

Explaining the Case of Icelandic Currency Crisis

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ABSTRACT

This paper tries to explain the recent currency crisis in Iceland and draw some policy lessons. It shows that the recent currency crisis in Iceland is mainly due to a loose monetary policy preceding the crisis. Structural reforms which could have prevented the occurrence of the crisis were missing. We choose to explain the crisis using a least squares method where a set of fundamental per capita, real sector and institutional variables are combined and compared to the Euro zone ones in order to explain the November 2008 turbulence. The results show that the 2008 credit crunch in us economy was relevant to the crisis in Iceland joined by the fundamentals of the country's economy was the reason for this inconvenience.

Keywords: *Currency crises, Nordic economies, contagion.*

1. INTRODUCTION

This paper is trying to explain the factors that were behind the recent currency crisis in Iceland and then draw some policy lessons for the Greek economy. Iceland used to be one of the most developed countries world-wide with a GDP per capita reaching 33,000 USD in 2005.ⁱ The country was also the fourth most productive country world-wide during the same period. It was named as the "Nordic Tiger" because of similarities with the Asian tigers in the '90s. But unfortunately, her fate was not the same. From 2006 and onwards, the economy faced severe problems of growing inflation and current deficits partly in response to the rapid expansion of the financial system before its total collapse in 2008. Iceland had to obtain emergency funding from the International Monetary Fund and from a range of European countries in November 2008.

The paper is structured as follows: the second part makes a historical overview of the Icelandic crisis and its remedy, whereas section 3 presents the model of financial crisis and its estimation. Finally, the fourth part draws some policy lessons and offers some concluding remarks.

2. THE FACTS OF THE CRISIS

The accumulation of foreign companies in Iceland was financed by loaning expansion from the interbank lending market and deposits outside Iceland (another form of external debt).ⁱⁱ It was estimated that the three major banks hold foreign debt in excess of €50 billion. Many foreign investors since January had feared a plausible default and wondered if the government could guarantee their investment. The central bank of the country on March 2008 had to face a deposit insurance of 6-8.5% of the sum deposited, far higher than other European Banks. Country's national currency Krona was named as the most over valued currency, in real terms, in the world, based on the Economist's Big Mac Index. Consumer debt was also high, equivalent to 213 % of the personal disposable income. This figure was exacerbated by the practice of the central bank to issue liquidity loans in uncovered basis and printing money on demand. At the end of the second quarter 2008, the external debt was 9,500 billion kronas or 50 billion euros, more than 80 % of which was held by the banking sector. The same

number for the second quarter of 2007 was 1,293 billion kronas or 8.5 billion euros.

The Icelandic krona had declined more than 35 % against Euro within the first nine months of 2008. In response to large inflation (and out of its proposed target of 2.5 %), the central bank of Iceland held its interest rates at extremely high levels of 15.5%. The spread between Icelandic British and European interest rate was 10 and 11.5 percentage points respectively, encouraging overseas investors to hold deposits in the country's banks. The broad money supply (M3) grew at 37.8 % within the first eight months of 2008, compared to a GDP grow of 5 %. The situation was effectively an economic bubble with some investors overestimating the real value of Krona. The global financial crisis begun in the USA and the international liquidity was reduced. The Icelandic central bank kept interest rates high until the collapse.

In September 2008, one of the three major commercial Icelandic banks, the Glitnir bank had been proposed to be nationalized. The following week, the second largest bank of the country, Landsbanki and Glitnir handed over to the receivers appointed by the Financial Supervisory Authority (FME). Shortly afterwards, the largest bank of Iceland, Kaupthing was also placed in to receivership. The government believed that this was the proper action to save the country from bankruptcy. The assets of the three banks controlled by FME totaled 14,437 on receivership time.

On September 29th 2008, the financial rescue plan for the Glitnir bank was announced. The government planned to purchase a 75 % share for 600 million Euros. The government did not intend to hold the ownership of the bank for a long time, and it planned to continue its operation after few weeks. Later, FME found that the bank had short term debts of 750 dollars mature on October 15th and preceded the receivership. The announcement of the nationalization of Glitnir came just as the United Kingdom forced to nationalize Bradford & Bingley.

Over the following weekend, British newspapers analyzed the nationalization processes in

<http://www.ejournalofbusiness.org>

Iceland and the high leverage of Icelandic banks. Major concern had to do with Kaupthing bank who had branches in the UK and the Netherlands. Guardian noted that Iceland was on the brink of collapse. In online forums many people started to move savings out of the bank through internet. The website had problem in access after some run of savings.

On Monday October 6th, private interbank credit facilities to Icelandic banks were shut down. Government took new regulatory measures. FME took the control of the Icelandic banks without nationalizing them and proposed aid to help bank liquidations. In a separate measure, the government fully guaranteed the deposits in Icelandic banks. In the evening of the same day, a subsidiary of Landsbanki went into voluntary administration. The central bank decided to peg the Krona to euro at a 131 to 1 rate.

On October 7th, Landsbanki was put in receivership. All its branches were stated by FME. Its subsidiary in UK started to transfer its assets to a treasury holding company and then sold them to the ING group. The same afternoon there was a call between Icelandic finance minister and his UK colleague, and the first one said that the Icelandic state wasn't intend to pay its debts to the UK. The government began formal talks with Russia, in order to receive a €4 billion loan. The loan has been programmed in four years-payments with interest rate 30 or 50 points over LIBOR.ⁱⁱⁱ The government admitted that the opening of negotiations for loan within summer.

The next day, Wednesday October 8th, the UK government froze the assets of Landsbanki and the Icelandic government in the UK. The freezing order implied the antiterrorism and security Act (2001). Gordon Brown seeks for a remedy for 300,000 UK investors in Iceland. The Icelandic government became outraged from the antiterrorism law. The total amount of Icelandic assets frozen reached £ 4 billion. The UK government branch FSA (Financial Service Authority) also set Kaupthing bank to default on obligations. Over than £ 2.5 billion deposits were sold to the ING group. The bank of England provided a secure loan to the bank to help maximize returns on UK creditors. On the other hand, the Swedish government made credit facility of € 520 million to Kaupthing bank, in order to pay its obligations. The same night Icelandic central bank abandoned the peg against Euro.

Within the next day of the currency collapse, the trading rate climbed on 340 Krona per Euro, because Kaupthing placed in to receivership. The bank said that it was a technical default due to UK subsidiary. The Luxemburg subsidiary received a suspension of payments in the Luxemburg District Court. The Geneva branch prevented from making any payments more than 5,000 Swiss francs. The government closed the stock market for two days. This decision was made due to

unusual market conditions of 30% average falling from the start of the month.

An early agreement was made on October 11th between the Icelandic and the Dutch government, on the saves of 120,000 Dutch citizens, held by Landsbanki Dutch subsidiary, using money lent from the Dutch government. The amount of these deposits was approximately €1.7 billion.

On the heat of the crisis the four main credit rating agents which monitored the Iceland's sovereign debt changed their ratings to negative, because they believed that the country had to issue more foreign currency bonds, both to cover losses as the banks' overseas operations were liquidated, and to stimulate domestic demand as Iceland went to recession.

The Stock exchange did not open on Monday (October 13th) because of the news that a Norwegian subsidiary of Kaupthing was taken under the control of the Norwegian government including all its assets. The market re-opened on 14th October with the main index losing 78% of its value in the last Friday and 96% of its value compared to the historic high of 18th July of 2007.

A team of Icelandic negotiators was sent to Moscow on Tuesday the 14th in order to discuss the proposed loan. At the same time the central bank drew its swap facilities in Norway and Denmark for € 200 million each, and seeks additional help from European Central Bank. In the domestic field, the central bank set up a temporary system of daily currency auctions on October 15th in order to facilitate the international trade. The value of Krona was determined by supply and demand in these auctions. The system worked till October the 28th when trading outside Iceland was permitted at the 240 to 1 exchange rate, and the interest rate rose to 18%.

The FME began the restructuring of the Icelandic Banks within the first day of their receivership. New Landsbanki (200 billion Krona in Equity and 2,300 billion in assets) was set up on October 9th, new Glinir on October 16th (110 Billion Krona equity and 1,200 billion assets) and new Kaupthing was set up on October 22nd with 75 billion Krona equity, and 700 billion in assets. The pension funds had major cuts within October. The equity supplied was 30% of Iceland's' GDP. The total debt that they inherited was equal to 90% of Iceland's' 2007 GDP. More than 2,136 bank clerks lost their jobs within 2008.

The cost of restructuring the bank sector was not the only short term cost that the government had to face. The private Sterling Airlines Company declared bankruptcy on October the 29th, the national air transport company Iceland air has noticed significant slump in demand for flights. Newspapers and other media corporations made job cuts. The inflation rate climbed as high as 75% at the end of the year.

On October 24th, the IMF agreed to loan €1.58 million, but Iceland did not secure the necessary loans till the end of month. Finally, on November 19th, the IMF loaned a \$ 4.6 billion followed by \$ 2000 million from Poland, \$ 50 million from Faroe Islands, \$ 300 million from Russia and a joint loan worth of \$ 6.3 billion from Germany, the Netherlands and the UK.

3. VARIABLES, DATASET MODEL AND RESULTS

The variables used in the analysis are chosen in light of theoretical considerations and empirical determinants of crises. We apply a set of variables that have been proved useful by a large number of empirical studies. In order to enhance the possibility of identifying the crisis factors, the process of evaluating the model applies eight variables, grouped into four categories: variables related to monetary policy, to the external sector, to contagion and specific institutional variables. The data sources are the International Financial Statistics, the bank of Iceland and the Heritage foundation. Data frequency is monthly for an eleven year period (January 1999- July 2010) with the exception of Economic Freedom index which is annual. The variables included in our model and their economic justification of the choice of the variables to be applied is as following:

Feasible generalized least squares (FGLS or Feasible GLS) is a regression technique. It is similar to generalized least squares except that it uses an estimated variance-covariance matrix since the true matrix is not known directly. The following description follows loosely the references presented in Heteroscedasticity-consistent standard errors. The dataset is assumed to be represented by:

$$y = X\beta + u,$$

Where X is the design matrix and β is a column vector of parameters to be estimated. The residuals in the vector u, are not assumed to have equal variances: instead the assumptions are that they are uncorrelated but with different unknown variances. These assumptions together are represented by the assumption that the residual vector has a diagonal covariance matrix

Ordinary Least Squares estimation can be applied to a linear system with heteroskedastic errors, but OLS in this case is not Best Linear Unbiased Estimator (BLUE). To estimate the error variance-covariance matrix, the following process can be iterated: The ordinary least squares (OLS) estimator is calculated as usual by:

$$\hat{\beta}_{OLS} = (X'X)^{-1}X'y$$

And estimates of the residuals \hat{u}_j are constructed.

Construct $\hat{\Omega}_{OLS}$:

$$\hat{\Omega}_{OLS} = \text{diag}(\hat{u}_1^2, \hat{u}_2^2, \dots, \hat{u}_n^2).$$

Estimate $\hat{\beta}_{FGLS1}$ using $\hat{\Omega}_{OLS}$ using weighted least squares

$$\hat{\beta}_{FGLS1} = (X'\hat{\Omega}_{OLS}^{-1}X)^{-1}X'\hat{\Omega}_{OLS}^{-1}y$$

$$\hat{u}_{FGLS1} = Y - X\hat{\beta}_{FGLS1}$$

$$\hat{\Omega}_{FGLS1} = \text{diag}(\hat{u}_{FGLS1,1}^2, \hat{u}_{FGLS1,2}^2, \dots, \hat{u}_{FGLS1,n}^2)$$

$$\hat{\beta}_{FGLS2} = (X'\hat{\Omega}_{FGLS1}^{-1}X)^{-1}X'\hat{\Omega}_{FGLS1}^{-1}y$$

This estimation of $\hat{\Omega}$ can be iterated to convergence given that the assumptions outlined in White hold.

Estimations from WLS and FGLS are as follows:

$$\hat{\beta}_{WLS} \sim N(\beta, (X'\Omega^{-1}X)^{-1})$$

$$\hat{\beta}_{FGLS} \sim N(\beta, (X'\hat{\Omega}_{OLS}^{-1}X)^{-1}(X'\hat{\Omega}_{OLS}^{-1}\hat{\Omega}_{OLS}^{-1}X)(X'\hat{\Omega}_{OLS}^{-1}X)^{-1})$$

The variables used in the analysis are chosen in light of theoretical considerations and empirical determinants of crises. We apply a set of variables that have been proved useful by a large number of empirical studies. In order to enhance the possibility of identifying the crisis factors, the process of evaluating the model applies ten variables, grouped into four categories: variables related to monetary policy, to the external sector, to contagion and specific institutional variables. The data sources are the International Financial Statistics, the bank of Hungary and the Heritage foundation. Data frequency is monthly with the exception of Economic Freedom index which is annual. The variables included in our model and their economic justification of the choice of the variables to be applied is as following:

3.1 Variables Related To Monetary Policy

a. Real Exchange Rate

The Real Effective Exchange Rate of the national currency given by IMF or by calculation of the real exchange rates of major trading partners, against national currency, weighted by their participation. REER is a measure of competitiveness. A decline of REER (overvaluation) has negative effect on competitiveness and vice versa. The choice of this variable was established by Kaminsky, Lizondo and Reinhart (1998)^{iv} and Kemme and Roy (2005)^v. According to them, the real exchange rate is overvalued relative to its equilibrium level or its average level during tranquil times, in periods preceding the currency crash.

Therefore, we establish a negative relation between this variable and the incidence of a crisis.

b. International Reserves

Foreign exchange reserves expressed in USD. All the past theoretical or empirical models used this fundamental as the main (and before first generation models the only) measure of crisis likelihood. It is clear that the lower reserves are, the higher the probability of speculative attacks and currency crisis (negative effect). We should note, however, that the central bank can also keep other reserves beyond foreign exchange (gold, SDR etc.). Therefore, the variable is expected to have negative effect if the reserves are used as a measure of remedy or savings and positive if not.

c. Money

The money offer including quasi money. Previous studies have used the measure of money offer by central bank (M2) excluding other means of money. According to the first generation models, the months preceding the crisis should be characterized by highly expansionary monetary policy (positive effect). However the effect can be negative if the bank policy aims to preserve the money supply level and continuously finances the foreign exchange demand^{vi}. Also the use of broad money (M4+ quasi money) is broader than M2 used in the past empirical framework.

d. Domestic Inflation

The change of CPI over the last month of Iceland. It is a proxy of macroeconomic mismanagement that is having an adverse effect on a country's economy. It is related positively with the occurrence of a crisis and the money supply.

e. Lending Rate

Official annual lending rate given by the national bank of the country. Interest rates can play a crucial role if there is a collapse in the confidence in the macroeconomic policy stance. In the case of an expansionary monetary policy for example, a collapse of the confidence of forward looking participants in the foreign exchange market pressures monetary authorities to steeply increase interest rates and devalue the official rate. Therefore, the variable is expected to have positive effect.

3.2 Variables Related To the External Sector

f. Balance of Payments

The balance of payments expressed in USD. The conventional view is that this variable is expected to have negative effect if there is deficit cause of the capital flight it will extend. However, the theoretical discussion regarding the effect of current account deficit on the occurrence of currency crises is not so clear. According to Edwards (2001, p.37)^{vii} deficits "may matter". Sasin (2001)^{viii} provided an overview of the empirical studies which have tried to provide links between current account deficits and currency crises.

g. Gold Price

The price of fine troy ounce in London exchange market in USD. The variable has to do with the significance that gold has on global market. Even after the gold standard there are central banks keeping gold reserves which can be sold in the international markets for foreign exchange (usually USD). The "safe port" of gold seems to be very attractive as remedy in crisis periods when the gold price usually rallies. Thus, the gold price has an effect on currency crises and it is connected to the money reserves. The effect depends on central bank policy. If the bank tends to keep gold reserves the effect is positive, if not it is negative.

3.3 Variables Related To Contagion

h. Crisis Elsewhere

It is a categorical binary variable which denotes the presence of a crisis in other country (1) or not (0). The so called crisis elsewhere or, in chaos theory, "butterfly effect", has a significant role in an external currency crisis development. If a country has economic relations with a country hit by an incident it is possible to be infected. The main reasons have to do with the economic contagion between the two countries but also with the speculators' behavior. If a major trading partner of a regional economy collapses then the other partners will collapse with a time lag of one or two months. In the ruble crisis of 1998 the ruble collapse was followed by a delayed collapse in other countries of the former Soviet Union. When a speculator decides to attack he will hit multiple markets in the same region on the same time as it happened in the Asian crisis of 1997. Though we expect positive effect.

3.4 Institutional Variables

i. Economic Freedom

The Heritage index of economic freedom is a total score consisting of indicators on trade, fiscal burden, government intervention, monetary policy, foreign investment, banking, wages and prices, property rights, regulation and informal market. It is provided annually by the Heritage Foundation and it represents the progress that countries might have achieved regarding the implementation of structural reforms. Market and institutional reforms (e.g. the establishment of a sound financial and banking system, the well-functioning of fiscal institutions etc.) offer great assistance to the countries in their effort to prevent a crisis. The effect of this variable is expected to be negative.

Based on Esquivel and Larrin (1998)^{ix}, we try to combine variables which represent the main predictions of both the first, and the third generation models. Variables 1-5 are closely associated with first-generation models. Variable 10 is closer to the second generation models. Variables 6 to 9 are associated with the third generation models^x. The empirical literature

provides little guidance as regards a generally accepted definition of “currency crisis”. The majority of the studies refer to devaluation as large, unique and infrequent or a set of small and repeated incidents. Others use the weighted average of monthly depreciation compared to depreciation of the previous year^{xi}. Liargovas and Dapontas (2008)^{xii} define as a “currency crash” the nominal depreciation of the monthly average exchange rate of national currency against USD of at least 10%, no matter if this comes as result of a speculative attack or not^{xiii}. Pressure indexes concluding official rate, interest rates and reserves are also used^{xiv}. Others use the official rate as a measure. If the official rate raises then the country has to buy the national currency using international reserves in order to keep exchange rate in the band and vice versa on an official rate decline the country has to sell national currency in order to keep the nominal rate in band. But, for the case of Hungary, the official rate can't be a good measure on crisis. I assume that the exchange rate market is efficient, and then any difference between the spot rate and the forward rate of the previous month (Forward spread, $F_t = S_t - f_{t-1}$) can change only through unexpected risk premium and fundamentals changes, and the 9 explanatory variables in order to explain the Forward spread.

For the purposes of the analysis I use the statistic package STATA™ to run our tests and regressions. I have done bivariate correlation test and heteroskedasticity test on the sample and there were not statistical important correlations among the variables or homoscedasticity. Thus I used FGLS panel data heteroskedastic and uncorrelated data. The results on 5% significance are shown on the following table:

Table 1: empirical analysis results.

Variable	Coefficient
Effective Rate	-0.104 (0.009)
Foreign exchange reserves	-0.001 (0.001)
Money supply	0.021 (0.002)
Price level	0.097 (0.122)
Lending rate	0.008 (0.024)
Balance of payments	-0.001 (0.001)
Gold Price	-0.006 (0.007)
Crisis elsewhere	1.25 (0.15)
Economic freedom	-0.548 (0.452)
R ²	0.230 (4.017)

The results show that balance of payments and contagion crisis are statistically significant against the forward spread. The balance of payments importance shows that the capital flight from Iceland was important for the devaluation facing reduction to its external trade balance. The role of balance of payments as an indicator for crises had been reduced the last years because of its unimportance on explaining crises. In the case of Iceland though its role was crucial focusing on the money transfer to the British banks. The other important result

was the crisis elsewhere variable significance. Many analysts under no hesitation connected the global credit crunch with the Icelandic crisis. In fact the investors become risk averters after the US real estate market collapse abandoning high risk markets such as Iceland and Eastern European economies where a major capital flight transferred their funds to “safer ports”, such as gold and derivatives markets which rallied during 2009. The data results show the importance of the crisis contagion effect and we can conclude that the structure of the Icelandic economy and its fundamentals were weak and the collapse was just a matter of time. The American crisis speeded up this process and made banking sector vulnerable to international perils.

The expected result though, is the Lending rate and Price level are significant and with the expected sign. The positive lending rate difference official rate relationship has to do with the risk that the country had and its' unsuccessful efforts to raise interest rates in order to keep Krona rate to its level. The rising national to international interest spread is a leading indicator for currency crises. Also, the CPI spread is important and positive. In empirical studies majority the price level raise is a positive sign of turbulence.

This opinion is strengthened by the Economic freedom rate is important and negative. As happened in many eastern European countries the level of economic freedom was relatively low and the structure and the legal framework of the Icelandic economy was really underdeveloped compared to the other Nordic economies. The weak banking sector had to be bailed out by an equally government which didn't manage to make the reforms for a growing economy, the banks used to be greedy and their trust lowered by their creative accounting and skimming which reveal was the motive of the collapse. Labor market structure was also inconvenient and the temporary unemployment decline turned back for the countries' economy.

The money supply increase was important and it had positive effect. The devaluation^{xv} and the price level raise expectations effect, was stronger than the interest rates raise one. The market participants reacted to overvalued currency and its proposed money supply raise. The Euro zone faced also a per capita money supply rise but in a smaller rate than Icelandic central bank did in order to keep the rate low.

The Icelandic crisis can be explained with these important variables. First of all the economic freedom has played important role in the creation of crisis. The Icelandic economy was really a closed one avoiding the introduction of economic reforms based on its past and developing and encouraging specific industries, such as fishery and tourism, and putting barriers on the capital flight from its residents. Also the central bank tried to attract additional foreign funds from the EU with its decision to raise the interest rates to unexpected high levels, in order to avoid possible sharp devaluation and

to reduce inflation. The bank kept interest rates high till the end. Finally, the country was characterized by high inflation which begun in 2006, because of the loose financial policy due to forthcoming elections (2007). Inflation was really the main cause as it raised foreign debt and the high volatility of the Icelandic Krona had always. Iceland had as a major target inflation reduction, but without success, leaving the country exposed to the high interest rates imposed.

4. CONCLUSIONS AND FURTHER RESEARCH

The purpose of this paper was to explain the recent currency crisis in Iceland and draw some lessons for the Greek or Irish economy. Surprisingly, the American credit crunch did not seem to be connected with the currency crisis in Iceland directly. The crisis was due to the expansionary monetary policy of the country expressed with high inflation and high interest rates. The central bank did not really modify its monetary policy during the crisis, but it tried with acquisitions to fund the collapsing commercial banks. The non-implementation of structural reforms was an additional factor contributing to the currency crisis occurrence. What lessons can be drawn for the European economies? First monetary policy is drawn from the European Central Bank, not from national authorities and can characterize as relatively tight. So there is no danger from this front. Things are not the same as regards structural reform. Countries that lag behind in the implementation of structural reforms related to the labor market, the goods market, the knowledge economy, the state as well as the pension and insurance systems (e.g. Greece) will face greater risks compared to other European countries Iceland already has done the first steps for a path leading to European union and EMS participation and economic remedy. In a further research someone can test if this crisis was forecast able and how and make compare studies with similar characteristics countries from the region or globally focusing on the fact that they didn't share Iceland's fate and why.

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