role of Interest Rate in the Economy

There are several channels how interest rate influence the economy which can be traced from the macroeconomic variable; such as inflation, unemployment and GDP growth. Many scholars have investigated this relationship empirically. Rehman and Ghaffari (2012) apply both Granger causality and Empirical Bayes to investigate the effectiveness of interest rate as a policy variable to fight inflation. The finding shows that the interest rate is a useless policy tool which has no power to reduce inflation. He also suggests that central bank should never use high interest rate to against inflation; indeed the existence of interest rate must be eliminated from the system.

In fact, the prevailing financial system is, indeed, to promote the spirit of *zero sum game*. As exemplified by Meera and Larbani (2009), the international debt purposing to improve the people' wellbeing will never be paid back in aggregate. They illustrate the total amount of money supply in the global economy, says US\$ 15,000 billion, lent to

some low-income countries which plus 10 percent (per year) of interest rate. After the due date, the indebted countries should pay US\$ 16,500 billion; however the total existing money is only US\$ 15,000 billion. If the extra money US\$ 1,500 is not printed to be injected in the system, thus (some) borrower countries will be trapped into debt crisis. That is to say, unlucky default countries are always born.

In the other side, there are several channels how interest rate influence the rate of unemployment. First, the increasing of interest rate will push the cost of production into higher level causing number of investments go down. In some cases this declining encourages some closure of the business unit affecting the number of retrenchment of employed workers rise. Second, to cover the increasing in production cost, the producer will increase the price of produced goods and services causing the rate of inflation go up (Aliero, 1992). Empirically, Basu et.al., (2001) show that in the U.S. there is a positively relationship between unemployment rate and interest rate risk by using GARCH model. Similarly, Dogrul and Soytaş (2010) forecast by applying Toda-Yamamoto procedures, they find that in the long run the rise of interest rate will cause the number of unemployment rise in Turkey.

Even so, in some countries there is a possibility of negative relationship between interest rate and unemployment. When the interest rate falls down, hence the number of unemployed people will rise up, vice versa. The rationale reason behind this phenomenon can be explained by *Phillips curve* theory proposed by A.W. Phillips in 1958. He reported evidence of an inverse relationship between the rate of increase in wages and the rate of unemployment. By comparing rates of rise in wages with the rate of unemployment rates in Britain spans from 1861 to 1957, he found that as the labor market tightened, and the unemployment rate fell, money wages tended to rise more

rapidly. Because wage increases are closely correlated with price increases, thus this relationship was widely interpreted as a trade-off between inflation and unemployment (Cashel, 2004).

The follower of Austrian economics even more specifically addresses that credit expansion -induced by low interest rate- contributes significantly negative to the economy (GDP) in the long run, both for developed and developing countries. Islam, for sure, highly pays attention to the matter of credit as hadith narrated by ‘Usama ibn Zaid *radhiyallahu’an* that the Prophet *shallallahu `alaihi wa sallam* as having said “*Beware; there can be an element of interest in credit*”. In today world, this hadith has empirically proven in the works of Anker (2011), Bjerkenes, *et.al* (2010), Helmensson and Selleby (2009) and many others. To be precise, when the monetary authority decides to expand the economy by lowering the short term interest rate, the investors (or entrepreneurs) then think that this low rate is a good indicator to exercise their project. They then propose a bank to borrow more money in order to be invested, particularly in physical capital. In the long run, the volume of money supply in the economy rises up causing prices to go up. The entrepreneurs who invest in the project find that the price of goods and services are going up, causing producer price compared to consumer price increases. This condition then pushes the cost of production to rise. To maintain the stability of the profit, producers may raise the price of their products or reduce their volume of production, causing GDP to go down. People naturally will reject this decision by reducing their volume consumption. Eventually, the earned profit falls and the whole investment goes down into the first stage of production, extending the process of production. The production structure becomes more roundabout as a result. This may

serve as the reason why the relationship between low interest rate (as well as price) and GDP is negative.

By following Austrian economists' thought, it is also found that the interest rate contributes negatively to GDP of developed countries due such as Canada, Japan and United Kingdom (UK). The estimated coefficient regressions result verify that the interest rate has significantly negative relationship to the economy (Gross Domestic Product, GDP), i.e.; the increasing of 1 percent interest rate is likely to decrease GDP by about 0.358 percent (Canada), 0.25 percent (Japan), and 0.075 percent (UK) (Putriani, 2013).

The introduction of money through interest-based banking system must take strict control; otherwise high inflation will arise. In essence, a rise in the volume of money supply in current system is triggered by the application of interest rate as price of money in the form of debt or credit from the banking industry as well as capital market. Either central banking or banking industry may produce money in today economy system.

3.2. A Synthesis of the Role of Interest Rate in the Economy

“If adulteries and usury have been done explicitly in a country, then the people of that country have invited upon themselves the punishment of Allah.”¹

In regards with above hadith, many empirical researches find the harm effect of interest rates as major monetary policy instrument. Economic difficulties, or even macroeconomic turbulence, may become one of His punishments to disobedience people at large. Every economic crisis, indeed, will always bring misery to the whole society (Sherman, 1991). This sub-chapter synthesizes this matter from quantitative perspectives by applying meta-analysis

¹ Sahih al-Jami', no. 679

Table 1 Result of Meta-Analysis²

No. of observations	: 19
Weighted average Zi	: 0.476
CI _{95%}	: 0.520 ± 0.432
Conclusion	: There is negative relationship between interest rate and GDP
Author's calculation	

There were about 100 articles has been observed; however, only 19 results of independent studies which can be proceeded. This due to meta-analysis needs to collect each of estimated coefficients from independent studies which employ same methodology. Focus of observation was on the coefficient of the long run relationship between interest rate and economy. Table (4.1) summarizes the result of weighted average Z used to calculate average *total effect size*. The average Zi was 0.476 with 95% confidence interval ranging from 0.432 to 0.520. Thus, this result rejects the null hypothesis that there is no negative relation between interest rate and economy. In other words, this finding empirically supports the above hadith and the argument of advocate of ABC theory and Islamic perspective as well as previous studies that interest rate contributes negatively to the economy, indeed.

4. Conclusion

The existing monetary policy will always create economic crisis, though the supply and demand of money is strictly managed. It will, however, never preserve the objective of Islam, i.e. *maqasid al-shari'ah*. Keynesian school divides 3 functions of money, i.e. medium of exchange, precautionary, and speculation. It is noteworthy to highlight, if money is proposed to be a mean of speculation, it implies that money should have price. This may be the reason why Keynes put interest rate as price of money which becomes

² Detail calculation (see: Appendix)

the fundamental theory of time value of money. And, this Keynes's system is unfortunately prevailed today. Since the philosophical underpinning of current system is capitalist system, thus it will only serve the interest of capitalists, not Muslims.

An increase of inflation rate overtime, as one of characteristic in economic downturn, is essentially fueled by the system of interest rate. Inflation, as generally known, is caused by an increase of money supply exceeding the growth of real output. Technically speaking, when money supply is increased, people generally have more to produce for goods or services. However, if the real economic does not develop –the same volume of production– as much as the increasing in the supply of money, in consequence, the price of goods and services goes up. It then generates a diminishing in purchasing power parity. At this point, the rise of price such products does not because these products are scarcer than before, but it caused by the abundant of dollar in the economy. In short, the current definition of inflation, however, has an implicit meaning.

Having reviewed and synthesized related articles by applying meta-analysis procedures, this paper has qualitatively and empirically showed that interest rate harms the economy. Whatsoever the monetary authority hardly set the rate of inflation as well as strictly manages the money supply, in the end of the day the prevailing interest-rate based system will definitely situate the economy plunges towards decline and destruction. In short, either the previous or the next economic crisis is intentionally to be created (to serve the interest of capitalist) by the prevailing system.

References

- Agalega, Evans and Antwi, Samuel. (2013). The Impact of Macroeconomic Variables on Gross Domestic Product: Empirical Evidence from Ghana. *International Business Research*; Vol. 6, No. 5; 2013
- Aliero, Hussaini Ibrahim. (1992). "Prohibition of Interest in An Islamic Economy: Rationale and Some Consequences". Master Thesis. Unpublished. IIUM
- Anker, Rasmus. (2011). "ABC Theory: Evidence from Scandinavia". Master Thesis. Aarhus School of Business.
- Basu, Parantap; Ghoshb, Satyajit; and Kallianiotisb, Ioannis. (2001). "Interest risk, labour supply and unemployment". *Economic Modelling 18 2001. pp. 222-231*
- Bjerkenes, Håkon; Kiil, Håkon and Anker-Nilssen, Paal. (2010). "Austrian Economics: Application on Norwegian Business Cycles". Master Thesis in Financial Economics. The Norwegian School of Economics and Business Administration.
- Cashel, Brian. W. (2012). "Inflation and Unemployment: What is the Connection?" Congressional Research Service. Accessed on October 22nd 2012. Available on: http://digitalcommons.ilr.cornell.edu/key_workplace/180
- Cashell, Brian. W. (2009). "What is A Recession, Who Decides When It Starts, and When do They Decide?" In Selected Essay. Editor: Perez, Nerea. M. and Ortega, June. A. 2009. *Recessions: Prospects and Development*. Nova Science Publisher. Inc.: New York.
- Chapra, Muhammad Umer. (1996). "Monetary Management in an Islamic Economy" *Islamic Economic Studies* (IRTI, Jeddah), December, 1996, pp. 1-34. Accessed on May, 5th 2014. Retrieved from <http://www.iiibf.org/elibrary/muchapra/B4.26%20Monetary%20Management%20in%20an%20Islamic%20Economy.pdf>.
- Chapra, Muhammad Umer. (1985). *Towards a just monetary system: a discussion of money, banking and monetary policy in the light of Islamic teachings*. Islamic Foundation: UK
- Chapra, Muhammad Umer. (1984). "Money and Banking in Islamic Economy". in M. Ariff, ed. (Jeddah: International Centre for Research in Islamic Economics, King Abdul Aziz University, (1982). Accessed on May, 5th 2014. Retrieved from

<http://www.iiibf.org/elibrary/muchapra/B4.1%20Money%20and%20Banking%20in%20an%20Islamic%20Framework.pdf>

- Cohen, Jacob. (1988). *Statistical Power Analysis for Behavioral Science*. Lawrence Erlbaum Associate.
- Cooper, Harris. (2009). *Research Synthesis and Meta-Analysis: A Step-by-Step Approach (Applied Social Research Methods. 4th Edition*. Sage Publication.
- Cooper, George. (2008). *The Origin of Financial Crises: Central Banks, Credit Bubbles and the Efficient Market Fallacy*. Harriman House Ltd. : UK
- Cologni, Alessandro and Manera, Matteo. (2005). “Oil Prices, Inflation and Interest Rates in a Structural Cointegrated VAR Model for the G-7 Countries”. Retrieved on May 5TH 2014 from <http://www.feem.it/Feem/Pub/Publications/WPapers/default.htm>
- D’Adda and Scorcu. n.d. Real Interest Rate and Growth: An Empirical Note. Working papers. Retrieved on May 5TH 2014 from <http://amsacta.unibo.it/764/1/276.pdf>
- Doğrul, H. Günsel and Soytaş, Ugur. (2010). “Relationship between oil prices, interest rate, and unemployment: Evidence from an emerging market”. *Energy Economics* 32 (2010) 1523–1528.
- Davidson, Roy Ruxton. (2013). “Austrian Business Cycle: An Application to New Zealand’s Recent Boom and Bust. Master Thesis. Retrieved on May 5th, 2013 from <http://www2.gcc.edu/dept/econ/ASSC/Papers2013/ASSC2013-DavidsonRoy.pdf>
- Garrison, Roger W. (1994). “Hayekian Triangles and Beyond”. Retrieved on May 5th, 2013 from <http://www.auburn.edu/~garrir/b3beyond.htm>
- Hazlitt, Henry. (1978). *The Inflation crisis and how to resolve it*. Arlington House, New York: Ludwig Von Mises Institute.
- Hansen, Bruce E. and Seshadri, Ananth, Uncovering the Relationship between Real Interest Rates and Economic Growth (December 18, 2013). Michigan Retirement Research Center Research Paper No. 2013-303. Available at SSRN: <http://ssrn.com/abstract=2391449> or <http://dx.doi.org/10.2139/ssrn.2391449>
- Helmerson, Tobias and Selleby, Karl. (2009). “Empirical Testing of Austrian Business Cycle Theory”. Undergraduate Thesis. Jongkopin International Business School.

- Ibrahim, Mansoor H. (2006). "Monetary Dynamics and Gold Dinar: An Empirical Perspective". *Journal of King Abdulaziz University – Islamic Economic*, Vol. 20, No. 1, Jeddah (pp. 3-20)
- Khin, Aye Aye; Seethaetchumy ; Thambiah; Chau Wong Hong; Mohamadpour, Babak and Balakrishnan, Gowri. (2014). Monetary Policy and Gross Domestic Product in Malaysia: An Econometric Investigation. *Middle-East Journal of Scientific Research* 19 (4): 602-609, 2014
- Mankiw, Gregory. (2013). *Macroeconomics*. 8th edition. Worth Publisher
- Meera, Ahmad Kameel., & Larbani, Moosa. (2009). Seigniorage of Fiat Money and the Maqāsid al-Sharī'ah: The Unattainableness of the Maqāsid. In A. K. Meera, *Real Money* (pp. 1-34). Kuala Lumpur: IIUM Press.
- Menger, Carl. (1892). *On the Origins of Money*. Creative Commons Attribution. LicenseLudwig von Mises Institute
- Mises, Ludwig Von. (1953). *The Theory of Money and Credit*. Translated by H.E. Batsan. Yale University Press: USA. Ludwig Von Mises Institute.
- Mulligan, Robert F. (2006). "An Empirical Examination of Austrian Business Cycle Theory". *The Quarterly Journal of Austrian Economics*. Vol. 9, No. 2 (Summer 2006), pp: 69-93.
- Mulligan, Robert F. (2005). "The Austrian Business Cycle: a Vector Error-correction Model with Commercial and Industrial Loans". *Journal of Private Enterprise*, Volume XXI, Fall 2005. Retrieved on October, 1st 2012 from http://journal.apee.org/images/d/d8/Fall2005_5.pdf
- Obamuyi, Tomola, M. and Olorunfemi, Sola. (2011). "Financial Reforms, Interest rate Behaviour and Economic Growth in Nigeria". *Journal of Applied Finance & Banking*, vol.1, no.4, 2011, 39-55
- Parnaudeau, Miia. (2008). "European Business Cycle in the Austrian Framework". *The Quarterly Journal of Austrian Economics*. Vol. 11, pp: 94-105.
- Palalic, Ramo and Bajram, Narela. (2012). Why Gold Dinar in International Trade as Medium of Exchange: Descriptive Analysis of History of Gold Money, Trends, Perspectives and Implications. 3rd International Symposium on Sustainable Development, May 31 - June 01 2012, Sarajevo

- Putriani, Diah. (2013). "The Long Run Relationship between Interest Rate and Business Cycle: Austrian Economics vis A vis Islamic Perspective". Master research paper. IIUM
- Rehman, Atiq Ur and Ghaffari, Abubakar. (2012). "Failure of Interest Based Monetary Policy: Evidences From Selected Islamic and Non-Islamic Countries". *Paper presented in 5th International Conference on Islamic Banking and Finance*. Amman, Jordan: October, 6th-8th 2012.
- Ricardo, Rico and Putriani, Diah. (2013). "Low Interest Rate and Business Cycle in Malaysia: Maqasid Al-Sharia Perspective. Working Paper.
- Romer, (2012). *Advanced Macroeconomics*. Mac Graw Hill.
- Thomas, C. Taylor. (1980). *An Introduction to Austrian Economics*. Cato Institute: Auburn-Alabama. Ludwig Von Mises Institute.
- Sayyid Quthb. N.d. Retrieved on May, 5th 2013 from <http://islampos.com/50186-50186/>
- Schulak, Eugen Maria and Unterkofler, Herbert. (2011). *The Austrian School of Economics: A History of Its Ideas, Ambassadors, and Institutions*. Translated by Arlene Oost-Zinner. Ludwig Von Mises Institute: Auburn-Alabama.
- Sechrest, Larry. J. (2006). "Explaining Malinvestment and Overinvestment". *The Quarterly Journal of Austrian Economics*, Vol. 9, NO. 4: 27–38. Retrieved on May 5th, 2013 from http://mises.org/journals/qjae/pdf/qjae9_4_4.pdf
- Sherman, Howard J. (1991). *The Business Cycle: Growth and Crisis under Capitalism*. New Jersey: Princeton University Press.
- Tempelman, Jerry, H. (2010). "Austrian Business Cycle Theory and the Global Financial Crisis: Confession of a Mainstream Economics". *The Quarterly Journal of Austrian Economics*, Vol. 13, No. 1 (2010)
- Toutouchian, Iraj. (2009). *Islamic Money and Banking: Integrating Money in Capital Theory*. Singapore: John Wiley Pte. Ltd.
- Udoka and Rolan. (2012). "The Effect of Interest Rate Fluctuation on the Economic Growth of Nigeria, 1970-2010". *International Journal of Business and Social Science Vol. 3 No. 20 [Special Issue – October 2012]*
- Zaman, Asad. (2011). *Crisis in Islamic Economics: Diagnosis and Prescription*. 8th International Conference on Islamic Economics and Finance. Retrieved on May 5th, 2013 from <http://conference.qfis.edu.qa/app/media/252>.

Zaman, Asad. (2012). Crisis in Islamic Economics: Diagnosis and Prescription: Comments. *JKAU: Islamic Econ.*, Vol. **25** No. 2, pp: 227-250. Accessed on May 5th 2014.

Appendix

Weighted average Z	0.476
CI_Z95%	$0.476 \pm 1.96 \sqrt{1996}$
CI_Z95%	0.520
CI_Z95%	0.432
CI_Z95%	0.520 ± 0.432

Conclusion Reject the Ho that there is no relation between R and GDP

Detail Formula: see subchapter 2.1. Methodology

No	Author	tstat	Coef	def	R _{et}	r-index	ni	zi	ni-3	(ni-3)zi
1	Independent study 1	-5.88406	-0.00812	123	0.00138	0.46867	124	0.5084	121	61.5164
2	Independent study 2	-4.50633	-0.00356	419	0.00079	0.21500	420	0.2184	417	91.0728
3	Independent study 3	-163.449	-0.89897	36	0.00550	0.99933	37	4.0005	34	136.017
4	Independent study 4	-10.5	-0.02100	95	0.00200	0.73291	96	0.935	93	86.955
5	Independent study 5	-7.54717	-0.16000	95	0.02120	0.61224	96	0.7125	93	66.2625
6	Independent study 6	-8.33333	-0.07500	95	0.00900	0.64984	96	0.775	93	72.075
7	Independent study 7	-47.0588	-0.08000	95	0.00170	0.97922	96	2.2782	93	211.8726
8	Independent study 8	3.123616	1.69300	95	0.54200	0.30519	96	0.3152	93	29.3136
9	Independent study 9	-0.08411	-0.36000	34	4.28000	0.01442	35	0.0144	32	0.4608
10	Independent study 10	-10.6471	-0.36200	40	0.03400	0.85975	41	1.2924	38	49.1112
11	Independent study 11	-0.43447	-0.30500	30	0.70200	0.07908	31	0.0792	28	2.2176
12	Independent study 12	-0.23684	-0.09000	99	0.38000	0.02380	100	0.0238	97	2.3086
13	Independent study 13	-0.00076	-0.00500	83	6.56500	0.00008	84	0.0001	81	0.0081
14	Independent study 14	-0.08936	-0.35806	147	4.00710	0.00737	148	0.0074	145	1.073
15	Independent study 15	-0.0513	-0.25114	147	4.89590	0.00423	148	0.0042	145	0.609
16	Independent study 16	-0.0118	-0.07483	147	6.34218	0.00097	148	0.001	145	0.145
17	Independent study 17	-5.79611	-0.46369	111	0.08000	0.48201	112	0.5256	109	57.2904
18	Independent study 18	-0.05719	-0.30200	42	5.28100	0.00882	43	0.0088	40	0.352
19	Independent study 19	-9.28571	-0.02600	101	0.00280	0.67863	102	0.8266	99	81.8334
	Total					7.122	2053	12.5267	1996	950.4940