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Impact of Injection and Withdrawal of Money Stock on Economic Growth in Nigeria

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Abstract

Economists believe that money supply or money stock relates to the total amount of money available in an economy at a particular point in time either exogenously determined by the Central bank or endogenously determined by changes in the economic activities, which affects people's desire to hold currency relative to deposits or rate of interest. Therefore, what role or impact does the injection and withdrawal of money stock into the economy has on the economic growth performance in Nigeria and what are the trends of such contribution to the Nigerian economy. This paper in providing solution to the above question therefore uses the ordinary least square method of simple regression models to analyze the effect of the injection and withdrawal of money stock on real Gross Domestic Product (GDP) as well as examining the transmission channel of the relationship between growth and money stock index covering the period of 1970 to 2008. In conclusion, observation of the theoretical and empirical analysis indicates that, injection of money stock into the economy tends to reduce interest rate thereby increasing investment. The study therefore recommends that the Central Bank of Nigeria needs to develop a strategic plan to deal with failing banks as well as deals with monetary policy in a more transparent manner so as to address the issues of expectations as inflation exhibits a high degree of inertia.

Keywords: Injection, withdrawal, money stock, economic growth.

1. Introduction

This study attempt to critically examine and analyse the role and the impact of injection and withdrawal of money stock on the economic growth performance in Nigeria. In economics, the money supply or money stock is the total amount of money available in an economy at a particular point in time. There are two theories of determination of the money supply. According to the first view, the money supply is exogenously by the Central bank. The second view holds that money supply is determined endogenously by changes in the economic activities, which affects people's desire to hold currency relative to deposits or rate of interest. Injection of money stock into the economy implies an increase it the total amount of money available in the economy at a particular time while withdrawal of money stock would imply a reduction of available money in the economy.

Money supply is an important aspect of government monetary policy. Governments use monetary policy, along with fiscal policy (which is concerned with taxation and spending), to maintain economic growth, high employment, and low inflation. Economists disagree on the ultimate effects of changes in the money supply. Two important schools of economic thought are Keynesianism and monetarism. Keynesians believe that an increased money supply can lead to increased employment and output. On the other hand, monetarists argue that an increased money supply ultimately only affects prices, leading to inflation, and that output is not increased.

Keynesians and monetarists also disagree about how changes in the money supply affect employment and output. Some economists argue that an increase in the supply of money will tend to reduce interest rates,

which in turn will stimulate investment and total demand. Therefore, an alternative way of reducing unemployment would be to expand the money supply. Keynesians and monetarists disagree on how successful this method of raising output would be. Keynesians believe that under conditions of underemployment, the increased spending will lead to greater output and employment. Monetarists, however, generally believe that an increase in the money supply will lead to inflation in the long run.

The different types of money are typically classified as "M"s. The "M"s usually range from M0 (narrowest) to M3 (broadest) but which "M"s are actually used depends on the country's central bank. In Nigeria, M1 is currency plus demand deposits or checking account balances; M2 is M1 plus net time deposits other than large certificates of deposit; m-3 is M-2 plus deposits at nonbank thrift institutions such as savings and loan associations. Various other components and combinations are also used. Money supply is important because it is linked to inflation by the equation of exchange in an equation proposed by Irving Fisher in 1911

$MV = PQ$

- M is the total dollars in the nation's money supply
- V is the number of times per year each dollar is spent
- P is the average price of all the goods and services sold during the year
- Q is the quantity of assets, goods and services sold during the year

According to Fisher, the nominal quantity of money in circulation (M) is an autonomous variable determined by the central bank. The total number or volume of transactions being a function of the level of income which is assumed to be the full employment income, the value of T is fixed in the short period. The velocity of money V is also constant being determined by the institutional and technological factors of the transaction process that do not change in the short period.

2.0 Review of Literature

From the work of Sims (2007), empirical consideration of whether or not financial variables can usefully be employed in conducting monetary policy has focused not only on the ability of these variables to predict movements in output and inflation, but also on whether or not they could help predict fluctuations that are not predictable by information contained in output and inflation themselves. The use of Vector Auto Regressions (VARs) to estimate the impact of money on economy was pioneered by Sims (2007). The development of the approach as it has moved from bivariate to a larger and larger systems, and the empirical findings the literature has produced, are summarized by Zha, Rubio and Waggoner (2004). The main attraction of tests from VARs is that they provide a natural basis for testing conditional predictability. As long as the financial variables contain some information that can independently predict movements in output or inflation, policy makers can exploit that information (Friedman and Kuttner (2010). VARs have been used to conduct forecasts of output and inflation in systems that contain a financial sector variable (Tallman and Wicker (2010), Black et al. (2002). Using different measures to compare the accuracy of the forecasts, the results from different financial variables are then compared. In this way, the relative importance of different variables is also checked. Because the ultimate test of an equation lies in its out of sample tests, many studies have also extended the analysis to compare in sample and out of sample forecasts while others have used conditional forecasting.

2.1 Empirical Review

A number of studies that look at the information content of monetary aggregates for inflation and output have been carried out. The studies available, however, are mainly on developed countries. However, many inflation studies on developing countries in general and Africa specifically, although not focusing on monetary aggregates per se, have included money aggregates, exchange rates and interest rate measures as explanatory variables. These can give us an indication of the importance of these variables for inflation.

Therefore, A few studies would be reviewed, specific to the topic and then some inflation studies on African countries.

A number of studies have employed the VAR methodology. By evaluating F-statistics and forecast performance measures, empirical work has shown that the issue of whether monetary aggregates are important for inflation or not varies from country to country and from one period to another. One of the studies important to the discussion here, using US data, is that by Friedman and Kuttner (2007). They used F- statistics to determine the importance of money variables in a VAR model. They find that both M_1 and M_2 are significant for inflation before 1980 and the significance disappeared when the data set is extended beyond that period. Of particular interest, they find that the commercial paper bill spread was a good information candidate for industrial production. This conclusion sparked a debate and some of the resulting papers are those of Emery (1996) who estimates recursive regressions and uses both Granger-causality and variance decompositions. He attributes the importance of this variable to the presence of outliers in the data.

2.1.1 How Government through the CBN Inject and Withdraw money from the Economy

First, it can allow banks to hold a smaller percentage of their deposits as reserves. A lower reserve requirement allows banks to make more loans and earn more money from the interest paid on those loans. Banks making more loans increase the money supply. Conversely, a higher reserve requirement reduces the amount of loans banks can make, which reduces or tightens the money supply.

The second way the C.B.N can inject money into the economy is by lowering the rate it charges banks when they borrow money from the C.B.N. This particular interest rate is known as the discount rate. When the discount rate goes down, it is more likely that banks will borrow money from the C.B.N, to cover their reserve requirements and support more loans to borrowers. Once again, those loans will increase the nation's money supply. Therefore, a decrease in the discount rate can increase the money supply, while an increase in the discount rate can decrease the money supply. In practice, however, banks rarely borrow money the C.B.N, so changes in the discount rate are more important as a signal of whether the C.B.N wants to increase or decrease the money supply. For example, raising the discount rate may alert banks that the C.B.N might take actions, such as increasing the reserve requirement. That signal can lead banks to reduce the amount of loans they are making.

The third way the C.B.N can adjust the supply of money and the availability of credit in the economy is through its open market operations—the buying or selling of government bonds. Open market operations are actually the tool that the C.B.N uses most often to change the money supply. These open-market operations take place in the market for government securities. The Nigerian government borrows money by issuing bonds that are regularly auctioned on the bond market in New York. The bank changes the amount of money in the economy when it buys or sells bonds. When the C.B.N pays for a federal government bond with a check, that check is new money—specifically, it represents a loan to the government. This loan creates a higher balance in the government's own checking account after the funds have been transferred from the Bank to the government. That new money is put into the economy as soon as the government spends the funds. On the other hand, if the C.B.N sells government bonds, it collects money that is taken out of circulation, since the bonds that the C.B.N sells to banks, firms, or households cannot be used as money until they are redeemed at a later date.

To summarize the C.B.N's tools of monetary policy: It can increase the supply of money and the availability of credit by lowering the percentage of deposits that banks must hold as reserves at the C.B.N, by lowering the discount rate, or by purchasing government bonds through open market operations. The C.B.N can decrease the supply of money and the availability of credit by raising reserve ratios, raising the discount rate, or by selling government bonds.

The CBN injects money stock when it wants to encourage more spending in the economy, and especially

when it is concerned about high levels of unemployment. Increasing the money stock usually decreases interest rates - which are the price of money paid by those who borrow funds to those who save and lend them. Lower interest rates encourage more investment spending by businesses, and more spending by households for houses, automobile, that are often financed by borrowing money. That additional spending increases national levels of production, employment, and income. However, the CBN must be very careful when increasing the money stock. If it does so when the economy is already operating close to full employment, the additional spending will increase only prices, not output and employment.

2.1.2 Impact of Injection and Withdrawal on Nigeria's Economic Growth Performance

The monetary policies adopted by the CBN can have dramatic effects on the national economy and, in particular, on financial markets. Most directly, of course, when the CBN increases the money supply and expands the availability of credit, then the interest rate, which determines the amount of money that borrowers pay for loans, is likely to decrease. Lower interest rates, in turn, will encourage businesses to borrow more money to invest in capital goods, and will stimulate households to borrow more money to purchase housing, automobiles, and other goods.

But the CBN can go too far in expanding the money supply. If the supply of money and credit grows much faster than the production of goods and services in the economy, then prices will increase, and the rate of inflation will rise. Inflation is a serious problem for those who live on fixed incomes, since the income of those individuals remains constant while the amount of goods and services they can purchase with their income decreases. Inflation may also hurt banks and other financial institutions that lend money, as well as savers. In a period of unanticipated inflation, as the value of money decreases in terms of what it will purchase, loans are repaid with naira that is worth less. The funds that people have saved are worth less, too.

When banks and savers anticipate higher inflation, they will try to protect themselves by demanding higher interest rates on loans and savings accounts. This will be especially true on long-term loans and savings deposits, if the higher inflation is considered likely to continue for many years. But higher interest rates create problems for borrowers and those who want to invest in capital goods.

If the supply of money and credit grows too slowly, however, then interest rates are again likely to rise, leading to decreased spending for capital investments and consumer durable goods (products designed for long-term use, such as television sets, refrigerators, and personal computers). Such decreased spending will hurt many businesses and may lead to a recession, an economic slowdown in which the national output of goods and services falls. When that happens, wages and salaries paid to individual workers will fall or grow more slowly, and some workers will be laid off, facing possibly long periods of unemployment.

For all of these reasons, bankers and other financial experts watch the CBN's actions with monetary policy very closely. There are regular reports in the media about policy changes made by the CBN, and even about statements made by CBN officials that may indicate a change in the supply of money and interest rates.

3 Research Methodology and Model Specification

In order to analyze the impact of injection and withdrawal of money stock on the growth of Nigeria's economy, there is need to specify an evaluating criterion. The ordinary least square method of simple regression models will be used to analyze the effect of the injection and withdrawal of money stock on Gross Domestic Product (GDP). The model will take a general form of the type below:

$$\ln Y = a_0 + \ln M_2 - \ln r + \mu$$

Y = gross domestic product (GDP)
A_0 = autonomous income
M_2 = money supply representing the total of demand deposits, time and savings deposit in the economy.
INT = interest rate
μ = error term

We estimated the equation with M_2 since M_2 provides better information than M_1. This is because M_2 is a combination of M_1 plus net time deposit and other large certificate of deposits. $M_2(X_1)$ and interest rate (X_2) represents injection and withdrawal. Analytical tools such as graphs will also be used to analyze the comparative growth rate between M_2 and GDP.

The growth in monetary aggregates exceeds its targets in most of the years. For instance, the broad (money M_2) increased by 21.5%, and 24.1%, compared with the growth targets of 15.3% and 15.0% in 2002 and 2003 respectively. Similarly, narrow money supply (M_1) grew by 15.9% and 29.5%, compared with the permissible targets of 12.4% and 13.8% in 2002 and 2003 respectively. The rapid expansion in aggregate money was influenced by the prevalence of excess liquidity in the banking sector, induced largely by the expansionary fiscal operation of the Federal and state governments and the growth in the net foreign assets. However, the expansion in M_2 and M_1 represented annualized growth rates of 12.0 and 8.4 per cent, which were within the programme target of 16.5 and 13.4 per cent, respectively, for fiscal 2005. This growth rates were within the targets due to restrictive fiscal and monetary policy of the government in the early part of the year.

Actually, inflation rate rose from 6.0% in 2001 to 12.9%, 14% and 15% in 2002, 2003 and 2004 respectively. High inflation rates were due to excess liquidity fuelled by the expansionary fiscal policy operations of the three tiers of government, depreciation of the naira and the increase in the pump-price of petroleum products which triggered higher costs in transportation and domestic production (CBN, 2003, P 32). However, inflation rates fell in the first quarter of 2005 due to the decrease in the Central Bank of Nigeria's (CBN) net claims on the Federal Government occasioned by the rise in government deposits with the Bank. It is a matter of perennial debate as to whether narrower or broader versions of the money supply as well as interest rate have a more predictable link to nominal GDP. A positive relation between the aggregates has been observed.

Dependent Variable: LOG(GDP)				
Method: Least Squares				
Date: 04/18/11 Time: 14:03				
Sample: 1970 2008				
Included observations: 39				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(INT)	0.024877	0.160421	0.155072	0.8776
LOG(M2)	0.983529	0.030840	31.89152	0.0000
C	1.540383	0.268142	5.744661	0.0000
R-squared	0.986041	Mean dependent var		12.66979
Adjusted R-squared	0.985266	S.D. dependent var		2.602483
S.E. of regression	0.315903	F-statistic		1271.506
Sum squared resid	3.592598	Prob(F-statistic)		0.000000
Log likelihood	-8.837226			
Durbin-Watson stat	0.412019			

4 Interpretation of Result

GDP= 1.54+0.98M_2 – (-0.02)INT+ μ

$GDP = 1.54 + 0.98M_2 + 0.02INT + \mu$

The regression analysis above indicates that the coefficient of money supply (M_2) is positive and significant at 1%. We could therefore deduce that M_2 has a positive impact on the performance of Nigerian economy. This implies that an increase/injection of money supply will result in an increase in the GDP. An increase in the GDP insinuates economic growth whereby, there is increase in output, income and employment and price over time. This would however lead to inflation. A one percentage in money supply to GDP will result in a 0.98 percentage unit change in the performance of the economy.

This outcome is that high interest rate stimulates supply of savings but high cost of borrowing discourages investment and retards growth in Nigeria. My final regression which has real interest rates as the response variable indicates that the significant determinant is real GDP. The findings imply that growth and development in an economy is influenced by the level of money supply.

Injection of money stock into the economy will lead to a reduction in interest rate which stands as a proxy for withdraw. A reduction in interest rate will however result in an increase investment which implies increase in output and income. An increase in interest rate will lead to a decrease in GDP.

The above analysis however shows a positive relationship between interest rate and GDP. That is one percentage change in interest rate brings about 0.024 percent unit change in GDP, ceteris paribus.

4.1 Measurement of Goodness Fit

The coefficient of multiple determinations R^2 is 0.98. This shows that about 98% of the total variations in GDP are explained by the variations in all the explanatory variables used in the model.

4.2 Trend Analysis

The graphs above show the contribution of M_1 and M_2 to GDP. It could therefore be deduced from the graphs that M_2 contributes more to GDP when compared to M_1. The graphs show that GDP increases as M_2 increases. Figure 3 gives a trend analysis of financial deepening. That is, M_2 as a percentage of GDP of which of course fluctuated over the years.

5.0 Conclusion and Recommendations

In conclusion, observation of the theoretical and empirical analysis indicates that, injection of money stock into the economy tends to reduce interest rate thereby increasing investment. An increase in investment will result in increase in output, employment, income and prices. It therefore implies that injection of money into the economy will bring about growth in the economic performance of Nigeria. It should however be noted that increase in employment and income will induce inflation. However, given the supply of money in the economy, a withdrawal or leakage this tends to reduce employment, income and prices thereby leading deflationary process in the economy.

On this basis, we provide the following recommendations. First, monetary policy should be more transparent to address the issue of expectations as inflation exhibits a high degree of inertia. Prior to 1986, the Nigerian government had a history of backtracking on reforms. This has created a situation where the public has no confidence in the government and policy announcements could not influence public expectations. Thus, CBN needs to address the issue of policy transparency. Transparency tends to lower inflationary expectations by providing an implicit commitment mechanism on the part of the central bank. This way policy will become more credible and the public can now form expectations that are closer to the policy targets.

Second, the buying and selling of securities in the open market operation (OMO) should be reconsidered. The use of OMO to stabilize price at the expense of output should be discouraged. The mopping of excess liquidity with the aim of stabilizing the economy has a negative impact on growth by raising lending rate and reducing investment.

Third, CBN needs to develop a strategic plan to deal with failing banks. It needs to strengthen its legal powers to close failing banks, and strengthen its capacity in supervision as a matter of urgency. The authorities are further urges to ensure that sound accounting standards are applied in valuing banks' assets. We calls also for progress in the legal processes for establishing asset management companies, since proper handling of failing banks' assets will be critical in order to minimize costs to the public sector if banks have to be closed.

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Figure 1. Showing Trends Relationship Between M1, M2 & GDP

Figure 1

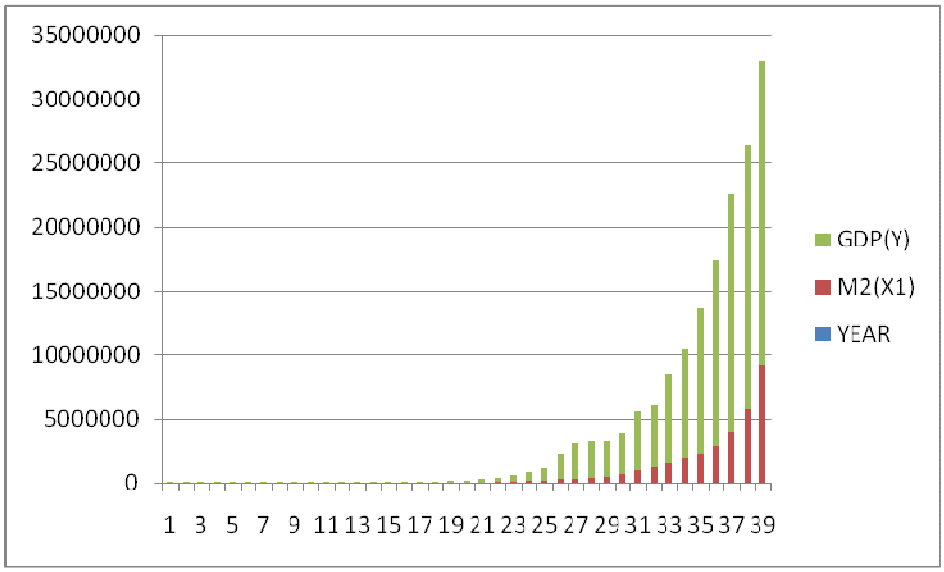

Figure 2

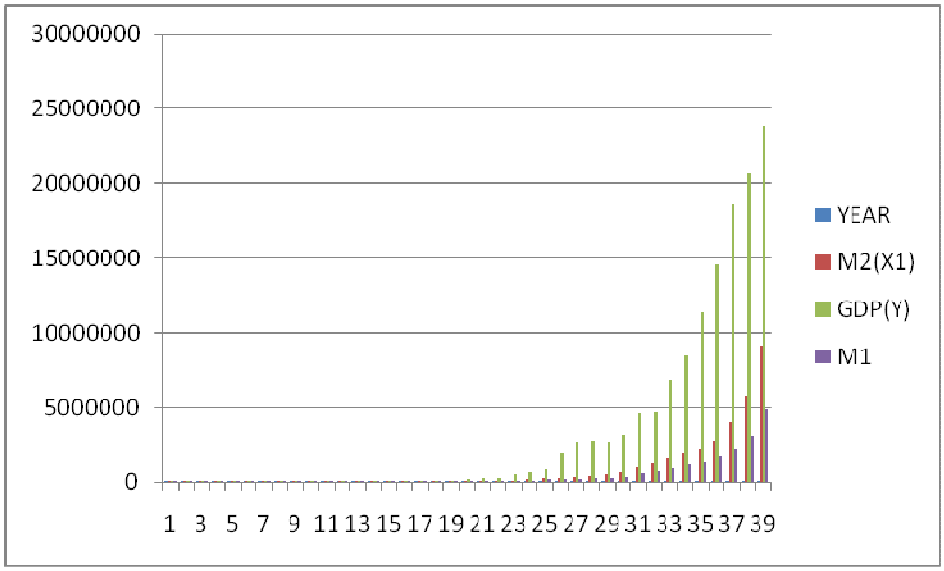

Figure 3

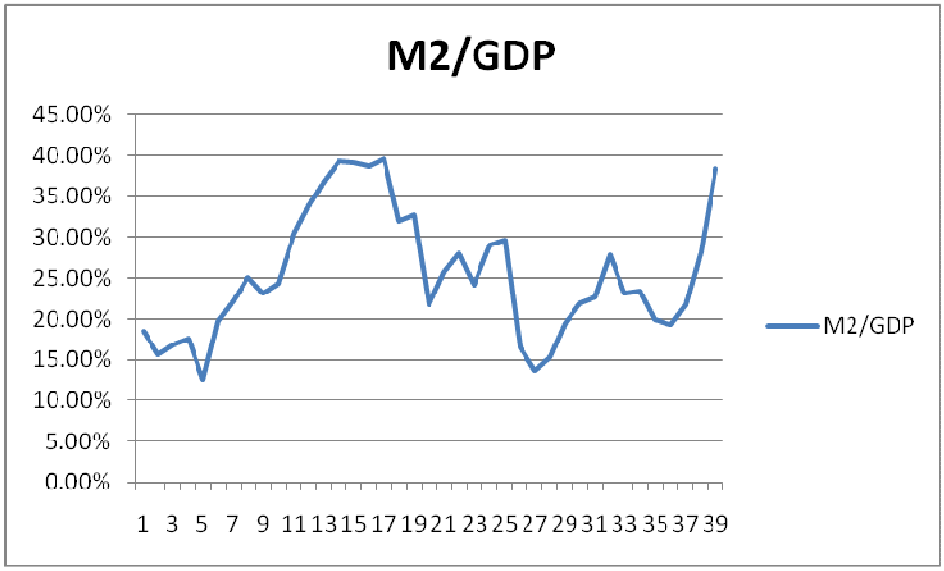

Table 1. Datasheet of Statistical Analysis

YEAR	M1	M2(X1)	INT R(X2)	GDP(Y)	%GRTH(M1)	%GRTH(M2)
1970	641.5	978.2	7	5281.1	0.00%	0
1971	670	1041.8	7	6650.9	4.44%	6.50%
1972	747.4	1214.9	7	7187.5	11.55%	16.62%
1973	925.8	1522.5	7	8630.5	23.87%	25.32%
1974	1357.2	2352.3	7	18823.1	46.60%	54.50%
1975	2605.4	4241.2	6	21475.2	91.97%	80.30%
1976	3864.1	5905.1	6	26655.8	48.31%	39.23%
1977	5557.8	7898.8	6	31520.3	43.83%	33.76%
1978	5260.7	7985.4	7	34540.1	-5.35%	1.10%
1979	6351.5	10224.6	7.5	41974.7	20.73%	28.04%
1980	9650.7	15100	7.5	49632.3	51.94%	47.68%
1981	9915.3	16161.7	7.75	47619.7	2.74%	7.03%
1982	10291.8	18093.6	10.25	49069.3	3.80%	11.95%
1983	11517.8	20879.1	10	53107.4	11.91%	15.39%
1984	12497.1	23370	12.5	59622.5	8.50%	11.93%
1985	13878	26277.6	9.25	67908.6	11.05%	12.44%
1986	13560.4	27389.8	10.5	69147	-2.29%	4.23%
1987	15195.7	33667.4	17.5	105222.8	12.06%	22.92%
1988	22232.1	45446.9	16.5	139085.3	46.31%	34.99%
1989	26268.8	47055	26.8	216797.5	18.16%	3.54%
1990	39156.2	68662.5	25.5	267550	49.06%	45.92%

1991	50071.7	87499.8	20.01	312139.7	27.88%	27.43%
1992	75970.3	129085.5	29.8	532613.8	51.72%	47.53%
1993	118753.4	198479.2	18.32	683869.8	56.32%	53.76%
1994	169391.5	266944.9	21	899863.2	42.64%	34.50%
1995	201414.5	318763.5	20.18	1933212	18.90%	19.41%
1996	227464.4	370333.5	19.74	2702719	12.93%	16.18%
1997	268622.9	429731.3	13.54	2801973	18.09%	16.04%
1998	318576	525637.8	18.29	2708431	18.60%	22.32%
1999	393078.8	699733.7	21.32	3194015	23.39%	33.12%
2000	637731.1	1036080	17.98	4582127	62.24%	48.07%
2001	816707.6	1315869	18.29	4725086	28.06%	27.00%
2002	946253.4	1599495	24.85	6912381	15.86%	21.55%
2003	1225559	1985192	20.71	8487032	29.52%	24.11%
2004	1330658	2263588	19.18	11411067	8.58%	14.02%
2005	1725396	2814846	17.95	14572239	29.66%	24.35%
2006	2280649	4027902	17.26	18564595	32.18%	43.09%
2007	3116272	5809827	16.49	20657325	36.64%	44.24%
2008	4857545	9167068	16.08	23842126	55.88%	57.79%