



The role of IMF in Pakistan's economy

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Abstract

This study examines “The role of IMF in the economy of Pakistan” over the period of 1974 to 2013. The results of the auto regressive distributed lag (ARDL) model has been used for examining the cointegration among the variables of the model and vector error correction model is used for short run dynamics of the models. ARDL bound testing approach show that there is cointegration among the variables of the model. The long run results show that the coefficient of GDP and political instability have negative and insignificant relationship with government borrowing. There is negative and significant relationship between IMF charges and government borrowing. Exchange rate has positive and significant relationship with government borrowing. Political instability is treated as dummy variable in model.

Keywords: GDP, Political Instability, Government Borrowing, Dummy Variable

JEL Codes: P47, H74

I. Introduction

Basically, the economies are focusing to understand and determine the indicators of economic growth. Numerous indicators affect the economic growth, whereas the developing countries have to face out not only the impact of their own policies on economy but also the affect and dictatorship of countries or financial institutions, providing borrowing and investment in such countries. Yet borrowing has to be done to finance public expenditure and for the social welfare of the economy. The developing countries like Pakistan have huge pressure of bad policies implemented by the financial assistance of IMF (International Monetary Fund). The International Monetary support was created in July 1944, originally with 45 members, with a goal to stabilize exchange rates and assist the modernization of the world's international payment system. Countries contributed to a pool which could be on loan from, on a temporary basis, by countries with expense imbalance (Condon, 2007). The IMF was important when it was first created because it helped the world stabilize the economic system. The IMF describes itself as "an organization of 186 countries (as of June 29, 2009), working to foster global monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and trim down dearth". With the exception of Taiwan (expelled in 1980), North Korea, Cuba (left in 1964), Andorra, Monaco, Liechtenstein, Tuvalu and Nauru, all UN member states participate directly in the IMF.

Pakistan became a member of the IMF in 1950 and the first time the Government of Pakistan opted for a loan from the IMF was in 1958. This was a Standby Agreement (SBA) amounting to USD 25 Million. However, due to political disturbance, this loan was cancelled soon after. Pakistan received its second and third SBAs in 1965 and 1968, during Field Marshal Ayub Khan's era. As observed by Barro and Lee (2002) Pakistan was among the five developing countries which had the highest number of professional staff at the IMF in 1999. Birdsall and Diwan (2003) show that countries with higher debt, especially those indebted to international organizations, have indeed received larger net transfers than other countries. Based on the data on external debt and resource flows to Pakistan, it appears that Pakistan's debt stock has grown very rapidly in the last three decades. As the IMF is often depicted as a heartless moneylender which forces poor countries to adopt bad policies and take its 'pound of flesh' back while the countries sink further into poverty. Mainly, in case of Pakistan when we want to measure and check the effect of policies and conditions of financial institutions as well as Govt. borrowing decisions, not direct policies of Pakistan can measure the growth and other external indicators of IMF's policies on taxation system exchange rate, borrowing decisions, GDP growth, imports and exports quota's, tariffs IMF purchases are also affected.

Basically the economy's growth is measured by its GDP. So in this research paper GDP has been taken to check the Economy of Pakistan. Here the research is going to analyse. The Role of IMF in the Pakistan's economy but as being a developing country Pakistan does not any control on IMF's policies and data on IMF is not available, so its limitation for this research that's why it's proxy has been used as Government borrowing. The purpose of this research is to check and elaborate the relation of IMF charges with Government borrowing and the variables related to it. The organization of study as follows: section 2 presents review of literature. Theory and econometric methodology are presented in section 3. Empirical results and discussion are given in section 4. The final section concludes the study.

II. Literature review

IMF funding has been one of the most debated issues from the last few years in terms of its policies, restrictions and its impact on the economy of countries under IMF programs. A number of studies have been done in this regard. However, the results of these studies are contradicting making this issue still debatable. The most studied determinants explaining the role of IMF on different economies including Pakistan are exchange rate , political instability, gross domestic product, foreign direct investment, external debt, government borrowing, inflation and IMF charges. some of the main and relevant studies are given here. Atique and Malik (2012) examines the determinants of economic growth for Pakistan, the impact of domestic debt and external debt on the economic growth of Pakistan separately over period of 1980 to 2010, using Ordinary Least Square (OLS) approach to Cointegration, Unit Root Testing, Serial Correlation Testing, test for checking Heteroscedasticity and CUSUM test of stability. The findings suggested an inverse relationship between domestic debt and economic growth and also the relationship between external debt and economic growth was found to be inverse. These relationships were found to be significant as well. The results also concluded that external debt amount slows down economic growth more as compared to domestic debt amount. The negative effect of external debt is stronger on the economic growth in comparison to domestic debt. Some policy implications for coming out of debt overhang scenario are also presented. Doug Bandow (1999) argues that the existence of IMF bailouts creates a moral hazard problem that encourages countries to not solve their fundamental problems. He suggests that all nations would benefit if healthy economies

"quarantined" sick economies instead of providing economic assistance. Bandow argues that IMF assistance programs increase risk for healthy economies and do not provide long-term benefits for troubled economies. He notes that most IMF borrowers have received aid for a decade or more.

A number of researchers like Dicks Mireaux (2000), who has found strongly positive economic growth effects of IMF funding. These researchers found that there is appositive impact of IMF funding on the economy. While there are also studies which concluded that are no significant effects of IMF on the economy of a country under IMF agreement like, Hardoy (2003) and Hutchison (2004), who argue that IMF funding does not pour any significant impact on the economy of the borrower country. Nunnenkamp (1999) in his article discussed that IMF is under serious attack as critics blame that IMF lending lead to financial crisis and suggests to stop IMF funding also the researcher discussed the consequences of ending the lending. The estimates of Barro & Lee (2005) shows that a higher IMF loan-participation rate reduces economic growth.

O'Driscoll (1997) in his article has conducted the descriptive research about the IMF policies towards developing countries by keeping the focus on USA economy. The Policy making of IMF for the developing countries are without any backing of historical decisions taken by the developing countries in past. Thus the financial crises and current account deficit crises is mainly attributed to such policy making. The researcher has given example of Asia in which case the above discussion is particularly true which roots in 1995. The IMF's handling of the Mexico crisis firmly established moral hazard in international lending and sowed the seeds for the Asian crisis. Thus far, IMF policy in Asia largely repeats the policy mistakes in Mexico. Gina (2007) indicates in his article that the reforms enacted by Congress in USA are an important first step toward reforming the IMF. Even more important than the reforms, however, was the congressional debate over IMF funding. That debate focused attention on the process and Substance of IMF policymaking and even questioned the need for that organization in the post-Bretton Woods world.

Przeworski and Vreeland (2000) Using a bivariate, dynamic version of the Heckman selection model, they estimate the effect of participation in International Monetary Fund IMF programs on economic growth. They find evidence that governments enter into agreements with the IMF under the pressures of a foreign reserves crisis but they also bring in the Fund to shield themselves from the political costs of adjustment policies. Program participation lowers growth rates for as long as countries remain under a program. Once countries leave the program, they grow faster than if they had remained, but not faster than they would have without participation.

III. Economic Model and Econometric Methodology

$$GOVBORR = f(POP, GDP, IMFCH, EXRT, PINS)$$

GOVBORR= Government Borrowing

POP = Population

IMFCH = International Monetary Fund Charges

GDP = Gross Domestic Product

EXRT = Exchange Rate

PINS= Political Instability

Following the long linear form of the function the model becomes as:

$$LGOVBORR = \alpha_0 + \alpha_1 LPOP + \alpha_2 LIMFCH + \alpha_3 PINS + \alpha_4 LGDP + \alpha_5 LEXRT$$

Political instability is used as a dummy variable.

1= Military Dictatorship, 0= otherwise

The main objective of this study is to analyze "The role of IMF in Pakistan economy" from 1974 to 2013. The data for all variables is taken from Pakistan economic survey and world development indicators database maintained by World Bank.

Dickey and fuller (1981) purposes the augmented Dickey-Fuller (ADF). The general forms of the ADF can be written as:

$$\Delta X_t = \delta X_{t-1} + \sum_{j=1}^q \phi_j \Delta X_{t-j} + e_{1t}$$

$$\Delta X_t = \alpha + \delta X_{t-1} + \sum_{j=1}^q \phi_j \Delta X_{t-j} + e_{2t}$$

$$\Delta X_t = \alpha + \beta t + \delta X_{t-1} + \sum_{j=1}^q \phi_j \Delta X_{t-j} + e_{3t}$$

X_t is a time series for testing unit roots, t is the time trend and e_t is error term having white noise properties. If $j=0$, it represents the simple DF test. The lagged dependent variables in the ADF in the area regression equation are included until the error term becomes white noise. For checking the serial correlation of error terms LM test is used the null and alternative hypothesis of ADF unit roots are:

H0: $\delta = 0$ non-stationary time series; so it has unit root problem.

Ha: $\delta < 0$ stationary time series.

Applying OLS and computing τ statistic of the estimated coefficient of X_{t-1} and comparing it with the Dickey Fuller (1979) critical τ values, if the calculated value of τ statistic is greater than the critical value then reject the H0. In this case the time series data is stationary. On the other hand, if we fail to reject H0, the series is non-stationary. In this way by applying this procedure on all variables, we can easily find their respective orders of integration.

In literature, a number of cointegration tests for econometric analysis are available. Most famous and traditional cointegration tests are the residual based Engle-Granger (1987) test, Maximum Likelihood based on Johansen (1991/1992) and Johansen-Juselius (1990) tests. One thing common in these tests is that they require same order of integration for their analysis. These cointegration tests become invalid and inefficient when the variables of the model have different level of integration. Moreover, the analysis based on these tests of cointegration do not provide information about the structural breaks of time series data and also have low power of prediction. With the passage of time structural changes have occurred in time series such as economic crises, new institutional arrangements and changes in policy regime. The problem with these traditional methods is that the testing of the null hypothesis of structural stability against the alternative of a one-time structural break only. If such structural changes are present in the data generating process, but not allowed for in the specification of an econometric model, results may be biased. ARDL bound testing approach presented by Pesaran and Pesaran (1997), Pesaran and Shin (1999), and Pesaran, Shin and Smith (2001) has numerous advantages over traditional methods of cointegration. Firstly, ARDL can be applied regardless of the order of integration. Secondly, ARDL bounds testing approach to cointegration can be used for small sample size (Mah, 2000). Thirdly, this approach allows taking sufficient number of lags for capturing the data generating process in a general to specific modeling framework (Laurenceson et al., 2003). Lastly, ARDL gives efficient and valid detailed information about the structural breaks in data. This technique is based on Unrestricted Vector Error Correction Model (UVECM) which has better properties for short and long-run equilibrium as compared to traditional techniques (Pattichis, 1999). Pesaran and Shin (1997) and later on Pesaran et al. (2001) mention that under certain environment long-run correlation among macroeconomic variables can be found with the help of Autoregressive Distributive Lag Model (ARDL). After lag order selection for ARDL procedure, simply OLS can be used for identification and estimation. Valid estimates and inferences can be drawn through the presence of unique long-run alliance that is crucial for cointegration.

$$\Delta \ln Y_t = \beta_1 + \beta_2 t + \beta_3 \ln Y_{t-1} + \beta_4 \ln X_{t-1} + \beta_5 \ln Z_{t-1} + \dots + \sum_{h=1}^p \beta_h \Delta \ln Y_{t-h} + \sum_{j=0}^p \gamma_j \Delta \ln X_{t-j}$$

$$+ \sum_{k=0}^p \phi_k \Delta \ln Z_{t-k} + \dots + u_{it}$$

At first the study will find the direction of relationship among the variables in case of Pakistan by applying the bounds test using Wald test. This study uses different proxies for social progress as dependent variable and every model has different control variable with macroeconomic instability.

H0: $\beta_3 = \beta_4 = \beta_5 = 0$ (no cointegration among the variables)

HA: $\beta_3 \neq \beta_4 \neq \beta_5 \neq 0$ (cointegration among variables)

If there exists long-run cointegration relationship among the variables, then for finding short-run relationship the study uses the Vector Error Correction Model (VECM). The VECM is explained as under:

$$\Delta \ln Y_{it} = \beta_1 + \beta_2 t + \sum_{h=1}^p \beta_h \Delta \ln Y_{it-h} + \sum_{j=0}^p \gamma_j \Delta \ln X_{t-j} + \sum_{k=0}^p \phi_k \Delta \ln Z_{it-k} + \omega ECT_{t-1} + u_t$$

IV. Empirical Results and Discussions

For over viewing the temporal properties of data the descriptive statistics is presented in table 1. The values of Jarque-Bera show that all the variables of the model have zero mean and finite covariance; this confirms that selected data sets are normally distributed. The result shows that all variables have positive kurtosis.

TABLE 1
Descriptive statistics

	LOGGOVBORR	LOGGDP	LOGIMFCH	LOGEXRT	PINS	LOGPOP
Mean	4.233888	0.637725	7.627331	1.459228	0.525000	0.414110
Median	4.293862	0.684806	7.563108	1.467032	1.000000	0.406809
Maximum	4.668777	1.009268	8.249819	2.007017	1.000000	0.524283
Minimum	3.646110	0.006208	6.697229	0.995635	0.000000	0.307027
Std. Dev.	0.295540	0.222474	0.315520	0.343950	0.505736	0.080662
Skewness	-0.255072	-0.818081	-0.384468	-0.031063	-0.100125	-0.019644
Kurtosis	1.966317	3.379986	3.702274	1.564787	1.010025	1.425193
Jarque-Bera	2.214580	4.702361	1.807420	3.439495	6.666834	4.135932
Probability	0.330453	0.095257	0.405064	0.179111	0.035671	0.126443
Sum	169.3555	25.50901	305.0933	58.36912	21.00000	16.56441
Sum Sq. Dev.	3.406410	1.930285	3.882562	4.613766	9.975000	0.253750
Observations	40	40	40	40	40	40

TABLE 2
Pair wise correlation

	LOGGOVBORR	LOGGDP	LOGIMFCH	LOGEXRT	PINS	LOGPOP
LOGGOVBORR	1.000000					
LOGGDP	-0.405823	1.000000				
	-2.737193	-----				
	0.0094	-----				
LOGIMFCH	0.237961	-0.028634	1.000000			
	1.510273	-0.176582	-----			
	0.1392	0.8608	-----			
LOGEXRT	0.977329	-0.463003	0.187845	1.000000		
	28.45510	-3.220079	1.178938	-----		
	0.0000	0.0026	0.2458	-----		
PINS	-0.074263	0.410740	-0.040108	-0.102874	1.000000	
	-0.459057	2.777038	-0.247442	-0.637543	-----	
	0.6488	0.0085	0.8059	0.5276	-----	
LOGPOP	-0.880484	0.449511	0.091989	-0.934678	0.110808	1.000000
	-11.44897	3.102035	0.569470	-16.20766	0.687297	-----
	0.0000	0.0036	0.5724	0.0000	0.4961	-----

Table 2 reports the correlation matrix of variables the results reveals that government borrowing (LOGGOVBORR) has positive and significant correlation with IMF charges (LOGIMFCH) and exchange rate (LOGEXRT) whereas it has negative and significant correlation with GDP (LOGGDP) and population (LOGPOP). It has negative and insignificant correlation with political instability (PINS) but we ignore this because we treat political instability as a dummy variable. The results of the correlation matrix show there is no problem of multicollinearity among the explanatory variables.

Table 3
Estimated results of unit root test

VARIABLES	ARDL
LOGGOVBORR	-4.064
LOGGDP	-4.111
LOGIMFCH	-3.661
LOGEXRT	-3.068
LOGPOP	-3.631
PINS	-7.552

The results of unit root test of log Govt. borrowing model is reported in table 3. the results of ADF shows Govt. borrowing, population, gross domestic product, exchange rate, political instability are stationary at first difference. IMF charges is stationary at level. Because there is a mixture of integration which is suitable condition for applying ARDL cointegrations approach. For investigating the cointegration among government borrowing, GDP, IMF charges, exchange rate, political instability and population ARDL Bounds testing approach is used. The results of ARDL Bounds testing approach are presented below in table. The calculated F-Statistics (4.017) is greater than the upper bound value of Pesaran, Shin and Smith (2001) at 5% and 10%. The calculated F-Statistics has verified that Cointegration exists among the variables of the model.

Table 4
ARDL Bound Testing Approach
Dependent Variable: Government Borrowing, ARDL(1,0,1,1,1,1)

Critical value	F-statistics 4.017	
	Lower bound	Upper bound
95%	2.62	3.79
90%	2.26	3.35

Long run relationship among the government borrowing, GDP, population, political instability, exchange rate and IMF charges can be examined. The coefficient of GDP (LOGGDP) shows that there is negative and insignificant relationship between government borrowings (LOGGOVBORR) and GDP (LOGGDP). The results show 1 percent increase in GDP creates 0.052201 percent decrease in government borrowing. There is negative and significant relationship between IMF charges and government borrowing. The estimated result shows 1 percent increase in IMF charges creates 0.3764 percent decrease in government borrowing. Exchange rate has positive and significant relationship with government borrowing. It means that 1 percent increase in exchange rate creates 1.638822 percent increase in government borrowing. Political instability is treated as dummy variable in this model. Population has positive and significant relationship with government borrowing. The results reveal that 1 percent increase in population brings 4.008844 percent increase in government borrowing. This shows that for reducing government borrowing government should be increase GDP and IMF charges and reduce population rate and exchange rate.

TABLE 5
Estimated Long Run Coefficients Using the ARDL Approach
Dependent Variable: GOVERNMENT BORROWING, ARDL(1,0,1,1,1,1)
Time Period 1974-2013

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGGDP	-0.052201	0.084357	-0.618806	0.5414
LOGIMFCH	-0.376430	0.132208	-2.847256	0.0085
LOGEXRT	1.638822	0.325467	5.035295	0.0000
PINS	-0.025019	0.031261	-0.800333	0.4308
LOGPOP	4.008844	1.445104	2.774088	0.0101
C	3.265174	0.682349	4.785196	0.0001

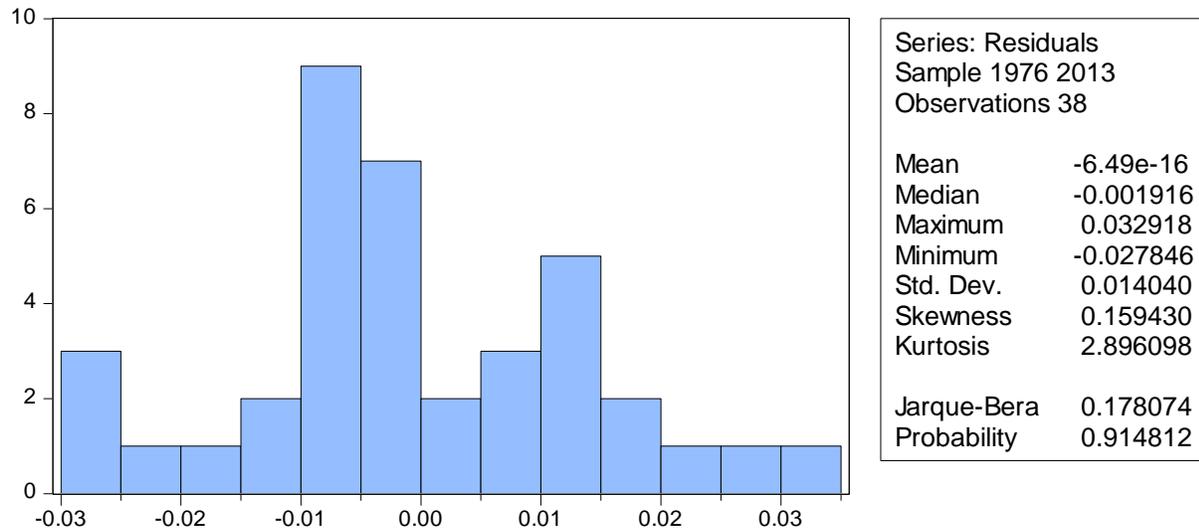
The short run dynamics presented in table 6, the study uses vector error-correction model (VECM) for investigating the short run dynamic among government borrowing, GDP, IMF charges, exchange rate, population and political instability. The negative and significant coefficient (-0.208) of ECM is theoretically correct. The negative and significant value of ECM shows the speed of adjustment from short run to long run equilibrium. The estimates of ECM reveals that short run needs 4 years and 8 months to converge in the long run equilibrium.

Table 6
Error Correction Representation
ARDL(1,0,1,1,1)
Dependent Variable : Government Borrowing
Time Period 1974-2013

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGGDP)	-0.010898	0.016663	-0.654018	0.5188
D(LOGIMFCH)	-0.019492	0.017061	-1.142436	0.2637
D(LOGEXRT)	-0.079953	0.167618	-0.476995	0.6374
D(PINS)	0.011211	0.011021	1.017289	0.3184
D(LOGPOP)	3.576326	1.705551	2.096874	0.0459
D(LOGPOP(-1))	-2.625270	1.383007	-1.898234	0.0688
CointEq(-1)	-0.208765	0.076539	-2.727556	0.0113

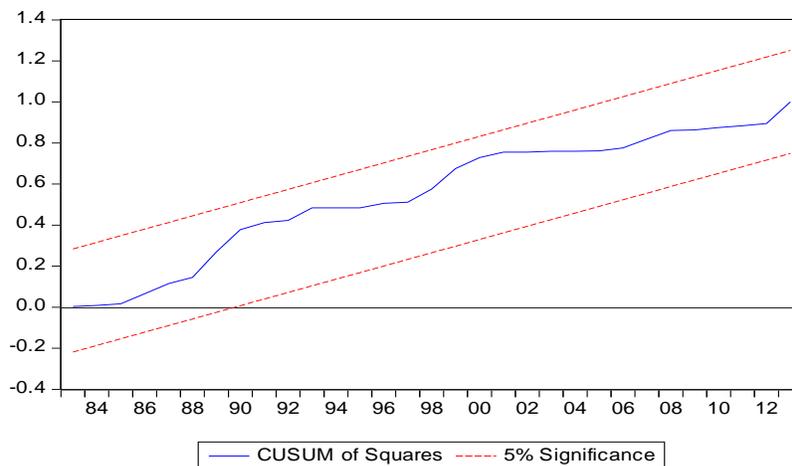
Cointeq = LOGGOVBORR - (-0.0522*LOGGDP -0.3764*LOGIMFCH + 1.6388*LOGEXRT -0.0250*PINS + 4.0088*LOGPOP + 3.2652)

The estimated results of diagnostic tests are shown in table. The estimated results of Lagrange multiplier test of residual serial correlation show that there is no serial correlation among the variables of the model. Ramsey's RESET test using the square of the fitted values shows that the model has the correct functional form. Normality based on Skewness and Kurtosis explains that the time series data of all variables is normally distributed. The results show that there is no problem of Heteroscedasticity.



Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.321523	Prob. F(2,24)	0.2854
Obs*R-squared	3.769679	Prob. Chi-Square(2)	0.1519
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.883116	Prob. F(11,26)	0.5673
Obs*R-squared	10.33599	Prob. Chi-Square(11)	0.5004
Scaled explained SS	4.587357	Prob. Chi-Square(11)	0.9495

The stability of model provides information regarding the estimated model of government borrowing has been shifted or not over time. The result of cumulative sum of squares is reported in figure below. This figure shows that cumulative sum of squares lies between the two critical lines which shows that estimated model is stable.



V. Conclusions

In this paper we have investigated the role of IMF in Pakistan's economy. For this research purpose the data has been taken from 1974 to 2013. The results of the ARDL bound testing approach show that there is cointegration among the variables of the model. The results show that the coefficient of GDP indicates that there is negative and insignificant relationship between government borrowings and GDP. There is negative and significant relationship between IMF charges and government borrowing. Exchange rate has positive and significant relationship with government borrowing. Political instability is treated as dummy variable in this model. The political instability has negative and insignificant relationship with government borrowing. Population has positive and significant relationship with government borrowing. The negative and significant coefficient of ECM is theoretically correct. The negative and significant value of ECM shows the speed of adjustment from short run to long run equilibrium. The estimates of ECM reveals that short run needs 4 years and 8 months to converge in the long run equilibrium. The diagnostic tests result reveal that there is no serial correlation, heteroscedasticity and model has correct functional form with normally distributed data. The study concludes that the Government has to play its role in increasing the pace of economic growth in Pakistan. For reducing the level of borrowing government should increase the GDP and IMF charges and decreases the exchange rate and population.

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