

DELETING ZEROES AND CREATING VALUE: PSYCHOLOGICAL IMPACT TO CONTROL INFLATION

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Abstract. *Inflation is a big threat to economy around the globe. To control inflation redenomination could be used. Redenomination is a policy to change the denomination of a currency at a specific ratio. The economists around the world seem to be confused to use redenomination as a tool to control inflation. The current study provides insight into the perplexed phenomenon of redenomination. The study aims to examine the impact of redenomination on inflation. The secondary data were collected from five hyper inflationary countries: Bulgaria, Argentina, Romania, Turkey and Brazil to investigate the impact of deleting zeroes on economy. The results revealed that there was statistically significant impact of redenomination on consumer price index (CPI). One-unit redenomination would decrease the inflation about 0.91 units. It was therefore, concluded that redenomination could be used to control the inflation which leads to stabilization of economy of world. It is recommended that redenomination can be applied as an anti-inflation policy in countries having higher level of prices.*

Keywords: *inflation; money supply; redenomination; Vector Autoregressive Model; Augmented Dicky-Fuller.*

Introduction

Redenomination is a policy to change the denomination of a currency at a specific ratio (Dogarawa, 2007). Currency redenomination is a measure which helps government to announce monetary dominance as an end to a reform process instead of stabilization instrument (Mosley, 2005). The use of redenomination as a tool of appropriation is more exclusion than the rule (Mas, 1995, p.483). Redenomination is a country's currency adjustment process due to serious inflation and devaluation of currency (Dzokoto, & Mensah, 2010).

Currency devaluation is a prime monetary phenomenon and that its effects originate from decline in the value of money resultant upon devaluation (Kalyoncu, Artan, Tezekici & Ozturk, 2008, p.232). Devaluation of currency is often considered as an instrument to improve foreign sector of an economy. Aziz, (2009) argues that depreciation or devaluation of currency increase the prices of imports as compare to its exports, and it also caused to improve trade balance.

The difference between redenomination and devaluation is that the redenomination is used for internal purpose for a country, unlike devaluation is used for changing the foreign rates of exchange (Paul, 2006, p.75). Devaluation is joined with suitable counter-inflationary monetary and fiscal policy, and is a part of a credible macroeconomic strategy, it leads to a new rate of exchange that is supposed by private capital markets to be close or below to the equilibrium real rate, it has a positive impact on capital flows and creditworthiness (Bird & Rajan, 2004, p.141).

Sanering is a Dutch term, which means reorganize, restructuring and clean-up. In the context of monetary science, sanering can be defined as reducing the value of money to decline the high inflation rate. Example, Rp 100 the value is declined to Rp 10, while the price of goods is still the same. Inflation is the condition of rising prices, increase in monetary circulation; and the more precisely, as an expansion in the quantity of money times the velocity of money circulation, value of market for short (Oduola & Akinlo, 2001, p.200).

Several countries use to delete three or more than three zeroes from their national currency. This event happens many times in countries like Bulgaria, Argentina, Romania, Turkey and Brazil. However, it is observed that elimination of zeroes from national currency can only be effective if at the similar spell, disinflation policies are carried out simultaneously. However, positive effects and the psychological dimensions can be applied to create value and to control inflation (Mehdi, Safdari & Reza, 2012, p.1137). The economics' positive effects can be used in liquidity management and anti-inflation policy. It may be used to lapping several zeroes from the national currency in the monetary policy objectives of the country (Mas, 1995, p.483).

The value of currency of a country depends upon many factors like securing the costs, government efficiency, judicial and legal stability for inviting outside investments, being in line with the worldwide changes and observing the international law and regulation. The devaluation of national currency leads to several psychological and social effects on the economy of a country. When the currency is being depreciated by a country, general public feels some kind of mortification with respect to the countries

having strong money. However, devaluation in currency value and its volume carry about too many hygienic effects on the economy (Feige, 2003, p.358).

When the people show an inclination of using foreign currency for daily exchange instead of national money, "currency replacement" phenomenon occurs. Removing zeros from national currency is very important to maintain the national currency value in those countries where inflation prevailing on high level. Also, deleting zeroes from the domestic currency can be understood a political and technical phenomenon considered as a subpart of economic reforms package (MirHosseini & Rad, 2011, p.20).

In Iran, consumer price index increases nearly 570 times in 1389. Resultantly, the largest bill approves to cut from 10,000 Riyals to 100,000 Riyals. In 1389, cut bills increase the price, the highest and the biggest 6,000,000 Riyals coins were almost 20,000 Riyals. Actually, reducing the money's purchasing power accumulates to about four eras. In the economic activity and transactions settlement, if the acute problem is not observed, the central bank will be unable to use for a long period of time, because of legal problems and temporary solutions in its monitoring (Suhendra & Handayani, 2012).

Secure economic conditions, low inflation rate, guarantee of price stability and Interaction to the society are the four absolute requirements for applying redenomination policy. When the redenomination cost and risk are high; the government of a country spends a greater amount to print new currency notes and coins to adjust old ones because the cost of redenomination and expenses for public education about the redenomination are high that they will apply (Tegene, 1991, p.1369). Resultantly, the redenomination can be used to convey the private markets and citizens that the high inflation period is over. The new currency is not the result but the cause of stabilization (Odusola & Akinlo, 2001, p.199). But the currency redenomination is only a symbolic event in this role. It is used as a symbol to resolve process, not a tool to end the greater rate of inflation.

Theoretical background

The resolution of redenomination is generally used in those countries where too many zeroes exist in their national currency. Since 1960's, the governments of the developing countries have been enforced to delete several zeroes from their domestic currency. After the World War II, Germany was first time experienced the deleting zeroes from their currency. Under the pressure of economic after World War II and stayed harm, the nation of Germany faced a massive inflation that forced the maker of policies to delete the zeroes from national currency. Since the last 50 decades, 19 countries have deleted zeroes from their domestic currency and this happened twice in 10 countries. The zeroes have been deleted from the national currencies 6 times in Brazil, 5 times in Yugoslavia, 4 times in Argentina, 3 times in Belgium, Russia, Ukraine and Poland, two times in Bolivia, and only once in Korea, Island, Ghana and Turkey (MirHosseini & Rad, 2011, p.21).

Redenomination theory

The meaning of redenomination is that the face value of coins and bank notes in circulation is changed (in practice decrease). With the redenomination of currency, all prices are declined by the same value, in the economy. No one subject is affected directly in the market by this process. By issuing new bank notes in the economy or by stamping the old ones, this process is accomplished usually. When the economy of a country is affected seriously by dollarization or when there is hyperinflation in the country, the redenomination of currency is applied. Many difficulties occur in the country due to high level of prices, as for example – statistical evidences, difficulties with communicating nominal values of services and goods, with accounting, banks payment system, dealing with the software and the like (Zidek & Chribik, 2015, p.908).

According to the redenomination of currency theory, there is no direct impact of redenomination on the inflation because redenomination does not change any basic indicator that impact inflation directly. The rounding of prices could be small and only exception; the new prices in the market could be rounded up slightly (Ioana, 2005). Actually, in the both versions (new and old), prices are depicted. But there is an indirect impact of currency redenomination on inflation in the form of decreasing expectations of inflation (Mosley, 2005).

Significance of study

There is an important role of this measure in boosting up the confidence of public in governments. In self-governing regimes, deleting zeroes from a country's national currency can play an important role in electing again for a specific party. If in national currency, people drop their confidence, they will begin to use currency of other countries and this will leave a massive psychological and economic pressure on the governments. Therefore, the government's economic policies will be affected by foreign financial markets and international central banks will influence policies of economic of a country. Thus, cutting zeroes from national currencies will foreclose the penetration of international currencies in the consequences and in the country's economy. The principle objective of the study is to find out the impact of redenomination on inflation.

Literature review

Overall 19 countries have used the currency redenomination one time, in 10 countries this happened twice. The zeroes have been removed from the national currencies 6 times in Brazil, 5 times in Yugoslavia, 4 times in Argentina, 3 times in Belgium, Russia, Ukraine and Poland, two times in Bolivia, and only once in Korea, Island, Ghana and Turkey (MirHosseini & Rad, 2011, p.22). According to Atasoy & Saxena, (2006, p.30), Argentina redenominated 13 zeroes in 4 times (1992, 1985, 1983, 1970); Brazil 18 zeroes in 6 times (1994, 1993, 1989, 1986, 1970, 1967); in 4 times (1985, 1980), Israel 9 zeroes; Bolivia 9 zeroes in 2 times (1987, 1963); only one time (1993), Mexico redenominated 3 zeroes; Poland in one time (1995), 4 zeroes; Ukraine in one time (1996), 5 zeroes; 3 times (1998, 1961, 1947) in Russia; Iceland redenominated 2 zeroes in one time (1981); and Peru redenominated 6 zeroes in 2 times (1991, 1985).

The redenomination of currency is generally happened when the countries are facing pressures of hyper-inflation which makes the currency of a country unattractive. A strong case of hyper-inflation is cited by Atasoy & Saxena, (2006, p.30) in Turkey, where cost of Toyota corolla was 32 billion (32,900,000,000 TL), cost of drinking a bottle of water 0.0003 billion (300,000 TL), Ticket of a movies 0.0075 billion (7,500,000 TL), and the gross domestic production in 2002: 273 quadrillion (273,463,167,795,000,000 TL), redenominated by slashing 6 zeroes before the of old Lira. Similarly, Aluko (2007) cited the experienced years of Zimbabwe that influenced by inflation 1200% in a year.

On 5th July 1999, when Bulgaria removed three zeroes from the currency, Bulgarian old Lev was exchanged with new Lev in 1:1000 ratios. As on the same date 1 new Lev was equaled to 1000 old Lev (equaled to 0.55 USD, 1 Deutsche Mark or Euro 0.55). All the prices were listed both in old and new Lev until 31st December 1999, after that, all the prices were listed only in new Lev. The whole process was executed to smooth payments, exchange and accounting operations (Lianto & Suryaputra, 2012, p.1).

In Argentina, downturns of economic considerably devalued its currency and in 1992 it carried out dollar crisis. So, government of Argentina had to accept economic improvements by deleting zeroes from the currency to control the sharply rising inflation. In the year of 1960, 1100-3500 pesos of Argentina was equal to one US dollar. When Argentina shed two zeroes from its national currency, the peso value of Argentina fixed to the value of dollar. During the 1980's, 18000-180000 pesos were exchanged with one dollar. Thus, in 1983 government of Argentina decided to eliminate 4 zeroes from its national currency but failed, and in 1990's, subsequently to the monetary policy, by deleting 4 zeroes from its currency, Argentina was reached to the desired goal and it declined the rate of inflation dramatically (Calomiris, 2007, p.155; Zidek & Chribik, 2015, p.910).

Turkey is a European country while having the grounds like other developing countries. The Turkey has suddenly eliminated 6 zeroes from the currency in the year of 2005. In the beginning of 1980's, inflation started in Turkey. In 1988, one United States dollar was equal to 1422 Turkish old Lira, and in 2003 it went above 5.1 million Liras. In Turkey, the price of one sandwich was three million old Liras. From 1981, there was a need of having large notes after every two years. In a cycle of 25 years, the highest bill of Turkey went from 5000 Lira to 1 million Liras, after this, it reached up to multi trillion Liras due to which Turkish people faced many problems. According to a survey report of 2000's, a piece of bread price was multi trillion Liras in Turkey. On the first day of January 2004, the instructions were presented to slash 6 zeroes from national currency of Turkey, but it was executed on the first day of January 2005, the new coins and the bills were entered in the market, and the new name of Turkish currency was "New Lira". Zero deleting from the currency of Turkey became coincidental with full inflation inhibition by using different tools of economics. Consequently, the new Turkish Lira came to be able to meet its responsibilities as a new unit of exchange (Central Bank of the Republic of Turkey, 2005). Turkey has executed mitigating and reformative measures for more than two times. Some volatilities of inflation were results of Turkey's mitigating plans. These plans were executed as a political package. Turkey observed the sequence of these plans and finally, they tracked realization of independence of its central bank through improving its system of banks. The disciplined budget announcement by the country's

government was linked with the surplus of the budget for some years in the country. Thus, deleting some zeroes from national currency of Turkey did not result in negative effects of allocation/distribution. But in turn, it has reformed the mechanisms of economic allocation via getting the confidence of the general public and attaining a reputation for the Turkish government (Central Bank of the Republic of Turkey, 2005).

Brazil faced one of the greater inflation in the period of 1960's and 1970's because of which the value of the national currency of Brazil was decreased 30 to 40 per cent every month. Earlier that, the name of Brazil's currency had changed two times in between 1930-1942. In the period of 1967, Brazil deleted three zeroes from its national currency named "Cruzeiro" and the new name of Brazilian currency was "New Cruzeiro". Though the government of country failed to control inflation, and in 1981 the inflation went up to 151 per cent, during this period Brazil slashed three zeroes again from its national currency. The inflation rate increased again and went 1972 percent in 1989, and the government of Brazil deleted three more zeroes from the national currency and changed the currency name. When the inflation rate reached about 2000 percent in 1993, the Brazilian government removed another three zeroes from its national currency. But this time, Brazil controlled the inflation. Although, Brazil is a country which is still considered most expensive country among the American countries. From 1930 to present, Brazil has been eliminated total 18 zeroes from its national currency in 6 periods of times and has been changed the currency name 8 times (Martinez, 2007) and (MirHosseini & Rad, 2011, p.22).

Upadhyaya, (1999, p.197) have examined the impact of devaluation of currency on the aggregate output level in six Asian countries by applying a unique methodology established by Fouere et al. (2000, p.293). They suggested that devaluation of currency is neutral in long run. Thissen and Lensink (2001, p.411) have presented a general model of equilibrium for Egypt by using a new calibration method. This model was used to check the macroeconomic impact on currency redenomination. They found that the effect of redenomination on the production was substantial and on the current account was small.

Bacchetta & Wincoop, (2005, p.295) explained that redenomination of currency of foreign trade has significant policy implications. Hartmann, (1998, p.424) found that when a country formulated a monetary union, the new currency was used more broadly in international trade than the sum of the currencies it replaced. Odior & Shodeinde (2013, p.8) have examined the prospective policy implications of new currency reformation application on the economy of Nigeria. They found that the prospective policy implications of the new currency reformation exercise were to increase money in circulation, supply of money and inflation rate.

Methodology

In order to achieve the objectives of the study, the data were used as given below:

Data sources and sample

The current study conducted in five countries that had implemented the redenomination policy. For analysis, twelve quarters before and twelve quarters after

redenomination period data were collected. The models were adjusted for quarterly data that had been taken from different sources like World Bank, International Monetary fund, International Financial Statistics, Global Economy and Trading Economy. For analysis purpose, Eviews-8 was applied.

Variables

Consumer price index (CPI) was used as a dependent variable while redenomination (redenm) as independent variable. Gross domestic product (GDP_real), money supply (M3_ms) and interest rate (INT_rate) were used as control variables of the study.

Hypotheses

H₁. The trend in consumer price index is not same before and after redenomination.

H₂. Redenomination helps in declining inflation.

Econometric models

Two econometric models were applied in the study. In the first model, study estimated the price level evolution via time trend when the CPI (dependent variable) was predicted as a time function. A biquadratic time trend was selected by applying OLS estimation:

$$\text{CPI} = \gamma_0 + \gamma_1 * t + \gamma_2 * t^2 + \gamma_3 * t^3 + \gamma_4 * t^4$$

Afterward, to check whether redenomination caused a structural break or not, study applied Chow Structural Break test. The probability value of Chow Structural Break test was zero up to four decimals. This means the first hypothesis was rejected, i.e. the trend of CPI is same for both segments (after and before redenomination) Figure-1.

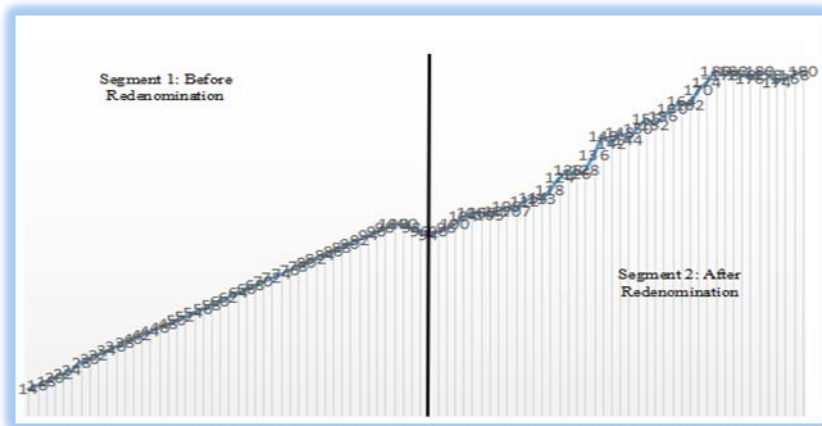


Figure 1. Trend in Consumer Price Index (CPI) in both segments
(Author generated)

On the basis of Chow test, study could not perfectly confirm that the redenomination was the direct cause of structural break. So, the study presented a second model in the

form of Vector Autoregressive model (VAR). This model offered a strong argument on the impact of redenomination. The first equation of the VAR₁ (1) was as under:

$$CPI_t = c + \varphi_1 * t_CPI_{t-1} + \varphi_2 * t_GDP_real_{t-1} + \varphi_3 * t_INT_rate_{t-1} + \varphi_4 * t_M3_ms_{t-1} + \psi * redenm + \varepsilon_t$$

Where; c = constant, φ = coefficients, t_CPI= Consumer Price Index, t_GDP_real = real GDP, t_M3_ms = money supply M3, t_INT_rate = real interest rate, redenm. = redenomination and ε = error term.

Empirical results

The application of Vector Autoregressive model is accustomed by the stationarity of time series data. The study applied the mostly used Augmented Dickey Fuller (ADF) unit root test for each variable. The Table-1 showed that data were not stationary in case of three variables i.e. CPI, M3_ms and REDNM. The data of these variables became stationary at first difference. The data of variable GDP_real and INR_rate was stationary at level.

Table 1. Augmented Dickey-Fuller (ADF) Test

Variable	At Level			First Difference		
	ADF Statistics	Critical Value		ADF Statistics	Critical Value	
CPI_1	-1.82220	1% Level	-4.02543	-11.41903***	1% Level	-4.02592
	(0.68880)	5% Level	-3.44247	(0.00000)	5% Level	-3.44271
		10% Level	-3.14588		10% Level	-3.14602
M3_ms	-2.58757	1% Level	-4.02543	-12.04745***	1% Level	-4.02592
	(0.28670)	5% Level	-3.44247	(0.00000)	5% Level	-3.44271
		10% Level	-3.14588		10% Level	-3.14602
REDNM	-3.12103	1% Level	-4.02543	-11.62856***	1% Level	-4.02592
	0.11560	5% Level	-3.44247	(0.00000)	5% Level	-3.44271
		10% Level	-3.14588		10% Level	-3.14602
GDP_real	-8.51400***	1% Level	-4.02543	-6.80144***	1% Level	-4.02960
	(0.00000)	5% Level	-3.44247	(0.00000)	5% Level	-3.44449
		10% Level	-3.14588		10% Level	-3.14706
INT_rate	-8.11820***	1% Level	-4.02543	-23.33886***	1% Level	-4.02592
	(0.00000)	5% Level	-3.44247	(0.00000)	5% Level	-3.44271
		10% Level	-3.14588		10% Level	-3.14602

(Source: Author generated)

The (***) indicates the rejection of null hypothesis at 1% of the level of significance.

Note: Consumer Price Index (CPI_1); Money Supply (M3_ms); Redenomination (REDNM); Real Gross Domestic Product (GDP_real); Interest Rate (INT_rate)

Table-2 showed that there was statistically significant impact of redenomination on consumer price index at the significance level of 0.01. INT_rate was also significant at 1% level. One unit change in the consumer price index (CPI) in the preceding year caused 1.002 units increase in the current year growth of price level. GDP_real and M3_ms were statistically insignificant. The coefficient of redenomination was negative which means that redenomination could cause a decrease in inflation. These outcomes confirmed the redenomination theory that there is an indirect impact of currency redenomination on inflation in the form of decreasing inflationary expectations (Mosley, 2005).

Table 2. Results of Vector Autoregressive Model (VAR₁)

Variable	Coefficient	Standard Error	t-Statistics	p-value
Constant	131.8043	165.6930	0.7955	0.6985
CPI_1	1.0024	0.0985	10.1743	0.0000***
GDP_real	-7.0206	13.8153	-0.5082	0.6115
INT_rate	0.2306	0.0684	3.3698	0.0008***
M3_ms	-46.5517	83.9227	-0.5547	0.5793
REDENM	-0.9057	0.1106	-8.1914	0.0000***
R-squared	0.9033	Mean dependent variable		737.2809
Adjusted R-squared	0.8957	S.D. dependent variable		1251.3910
S.E. of regression	404.2084	Sum squared residuals		20749820
Durbin-Watson statistics	2.0105	F-statistics		118.6094

(Source: Author Generated)

*** indicates significance level at 1%

Note: Consumer Price Index (CPI_1); Money Supply (M3_ms); Redenomination (REDNM); Real Gross Domestic Product (GDP_real); Interest Rate (INT_rate)

The market subjects should be convinced that inflation was a negative aspect of old currency of a country that would not recur with the new currency. In this case, due to the different behavior of market subjects inflation could decline. From this point, redenomination could be a tool to control inflation that ultimately helps in declining the inflationary expectations and stabilizing the level of prices. On the basis of these results, it was concluded that redenomination helps in declining inflation and leads to stabilization of price level.

It is necessary to mention that general costs were also associated with the application of redenomination policy as well. The nominal costs were on changing in software and advertising campaigns, on printing new banknotes and minting coins. The application of redenomination policy was complicated because the government must be responsible for overall synchronization of the process that had an impact on everybody in the entire economy.

In two ways, the redenomination can be helpful to reduce inflation. First, at the end of economic stability program, the deleting zeroes from the currency of a country can be done to provide confidence to private agencies and to the people that the period of greater inflation has gone. It is totally symbolic to remove zeroes in such a condition because inflation has been controlled due to other factors and cutting zeroes from the currency will not lead to minimize the inflation on its own. Secondly, it will gain the confidence of foreign investors and thus facilitating the economic growth process, attracting the foreign direct investment for countries. Finally, to increase the national currency value, economic power should also be increased. In fact, with the help of powerful economy, national currency value can be stronger and by controlling inflation, the positive measure would be taken in long term. Therefore, the opinion of the public should be organized before any task in order to be habituated with new money and conditions. In simple words, a good way for successfulness of this policy is giving opportunity and engaging people to be accustomed to new money and conditions.

Conclusion

It is observed from the previous literature that zeroes elimination from the national currency can be effective only when it is attended by the government's policies of anti-inflation. Otherwise, financial regularities and financial policies seem to be useless to control inflation, as elimination of zeroes will lose its psychological impacts very soon and return back with more strength. The better solution to execute the programs of economic stability and to control the rising inflation is central bank's independence from the government of a country and eliminating the problematic economic policies.

There was statistically significant impact of redenomination on consumer price index at the significance level of 0.01. It is therefore concluded that to control the inflation redenomination could be used. One-unit redenomination will decrease the inflation about 0.91 units. It could be recommended to the countries having high inflation rate to use redenomination to control inflation which leads to stabilization of the price level.

The prices might witness some inflation while applying the redenomination policy. Along with the alteration in the domestic currency some people want to maximize the prices of their goods. In the meantime, result of declining the basic currency might be in the shape of rounding off the prices to get rid of small coins which leads to the inflation. By providing necessary information and proper supervision, this problem can be minimized in order to avoid tangible effects on the economy of a country.

References

- Aluko, S.A. (2007). The Proposed New Naira, Exchange Rate and the Nigerian Economy. Retrieved from <http://www.nigerianmuse.com/20070901133324zg/sections/other-peoples-essays/sam-aluko-the-proposed-new-naira-exchange-rate-and-the-nigerian-economy/>.

- Atasoy, D., & Saxena, S.C. (2006). Misaligned? Overvalued?. The Untold Story of the Turkish Lira. *Emerging Markets Finance and Trade*, 42(3), 29-45.
- Aziz, R. (2009). The Redenomination of the Ghanaian Currency (2007)- A Study of Its Impact on the Business of the Financial Institutions in Ghana (Dissertation). Retrieved from <http://urn.kb.se/resolve?urn=urn:nbn:se:bth-1185>.
- Bacchetta, P., & Van Wincoop, E. (2005). A theory of the currency denomination of international trade. *Journal of International Economics*, 67(2), 295-319.
- Bird, G., & Rajan, R.S. (2004). Does devaluation lead to economic recovery or contraction? Theory and policy with reference to Thailand. *Journal of International Development*, 16(2), 141-156.
- Calomiris, C.W., 2007. Devaluation with contract redenomination in Argentina. *Annals of Finance*, 3(1), 155-192.
- Central Bank of the Republic of Turkey (2005). Redenomination of Turkish Lira by Dropping Six Zeros. Retrieved from http://scholar.googleusercontent.com/scholar?q=cache:XsVlI9waJ6QJ:scholar.google.com/+Central+Bank+of+the+Republic+of+Turkey&hl=en&as_sdt=0,5.
- Dogarawa, A. (2007). *The economics of currency redenomination: An appraisal of CBN redenomination proposal*. University Library of Munich, Germany. Retrieved from <http://EconPapers.repec.org/RePEc:pra:mprapa:23195>.
- Dzokoto, V.A.A., & Mensah, E.C. (2010). Making sense of a new currency: an exploration of Ghanaian adaptation to the new Ghana cedi. *The Journal of Applied Business and Economics*, 10(5), 11-15.
- Feige, E.L. (2003). Dynamics of currency substitution, asset substitution and de facto dollarisation and euroisation in transition countries. *Comparative Economic Studies*, 45(3), 358-383.
- Fouere, T., et al. (2000). Dietary changes in African urban households in response to currency devaluation: foreseeable risks for health and nutrition. *Public health nutrition*, 3(3), 293-301.
- Hartmann, P. (1998). The currency denomination of world trade after European Monetary Union. *Journal of the Japanese and International Economics*, 12(4), 424-454.
- Ioana, D. (2005). The National Currency Re-denomination Experience in Several Countries: A Comparative Analysis. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1347407
- Kadir, H.A., Masinaei, R., & Rahmani, N. (2011). Long-Term Effects of Bank Consolidation Program in a Developing Economy. *Journal of Asia Pacific Business Innovation and Technology Management*, 1(1), 20-30.
- Kalyoncu, H., Artan, S., Tezekici, S., & Ozturk, I. (2008). Currency devaluation and output growth: an empirical evidence from OECD countries. *International Research Journal of Finance and Economics*, 14(3), 232-238.
- Lianto, J., & Suryaputra, R. (2012). The impact of redenomination in Indonesia from Indonesian citizens' perspective. *Procedia-Social and Behavioral Sciences*, 40, 1-6.
- Martinez, I. (2007). Reflections from Latin America: Can new currency abate Venezuelan inflation, library of economics and liberty. Retrieved from <http://www.econlib.org/library/Columns/y2007/Martinezinflation.html>.
- Mas, I. (1995). Things governments do to money: A recent history of currency reform schemes and scams. *Kyklos*, 48(4), 483-512.
- Mehdi, S., & Reza, M. (2012). An investigating Zeros Elimination of the National Currency and Its Effect on National Economy (Case study in Iran). *European Journal of Experimental Biology*, 2(4), 1137-1143.

- MirHosseini, S.V., & Rad, R.Z. (2011). Deleting zeros from national currency: Investigation and analysis of removing zeros from Iran's national currency. *International Journal of Economics and Management Sciences*, 1(1), 20-24.
- Mosley, L. (2005), September. Dropping zeros, gaining credibility? currency redenomination in developing nations. In *2005 Annual Meeting of The American Political Science Association, Washington DC*. Retrieved from https://www.researchgate.net/publication/229051710_Dropping_Zeros_Gainin_g_Credibility_Currency_Redenomination_in_Developing_Nations.
- Odior, E.S., & Shodeinde, A.A. (2013). Currency Restructuring Exercise in Nigeria: overview and Potential Implications. *International Journal of Business and Social Research*, 3(6), 8-16.
- Odusola, A.F., & Akinlo, A.E. (2001). Output, inflation, and exchange rate in developing countries: An application to Nigeria. *The Developing Economies*, 39(2), 199-222.
- Paul, S. (2006). Devaluation, innovation, and prices. *The International Trade Journal*, 20(1), 75-83.
- Suhendra, E., & Handayani, S.W. (2012). Impacts of Redenomination on Economics Indicators. In *International Conference on Eurasian Economies*. Retrieved from <https://www.avekon.org/papers/395.pdf>.
- Tegene, A. (1991). Trade flows, relative prices, and effective exchange rates: a VAR on Ethiopian data. *Applied Economics*, 23(8), 1369-1376.
- Thissen, M., & Lensink, R. (2001). Macroeconomic effects of a currency devaluation in Egypt: An analysis with a computable general equilibrium model with financial markets and forward-looking expectations. *Journal of Policy Modeling*, 23(4), 411-419.
- Upadhyaya, K.P. (1999). Currency devaluation, aggregate output, and the long run: an empirical study. *Economics letters*, 64(2), 197-202.
- Zidek, L., & Chribik, M. (2015). Impact of Currency Redenomination on Inflation Case Study Turkey. *Asian Economic and Financial Review*, 5(6), 908-914.