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## MONETARY TURBULENCE AND THE ICELANDIC ECONOMY

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One of my favorite sentences of the last five years—that is, the one that I have re-written most often—is that “The last thirty five years has been the most tumultuous in monetary history.” “The Age of Turbulence” is the title of Chairman Greenspan’s memoir. His book is a marvelous read for policy wonks—but there is relatively little discussion of the sources of turbulence.

The financial turbulence centers on three sets of events, including several waves of financial crisis; the credit crunch now underway in the United States and Britain and Iceland and Ireland is one of these waves. Countrywide Financial the largest US mortgage lender was on its way to insolvency in August 2007 before being rescued by the Bank of America. Northern Rock the largest British mortgage lender would have closed if credits had not been available from the Bank of England; Northern Rock has been nationalized. Both Countrywide and Northern Rock experienced runs in the commercial paper market. Bear Stearns, the fourth largest US investment bank, failed because the counterparties in the wholesale financial markets would no longer accept its commitments. UBS, the large Swiss investment bank, has reported losses totaling \$36 billion. AIG, the largest US insurance firm, has reported losses of \$12 billion and is seeking to raise \$20 billion of new capital. Several German banks have collapsed because of losses on their holdings of mortgage-backed securities. The accumulated losses of the commercial banks and the investment banks and insurance companies are now estimated to at nearly \$400 billion.

The second set of turbulent events centers on several credit bubbles, which usually have involved four or five or more countries in a wave. The most recent wave involved increases in real estate prices in the Anglo-Saxon countries (except Canada) as well as in Ireland and in Spain; the surge in real estate prices and stock prices in Iceland between 2002 and 2006 is part of this wave. The first wave of these credit bubbles involved the rapid increase in loans from the major international banks headquartered in New York, London, Toronto, and Tokyo to Governments and government-owned firms in Mexico and other developing countries in the 1970s. The surge in real estate prices and stock prices in Japan and in three of the Nordic countries—Finland, Norway, and Sweden—in the second half of the 1980s comprised

the second wave. Mexico, Thailand, South Korea, Brazil, and Russia were among the countries in the third wave in the mid-1990s. (A brief note on terminology--a bubble is a non-sustainable pattern of financial flows; when the flow of new money stops, a crisis follows because the borrowers prove unwilling or unable to repay. A credit bubble involves a rapid increase in bank loans to a specific group of borrowers; an asset bubble involves a rapid increase in the price of stocks or of real estate. Most asset bubbles follow from a rapid increase in bank loans, however the US stock price bubble in the late 1990s was not based on rapid increase in credit.)

The third feature of turbulence has been the wide swings in the values of national currencies relative to those projected from national differences in inflation rates. The US dollar price of the Euro has increased by nearly seventy five percent between 2001 and 2008, even though the differences between the inflation rates in the United States and Europe generally averaged less than two percent a year. An increase in the flow of money to a country usually led to an increase in the value of its currency; the country's imports increase significantly relative to its exports. Once the inflow of money slowed, the value of the currency declined, in some cases rapidly. The depreciation of the Mexican peso at the end of 1994 and of the Thai baht and the South Korean won in the second half of 1997 resulted in massive revaluation losses and led to the bankruptcy of many firms and most banks in these countries.

The swings in the values in national currencies, the bubbles in real estate prices and stock prices, and the subsequent financial crises are systematically related. Thus an increase in the flow of money to a country leads to an appreciation of its currency and induces increases in the prices of stocks and real estate in that country. The economy booms as investment spending and especially household consumption spending surge. Because the inflow almost always is at a rate that is too rapid to be sustained for more than three or four years, the inevitable decline in the inflow leads to a depreciation of the country's currency.

Despite the monetary turbulence since the early 1970s, the period has been one of remarkable economic prosperity, and in a wide range of countries—the United States, South Korea, Brazil, Israel, China, Thailand, Britain—and Iceland.

Iceland experienced a rapid increase in the foreign demand for krona securities and extremely rapid increase in stock prices between the end of 2002 and the end of 2006. The motivation for this paper was that the impacts of an autonomous increase in the foreign demand for securities denominated in the Icelandic krona on asset prices would be directly evident in a small open economy. The next section of this essay summarizes a model that relates the increases in the prices of securities in a country to an autonomous increase in the foreign demand for these securities. This model is derived from Keynes' view of the transfer problem at the end of the First World War; he concluded that the reparations that the French wanted to impose on the Germans were too large relative to the ability of the Germans to depress domestic consumption relative to production. and the ability of the French to increase consumption relative to production. Then the increases in prices of stocks and of real

estate in Iceland that began about 2002 are reviewed in terms of this model; the surge in money inflows to Iceland at that time triggered a rapid increase in real estate prices, and an extremely rapid increase in stock prices and bank capital.

Subsequently three financial anomalies or imbalances in Iceland are identified--the first is the ratio of the Iceland's current account deficit to its GDP, and the second is the ratio of asset prices in Iceland to its GDP. The third is the ratio of the assets of the Icelandic banks to the country's GDP; several of the statements like "Iceland is an international financial center" are evaluated. The sixth and concluding section deals with the two policy issues; one involves the structure of the banking system and the range of activities of the deposit money banks and the other involves the foreign exchange value of the Icelandic krona.

## 1. THE TRANSFER PROBLEM PROCESS WHEN CURRENCIES ARE FLOATING

France imposed large reparations payments on Germany at the end of the First World War; the Germans agreed to pay the French the equivalent of 30 billion gold francs over 30 years. Keynes' classic analysis of the transfer problem highlighted the distinction between the production of goods and services in a country and the absorption of resources within each country. The counterpart of the flow of money from Germany to France would have been the flow of real resources of comparable value. If real resources were to flow from Germany to France, then consumption or absorption in Germany would have to decline relative to production by an amount that corresponded to the annual reparations payment. If France were to absorb the real resources from Germany, then consumption or absorption in France would have to increase and exceed French production by the amount of the intended payment. The Germans would have to increase taxes sharply to increase the wedge between production and consumption, while the French would have to reduce taxes to encourage the demand for the resources that would be made available by the Germans.

The transfer problem model can be used to analyze the adjustments within a country to a shock in the form of an autonomous increase in the foreign demand for assets within the economy. These adjustments are necessary so the country absorbs the real resources—the goods and services-- that are the counterpart of the inflow of money, in terms of the balance-of-payments accounting framework, the country must develop a larger current account deficit that is the counterpart of the increase in its capital account surplus. Absorption must increase relative to production within the country that experiences the inflow of money from abroad.

Two complementary adjustments facilitate absorption. One is that as the country's currency appreciates, its imports increase relative to its exports due to the change in relative prices; by itself this adjustment would lead to decline in the country's GDP because of the increase in the demand for imports relative to the demand for domestic goods. The second adjustment is that the prices of assets and of securities available within the country increase and the resulting growth in household wealth leads to an increase in spending on both domestic goods and on imports.

The increase in the prices of assets and of securities reflects that those who sell their assets to the foreigners use most of their receipts to buy other assets from other domestic residents, and at ever-higher prices. The foreign money becomes like the proverbial hot potato, and asset prices continue to increase until the decline in the country's savings more or less corresponds to the increase in the inflow of money from abroad. The combination of the decline in the price of imports and the increase in GDP leads to the increase in absorption. .

The increase in absorption could involve some combination of an increase in the government's fiscal deficit, an increase in business investment, and an increase in household consumption (its dual is a reduction in household saving). The stylized fact is that the only time that the inflow of money has been associated with an increase in the fiscal deficit has been when the inflow is a response to an autonomous increase government borrowing, as in Mexico and other developing countries in the 1970s. In all of the other cases, the fiscal deficit declines because the boom that follows from the increase in the inflow of foreign money leads to a surge in government revenues. Much of the counterpart to the inflow of money from abroad is that household consumption increases in to the increase in household wealth. Indeed, asset prices increase until the decline in the household saving rate corresponds with the increase in the inflow of money.

The transfer problem also is relevant when the asset bubble in a country implodes; the country's currency depreciates in response to a decline in the inflow of funds. The observed decline in the value of the Mexican peso in 1994 resulted from the decline in the foreign demand for Mexican securities, which was inevitable and hence predictable since Mexico's external indebtedness was increasing three or four times as rapidly as its GDP. The sudden depreciation of the peso had both inflationary and deflationary impacts in Mexico, the prices of imports and exports increased as the peso depreciated, and interest rates on peso securities surged in response to the decline in the foreign demand for peso securities.

## 2. THE TRANSFER PROBLEM AND ASSET PRICES IN ICELAND

. The increase in the foreign demand for Icelandic securities that began in 2001 induced an appreciation of the Icelandic krona and contributed to dramatic increases in the price of residential real estate and in the price of Icelandic stocks. While most

of the time series summarized in this paper begin in 2000 and conclude in 2007, the discussion is centered on the changes in values during the four years from the end of 2002 to the end of 2006 when the increase in asset prices was rapid.

(Correspondingly, the changes in flow variables like GDP and the current balance are from the 2002 values to the 2006 values.) The effective foreign exchange value of the Icelandic krona increased by nearly thirty percent from the end of 2002 to the end of 2006; Iceland's current account deficit increased from four percent of its GDP in 2003 to twenty six percent in 2006. The capital of the three Icelandic deposit money banks at the end of 2006 was eight times larger than at the end of 2002. The assets of these banks at the end of 2006 were more than four times larger than at the end of 2002.

Two problems are encountered when using the data on the changes in the ratio of Iceland's current account deficit to its GDP to measure the impact of money inflows on the value of the krona. The first involves the lack of dimensional equivalency because Iceland's trade balance is measured in the US dollar and its GDP is measured in krona. The krona GDP is converted to a US dollar GDP at the prevailing value for krona in the currency market, usually the average value for the year. Iceland's GDP in US dollar terms increased relative to its GDP in krona in response to the appreciation of the krona. The larger the real appreciation of the krona induced by the money inflows, the larger the increase in the US dollar equivalent of Iceland's GDP, and the lower the ratio of Iceland's current account balance to its GDP—as measured in the US dollar or the Euro. (If the ratio of Iceland's current account deficit to its GDP had not increased, then the US dollar value of Iceland's GDP would have increased at the same rate as the krona value of its GDP, and the ratio of Iceland's current account deficit to its krona GDP would have been thirty to forty percent larger.)

The scope of the distortion about the ratio of Iceland's current account balance to its GDP depends on the sensitivity or elasticity of the krona to changes in the inflow of foreign money. The lower the elasticity, the larger the increase in the value of the krona for a given increase in the inflow of foreign money. Because of the skewed nature of Iceland's exports of goods and services—fifty percent are fish-related—and the small size of the domestic manufacturing sector, the (conservative) assumption is that each increase of money inflows of one percent of Iceland's exports has led to an increase in the value of the krona of 1.2 percent.

The second measurement problem has resulted from the impacts of the investment in the extremely capital intensive hydro-power smelter project on the value of the krona. The financial cost is estimated at \$2.5 billion, fifteen percent of Iceland's GDP in 2006. Most of the resources or "machine tools" used in construction—the turbines and the pots and the arcing equipment as well as the labor necessary to build the dams, install the generators, construct the electrical transmission lines from the power plants to the smelters, and build the smelters and the ports—and much of the labor were imported. To the extent that the machine tools and the labor were imported, the flow of foreign money to Iceland summarized in the

country's balance of payments accounts is imputed and did not affect the market value of the krona. In contrast to the extent the foreign money was paid to Icelandic firms and individuals, the krona appreciated. The first assumption is that one-third of the capital costs of \$2.5 billion led to payments to firms and individuals in Iceland and the second is that these payments were similar in 2005, 2006, and 2007.

This first measurement problem leads to an understatement about the scope of the impact of the increase in Iceland's current account deficit on the domestic economy. In contrast the second problem leads to an overstatement the impact of the current account deficit on the value of the kronor.

Several different measures of Iceland's GDP and several values for its international accounts are shown in Figure 1. The increase in the value of the krona and the increased in Iceland's current account deficit were especially rapid from 2003 to 2005. The money flows associated with the aluminum smelting complex increased the current account deficit as reported in the balance of payments accounts by four to five percent of Iceland's GDP in each of three years 2005, 2006, and 2007, but the flows that led to a direct impact on the value of the krona were less than two percent of GDP.

Figure 1

	2000	2001	2002	2003	2004	2005	2006	2007
<b>ICELANDIC MACRO PARAMETERS</b>								
<b>VARIABLES</b>								
GDP, ISKB	682	770	812	840	926	1022	1142	508*
GDP 2000 prices	682	709	708	728	783	839	861	
GDP Growth, %	4.5	3.9	0.2	2.5	7.6	7.4	4.2	3.1
GDP,US\$B	8.7	7.9	8.9	10.9	13.2	16.2	16.3	15.9**
ISK/USD	78.6	97.4	91.7	76.7	70.2	62.9	70.2	64.1
ISK/EUR	72.6	87.4	86.2	86.7	87.1	78.2	87.9	87.7
Exchange rate index	100	87.5	93.0	98.9	101.6	114.6	106.7	112.8
InvestmentinConst (%GDP)	14.3	13.0	12.6	14.2	17.0	17.4	21.2	
InvestmentinDwellings (%GDP)	10.4	8.7	8.8	8.8	11.0	12.9	11.6	
CurrentAcctBal,US\$M	-847	-336	145	-534	-631	-2632	-4457	-3190
CurrentAcctBal/GDP	-10	-4	2	-5	-5	-16	-27	-20
CurrentAcctBal, ISKB	-68	-31	16	-42	-46	-164	-308	

\*GDP for the first two quarters of 2007

\*\*GDP for the first two quarters projected at an annual level

Sources—Statistics Iceland, Bank for International Settlements, International Monetary Fund, Landsbanki, Daniel Gros, “Iceland on the Brink?” CEPS Policy Brief no. 157

Between 2002 and 2006 Iceland’s GDP increased by 329 ISKB (from 812 ISKB in 2002 to 1,141 ISKB in 2006) and its current account deficit increased by 217 ISKB (from a surplus of 13 ISKB in 2002 to a deficit of 204 ISKB in 2006.) The values in Figure 2 are taken directly from International Financial Statistics. The total of goods and services increased by 546 ISKB. Iceland had a small fiscal deficit in 2002 and a large fiscal surplus in 2006; this changes of 73 ISKB meant that the supply of goods available for private investment and household consumption increased by 619 ISKB. Private investment increased by 76 ISKB; hence household consumption spending increased by 548 ISKB.

The ratio of household consumption spending to GDP was 74 percent in 2002 and 87 percent in 2006. Household saving declined significantly as a share of GDP. The inflow of foreign money had a significant displacement impact on domestic saving.

Figure 2

SECTORAL ABSORPTION PARAMETERS

	2000	2001	2002	2003	2004	2005	2006	2007
	ISK, Billions							
GDP	682	769	812	840	926	1022	1141	1214
Private Investment	159	180	205	217	231	251	281	
Fiscal Balance	-9	26	-4	-13	-9	-52	69	
CurrentAccountBalance	-50	-8	13	-26	-52	-127	-204	
Household Consumption	582	571	598	584	746	950	995	

Source: International Financial Statistics

The implication of the model is that the dramatic increase in household consumption spending both absolutely and as a share of GDP resulted from the increase in household wealth. Stock prices and real estate prices are shown in Figure 3. The surge in these prices began in 2003. .

(There appears to be no time series for the market value of residential real estate in Iceland. Icelanders spend a much higher proportion of their incomes on housing than Americans, in part because construction costs are higher and because of the long winters. The market value of US residential real estate was 110 percent of US GDP in 2000; the assumption in line xxx is that Icelanders spend one-third more of their income on housing than Americans.) The increase in the market value of real estate for subsequent years is the product of this assumption for the base year and the index for the changes in the price of real estate.

Two time series are available for stock prices, one is from International Financial Statistics and the other is from Icelandic Stock Exchange. The increases in stock prices in both series are similar. The data from the stock exchange indicate that stock prices in Iceland at the end of 2006 were more than eight times higher than at the end of 2002; the IFS data indicates that stock prices at the end of 2006 were almost five times higher.

Figure 3

## REAL ESTATE PRICES, STOCK PRICES, AND HOUSEHOLD WEALTH

	2000	2001	2002	2003	2004	2005	2006	2007
GDP, ISKB	682	770	812	840	926	1022	1142	1250*
ASSET PRICES								
Real estate prices	100	111	116	129	143	184	215	235
Real estate values	998	1108	1158	1287	1427	1836	2146	2345
OMX ICE equities ISK Bs	369	362	317	589	1,019	1,815	2,596	2,543
“ “ 100=2000	100	98	86	159	276	492	704	689
MktValStocks/GDP	54	47	39	70	110	178	227	212*
GDP	100	113	119	122	135	149		
RealEstatePrices/GDP	100	98	97	106	104	124		
StockPrices/GDP	100	87	72	139	204	330		
Household Wealth	2049	2240	2287	2716	3372	4673	5884	6138
HouseholdWealth/GDP	300	291	282	323	364	457	515	491

Sources: Statistics Iceland, Iceland Stock Exchange, International Financial Statistics

The estimates of household wealth shown in Figure 3 are based on the assumption that households own “three assets”—fixed price assets like demand deposits and savings deposits and bonds whose market value is equal to GDP, and variable price assets including real estate and stocks. Because of the increase in prices of stocks and of real estate, the absolute value of household wealth at the end of 2006 was nearly three times the absolute value at the end of 2001, and the ratio of household wealth to GDP at the end of 2006 was one hundred eighty percent of the value of the same ratio at the end of 2002.

Rapid increases in real estate prices almost always result from a rapid increase in bank credit, since a significant part of most purchases are financed with borrowed money. Nearly every country that has experienced a significant increase in real estate prices has had a comparable percentage increase in bank credit.

The values of major assets and liabilities and capital for the deposit money banks summarized in Figure 4 are reproduced from International Financial Statistics. Some line entries with low values in the IFS presentation are not reproduced in Figure 4, and the totals for assets and liabilities shown in Figure 4 are not shown in IFS. The capital account entry in Figure 4 is identical with line 27A in IFS.

The assets of the Icelandic banks at the end of 2006 were six times larger than at the end 2002. At the end of 2002 the assets of the banks were slightly more than twice as large as the sum of their demand and savings deposits, at the end of 2006, the assets of the banks were five times larger than the sum of their demand and savings deposits.

Figure 4

#### FINANCIAL PARAMETERS FOR ICELANDIC BANKS

Billions of Krona, End of Period

2000	2001	2002	2003	2004	2005	2006	2007
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<b>ASSETS</b>							
Reserves	26	21	26	13	29	37	47
Foreign Assets	21	29	46	113	174	538	1332
Claims on Private Sector	664	773	859	1097	1531	2543	3733
Shares							
Assets—total	717	838	939	1240	1740	3126	5121
<b>LIABILITIES</b>							
Demand Deposits	65	63	80	106	133	164	191
Savings Deposits	226	272	306	367	406	534	931
Bonds	169	196	274	564	999	1992	3075
Foreign Liabilities	224	258	226	216	223	337	681
Due Monetary Auth	39	54	69	24	33	79	120
Liabilities—total	685	790	887	1254	1761	3527	4878
Capital Accounts	66	96	117	157	336	587	967
Other	-73	-101	-134	-194	-391	-566	-849

Source: International Monetary Fund

Because banks are subject to capital-asset regulatory ratios, in the long run bank assets cannot increase significantly more rapidly than bank capital. In most countries bank capital is in the range of ten to twelve percent of bank assets. A cliché is that banks earn one percent on their assets and ten percent on their capital. The capital of the Icelandic banks at the end of 2006 was nearly eight times larger than at the end of 2002.

Banks can increase their capital from external sources by selling common stock and preferred stock; banks also can increase their capital from internal sources-- from income on interest rate spreads, fees, and profits from owning and trading securities. The more rapid the increase in bank capital, the greater the likelihood that the increase in bank capital resulted from the increase in the prices of variable assets owned by the banks. The last row in Figure 5 shows the annual rate of increase in bank capital as a ratio of bank capital at the end of the previous year.

Figure 5

	2000	2001	2002	2003	2004	2005	2006	2007
<b>ASSETS</b>								
Assets—total	717	838	939	1240	1740	3126	5121	
Capital Accounts	66	96	117	157	336	587	967	
Increase		30	21	40	179	251	360	
Return on Capital%			46	22	34	118	75	61
Capital/Total Assets		9.2	11.7	12.4	12.7	19.4	18.8	18.9
Equities	26	36	29	89	165	396	422	545
EQ/Assets	3.6	4.3	3.1	7.2	9.5	12.7	8.2	
<b>TRGAINS</b>								
	-5%	-9%	5%	23%	24%	30%	26%	8%

Source; International Financial Statistics,

Figure 6

	2000	2001	2002	2003	2004	2005	2006	2007
<b>INCREASES IN STOCK PRICES AND BANK CAPITAL</b>								
Stock price index	100	98	86	159	276	492	704	689
%Change		-2	-12	85	74	78	43	-2
Capital Accounts	66	96	117	157	336	587	967	
	100	145	177	238	509	889	1465	
%Change		45	22	35	113	75	65	

The entry for the stock price index in Figure 3 and the entry for the capital accounts of the deposit banks in Figure 4 are grouped in Figure 5. The third row sets the value for the capital

The entry for the stock price index in Figure 3 and the entry for the capital accounts of the deposit banks in Figure 4 are grouped in Figure 6. The third row sets the value for the capital at 100 in the year 2000 to facilitate the comparison between the increase in stock prices and the increase in bank capital; the capital of the banks increased twice as rapidly as stock prices. The annual percentage changes in stock prices and in the capital accounts of the banks are shown; the years when bank capital increased most rapidly are the years when stock prices increased rapidly.

The sixth row shows that the ratio of the capital of the banks to their total assets has more than doubled and is significantly higher than the regulatory minimum. In 2004 and 2006, the percentage increase in the capital of the banks was significantly larger than the percentage increase in stock prices, in 2003 the percentage increase in stock prices was significantly larger, and in 2005 the percentage increases in the two series were in the same ballpark. The large amount of capital in excess of the regulatory minimum is consistent with the rapid increase in capital occurred as a result of a “passive activity” on the part of the banks. .

The tentative conclusion is that the rapid increase in the capital of the banks that began in 2003 resulted primarily from their gains on their holdings of stocks.

At the end of 2006, the market value of the shares in the index was eight times higher than the market value at the end of 2002. (; the increase in the indewould have been significantly more rapid if Actavas had not been dropped from the index when the firm was became private.) At the end of 2006, the market value of the shares of the three large banks was 48 percent of the market value of the shares all of the firms in the index; at the end of 2002, this ratio had been 32 percent.

Figure 7

## STOCK MARKET VALUATIONS

	2000	2001	2002	2003	2004	2005	2006	2007
Three banks	80	82	100	210	515	1001	1247	1376
Market	370	362	317	590	1019	1815	2595	2543
ThreeBanks/ Market	22	23	32	36	51	55	48	54

Source:

The increase in the share of the market value of the three banks might have resulted from one of several different factors. The price-earnings ratio for the banks may have increased relative to the same ratio for the non-bank firms whose stocks are included in the index. The

earnings of the banks may have increased more rapidly than the earnings of the non-banks. The banks may have purchased shares of non- bank firms.

Figure 8

## BANK FINANCIAL PARAMETERS

		Billions of Krona, End of Period							
		2000	2001	2002	2003	2004	2005	2006	2007
Kaupthing									
	Assets					1554	2541		
	Liabilities					1396	2338		
	Capital					159	203		
Landisbanki									
	Assets			278	448	737	1406	2173	3058
	Liabilities					698	1292	2023	2874
	Capital total equity					39	114	149	184
Glitnir									
	Assets				444	675		2246	2949
	Liabilities				415	625		2100	2779
	Capital				29	50		146	170

The rapid increase in stock prices led to sharp increases in the net worth of every investor and institution that owned stock. As prices increased, one group increased its holdings of stocks this group was willing to pay the price necessary to bid the shares away from other investors.

An individual investor can buy the shares of the non-bank Icelandic firms directly, or this investor can buy these shares indirectly by purchasing the shares in one or several of the Icelandic banks; in the second case the investor is buying shares in a financial intermediary that resembles a closed end mutual fund that owns a diversified portfolio of variable price assets and fixed price assets. This financial intermediary has a window that sells demand deposits and other fixed price liabilities and that manages the payments system with the other two similar firms. The Icelandic banks differ sharply from those in most other countries, in that the variable price assets in their portfolios are more than forty percent of their total assets.

Consider two competing explanations for the increase in stock prices. One story is that someone—perhaps Eric the Red —paid a higher price for stocks and so he was willing to pay the price necessary to induce others to sell the stocks. . If Eric had been the buyer, stock prices would have increased, and the three banks in effect would have sold some of their stocks to Eric. The ratio of the market value of the shares of the three banks to the market value of all firms would have declined. The competing story is that the banks were on the margin, the winning bidders, and they bought shares from the other market participants.

The price earnings ratio of the banks did not increase relative to the same ratio for the other firms in the index.. The rapid increase in the capital of the banks suggests that their “earnings” were increasing at a rapid rate. MORE HERE

These same statements can be made about an individual investor, say Eric the Red. If Eric buys more shares, the prices of shares increase, and Eric’s net worth increases. The major difference between the purchases of shares by any of the three banks and by Eric the Red is that the increase in the capital of the banks that follows from the increases in the price of shares enable them to increase their lending—and they benefit from ten to one or eight to one leverage—which is much greater than the leverage available to Eric the Red.

By deduction the increase in the market value of the shares of the three banks relative to the non-banks reflected that the banks were buying shares. Their purchases induced increases in the prices of shares of these firms. The market value of the shares of the three banks increased because the banks increasingly were becoming more like mutual funds, and hence the value of the shares of the banks reflected some combination the earnings from their banking activities and their mutual funds.

The data confirm that the increase in the flow of foreign money to Iceland was associated with a consumption boom that followed from a surge in household wealth. The increase in the flow of foreign money was associated with a rapid increase in stock prices, which contributed to a surge in the capital of the three banks, and in the rapid increase in bank credit.

The increase in stock prices in Iceland in the last few years seems similar to the six-fold increase in stock prices in Japan from the end of the 1970s to the end of the 1980s. The Japanese banks owned large amounts of stock and of real estate. (One difference is that real estate prices in Japan increased at about the same pace as stock prices.) As stock prices and real estate prices increased, the value of the shares and real estate owned by the banks increased. Because the share of these variable-price assets in the total bank assets was larger than the regulatory capital as a share of bank assets, the increase in real estate and stock prices led to an increase in the excess capital of the banks—the amount of capital over and above the regulatory minimums. The Japanese banks then were in a position to grow their loans which led to further

increases in the prices of stocks and real estate. The Japanese appeared to have the financial equivalent of a perpetual motion machine.

### 3. THE RATIO OF THE CURRENT ACCOUNT DEFICIT TO GDP—THE FIRST ICELANDIC ANOMALY

A key question for a small open economy like Iceland is the appropriate size of its current account balance relative to its GDP.

One projection is that Iceland's current account deficit will be about ten percent of its GDP until 2012. Since the rate of GDP growth will be low, Iceland's net international indebtedness will increase relative to its GDP.

The "facts" about the size of Iceland's current account deficit are ambiguous, in part the reported current account balance does not include two "receipts" of "investment income" that Icelandic individuals earn on their foreign assets—one is the increase in the wealth of Icelandic individuals when prices of the foreign shares that they own increases, and the second is the increase in the value of their shares in foreign holding companies. If the reported current account balance were adjusted to include these two "receipts", then Iceland would have a current account surplus. .

A country with a current account deficit is subject to the same limit theorem that affects every economic unit; in the very long run, the country's net external indebtedness cannot increase more rapidly than its GDP. Since the ratio of Iceland's current account deficit to its GDP has been higher than the rate of growth of its GDP since 2003, Iceland has been violating the limit theorem. A country can violate the limit theorem in the short run and in the intermediate run, as Iceland has since 2003; Moreover a country can violate this theorem for decades as long as the ratio of its net international indebtedness to its GDP is twenty or thirty or forty percent—but the country cannot violate this theorem in the long run if the ration of its net international indebtedness to its GDP is high because of the problem of financing the current account deficit.

The irony is that Iceland's current account deficit has increased because of foreign purchases of securities denominated in the krona are significantly larger than they were four and five years ago; as these purchases decline, the krona will depreciate. These foreign buyers might reduce their annual purchases because they have concluded that the share of krona-denominated securities in their portfolios has attained the appropriate size or that the krona might depreciate—which then would become a self-fulfilling projection.

Iceland now is a “young debtor” country; all of the money to pay the interest on its net international indebtedness is obtained from new foreign loans. That situation is explosive and not sustainable; at some stage Iceland will need a modest trade surplus so that the money from the excess of its export earnings over its import payments can be used to pay some of the interest to its foreign creditors.

The likelihood is low that Iceland will be able to finance a current account deficit that is two to three times as large as the projected rate of growth of its GDP given the high ratio of its net international indebtedness to its GDP because the foreign investors would become increasingly reluctant to add to their holdings of krona securities. At some stage Iceland must develop a trade surplus—more precisely a current account surplus exclusive of net investment income payments abroad—to obtain some of the dollars and the Euros that can be used to pay part of the interest to the foreign creditors.

The adjustment to a sustainable value for the current account balance might occur at the current value for the krona in the foreign exchange market; perhaps if there were a surge in the export earnings from the current and planned aluminum smelters. Otherwise the move to a sustainable value for Iceland’s current account balance will involve a depreciation of the krona.

The adjustment to a sustainable external financial position for Iceland might occur smoothly, which would involve a decline in the ratio of the current account deficit to Iceland’s GDP by one to two percentage points a year perhaps for six or eight years until the ratio reaches a sustainable value. Alternatively the adjustment to a sustainable value might involve a sudden sharp depreciation because foreigners would become sellers rather than buyers of krona securities; interest rates on krona securities would surge because of the sharp reduction in the credit supply.

The experience of most other countries suggests that there must be a significant depreciation of the krona to position Iceland so it can earn some of the foreign currencies necessary for the payment of interest on its net international indebtedness.

A reduction in the ratio of Iceland’s current account deficit to the country’s GDP of five or six percent or more is very large, especially since most of the change would involve a decline in imports. The decline in the foreign exchange value of the krona could be ten or twenty percent—a reversal of the real appreciation of the currency that began in 2002.

## 5. ICELANDIC INCOME AND WEALTH —THE SECOND ANOMALY

Iceland has one of the highest GDP per capita in the world; the 2007<sup>th</sup> edition of the Economist’s “Pocket World in Figures” places Iceland in the number 8 position

with a per capita income of \$41,910. The United States is in the number 9 position with a per capita income of \$39,430.

Icelandic households are “wealthy” compared with those in traditional industrial countries, with a higher ratio of assets to income. Most families own their homes. The country’s pension system is “fully-funded”. There probably is a lot of business proprietorship wealth that is unrecorded—fishing boats, shops, small service establishments.. Moreover Icelanders own significantly more foreign stocks than foreigners own of Icelandic stock.

Figure 9

## PRIVATE SECTOR WEALTH

## ISKB

	2000	2001	2002	2003	2004	2005	2006	2007
Stocks	370	362	317	590	1019	1815	2595	2543
Homes	682	757	949	1084	1324	1881	2455	2853
DemandSavings	291	335	386	474	538	697	1122	900
Sum	1353	1454	1652	2058	2881	4393	6172	6296
GDP	682	770	812	840	926	1022	1142	1214
Ratio	198	189	203	245	311	430	540	519
4Claimsprisector	664	773	859	1097	1531	2543	3733	
/gdp	97	100	106	131	165	249	327	
Stocks/GDP	54	47	39	70	110	178	227	209
ForeignEquites\$	2128	1795	1853	3369	5838	9282	12834	
Inflow\$	15	118	236	293	781	3690	4953	

Convert to iskvalues

SOURCE: International Financial Statistics

One of the stylized facts from financial history is that when there is a sharp increase in the price of stocks or of real estate in a country, household balance sheets

“explode”—the value of the household assets increases very rapidly, both absolutely and relative to household income. Household liabilities also increase, but since these are fixed price liabilities while the most of the assets acquired with the borrowed money were variable price assets, household net worth surges.

At the end of 2002, the value of household wealth shown in Figure 9 was about Two times GDP; at the end of 2006, wealth was nearly five times GDP.

The scheduled interest payments of the households increase at a rate commensurate with the increase in their indebtedness. Some households may have a cash flow problem, in that their scheduled interest payments may have increased more rapidly than their rental income if they have purchased properties and their dividend income if they have purchased stocks. As long as asset prices and their net worth are increasing, these households can borrow to obtain the money for these payments; increasing the amount borrowed should not be a problem.

At some stage it is inevitable that the rate of increase in the prices of stocks and real estate will decline below the interest rate. Household net worth will increase at a less rapid rate or more likely decline. Some households will decide that their most attractive financial option is to shrink their balance sheets; they will sell some of their variable price assets and use the proceeds to reduce the amounts owed lenders.

Inevitably the sale of assets by these households will depress their prices. More households will come to the same conclusion. Their sales of variable price assets will depress their prices further. An increasing number of households will observe that the market value of their variable price assets is less than the amounts borrowed to finance their purchase of these assets.

The value of bank claims on the private sector was in the same ballpark as GDP from 2000 to 2003, and then began to surge at about the same time as stock prices began to increase sharply. The coincidence of the changes in these two time series probably is not an accident; bank loans increased sharply so investors that would use the money to buy stocks

The tentative assumption is that the real rate of return on Icelandic krona bonds is modestly higher than on US dollar bonds. The implication of this assumption is that the price of Icelandic equities should be below the price of US equities. The implication of the assumption that the US corporate sector is more vibrant than the corporate sector in Iceland is that price earnings ratio for Icelandic stocks should be below the comparable ratio for US stocks.

There is then a sharp conflict between the current level of stock prices in Iceland and the level that seems consistent with the interest rates and the rate of growth of profits. Stock prices in Iceland now seem at a disequilibrium level, much like those in the United States in 1999, with the difference that interest rates in Iceland now are more than twice as high as they were in the United States in 1999.

There must be large numbers of investors that purchased Icelandic stocks with borrowed money that now have a “negative carry”—their interest payments are several times or many times larger than their investment income. Some of these investors will become distress sellers of stocks.

The invisible hand will lead to a reduction in the ratio of the market value of household wealth to GDP. The reduction could involve a decline in prices of residential real estate, either rapidly or slowly, and to a more rapid reduction in stock prices.

## 6. BANK ASSETS AND GDP--THE THIRD ANOMALY

The value of the assets of the three Icelandic banks at the end of 2002 was 110 percent of Iceland’s GDP in 2002; the value of their assets at the end of 2006 was 450 percent of the Iceland’s GDP in 2006. The domestic assets of these banks are x times Iceland’s GDP.

That the total assets of the Icelandic banks are so much larger than the country’s GDP has led to several different clichés—one is that “Iceland is an international financial center”, and another that “Iceland is a hedge fund.”

Virtually every international center promises political stability; without the promise of stability, a center will not attract foreign money. Stability is the necessary condition, but not the sufficient condition. .

Financial centers develop because they have a cost advantage or a regulatory advantage relative to the domestic markets of those who demand or buy their services. Usually a financial center attracts investors or business from abroad because it offers an advantage; the firms in the center may have developed cost-savings that enable them to pay higher interest rates than foreign centers. London is an offshore banking center, especially for those who want to buy deposits denominated in the US dollar; the reserve requirements applied to US dollar demand deposits in the United States are not applied to US dollar deposits in London. These reserve requirements are like a tax on deposits; to the extent that the tax can be avoided, the center can pay higher interest rates. Similarly the deposit insurance premium is not applied to US dollar deposits in London. Banks headquartered in many different countries have established branches in London to compete with British banks for deposits denominated in the US dollar and in other foreign currencies.

Some of these centers specialize in providing tax avoidance services, they are low tax jurisdictions for “parking income” that had been earned in high—or at least higher-- tax jurisdictions. Some Swiss cantons sell tax avoidance services, they have

especially low taxes on the income of wealthy non-Swiss. Some centers provide privacy from the tax collectors nearby countries.

Some financial centers provide money laundering services or a place to park money of uncertain or disreputable origins. Chinese money is placed with banks in Singapore. Luxembourg developed as an offshore banking center because it offered tax advantages to Germans.

The “advantages” of Iceland as an international financial center do not adhere to “Icelandic regulatory space”; if they did, one or several foreign banks would have established branches or subsidiaries in Reykjavik to secure these advantages..

The hypothesis is that the rapid increase in the capital of the Icelandic banks led them to “outgrow” Iceland; they re was

	2000	2001	2002	2003	2004	2005	2006	2007
GDP, ISKB	682	770	812	840	926	1022	1142	1250*
Bank Assets al	717	838	939	1240	1740	3126	5121	

If the advantage of these banks cannot be attributed to regulatory space, then it must be attributed to Icelandic firms. Foreign residents have been attracted to the high anticipated rates of return on the krona liabilities of the Icelandic banks. These non-Icelanders might have bought similar krona liabilities from these same banks in London or Luxembourg but the credit standing of these offshore liabilities of these banks is smaller than of their parents. . The advantages associated with Icelandic banks appear to be specific to their passports .

The Icelandic banks have understood that there is a large (especially relative to the size of the Icelandic economy) international market for high interest rate securities. These yield oriented investors—the somewhat derisory cliché is Belgian and Germany and Italian dentists—continued to buy Argentinean government bonds denominated in the US dollar in the late 1990s as interest rates increased from twelve to fifteen to eighteen percent; their obsession with the yield induced a myopia with respect to where the government in Buenos Aries would get the funds to pay the interest even though the government was borrowing the money.

The buyers of the liabilities of banks can be fickle friends—as shareholders of Bear Stearns have learned to their great cost. The Icelandic banks depend on the willingness of these investors to buy more of these liabilities when the existing liabilities mature. The banks must have back-up credit lines so they can maintain their loans in response to a decline in liabilities.

The Icelandic banks have used most of the money received from the purchases of these securities to pay for their purchases of banks and firms that sell financial services in Britain and Northern Europe. (If the foreign investments of the Icelandic banks had not increased at about the same pace as their sales of krona-denominated bonds, then Iceland would have developed a much much larger current account deficit.)

The Icelandic banks have incurred a currency risk since they have a liability denominated in the krona and an asset—and its counterpart income stream—denominated in the British pound or the Danish krona.. Moreover the banks have incurred an asset transformation risk, since their liability has a fixed interest payment while the income on the assets they have purchased is variable. Finally the Icelandic krona is a high interest rate currency compared with interest rates on the British pound and the Danish krona.

An apparent puzzle is why the Icelandic banks did not denominate the bonds in the currency of the country in which they wished to make their equity investment. For example, if one of the Icelandic banks had planned a purchase of a bank or a financial institution in Britain, then the Icelandic bank might have sold bonds denominated in the British pound; in this way, the bank would have avoided the currency risk.

The Icelandic banks concluded that it was advantageous to denominate the bonds in the Icelandic krona. It may be that the investor anticipation that the krona would continue to appreciate meant that interest rates were lower than they otherwise would have been. Or it may have been that there was a gain to be made when the banks hedged their foreign exchange exposure by purchases of the krona in the forward exchange market, since the forward rate for the krona might have been biased downward relative to the price of the krona in the spot exchange market on the dates that the forward exchange contracts matured.

It is too soon to tell whether the Icelandic's banks purchases of foreign banks and financial institutions will prove profitable for the shareholders of the banks and in the national interest of the Iceland the country; the two groups are only partially overlapping Most of the shareholders are Icelandic citizens, but only a few Icelandic citizens are shareholders.

The Icelandic banks purchases were made near or at “the top of the mark”; the price of stocks of the banks headquartered in different countries has declined with the global credit crunch. One of the stylized facts about international banks is that banks

that set up branches and subsidiaries in foreign countries often are at a cost-disadvantage relative to their host country competitors since they incur costs of monitoring lending activity at a distance. Moreover the costs of capital of the Icelandic banks probably are higher than the costs of capital of the banks they purchased and of their host competitors. (The Icelandic banks may serve the banking needs of Icelandic firms that have branches and subsidiaries, but it is not obvious that there is a cost advantage.) Icelandic banks need a compensating advantage or else they will be at a disadvantage relative to their host country competitors, they may have a cost advantage if their staffs are younger. And the Icelandic banks may have a compensating advantage in the form of the “Viking spirit”, although it is not clear how this plays out in the Norway and Denmark and Sweden.

The markets in bank loans and bank deposits in Iceland probably is less competitive than the markets in Britain and in the Scandinavian countries, at least as judge by the numbers of firms that compete for deposits and loans. There is a non-trivial possibility that the profits earned in Iceland would be used to subsidize their foreign activities. If the rate of return that the Icelandic banks earn on their foreign subsidiaries is below the interest costs, then some of the profits earned on their domestic banking operations will be allocated to the interest payments.

One problem raised by the large volume of foreign assets owned by the three Icelandic banks is that they The large volume of assets of the Icelandic banks relative to the country’s GDP presents several problems.

One is that a run on the Icelandic banks would lead to a run on the krona, even though the economic fundamentals of the country might be strong; interest rates on krona securities would be high. . Foreign owners of the banks krona liabilities would decide not to buy any more bonds when their current holdings of bonds mature.

## 7. POLICY ISSUES—THE UNWINDING OF AN IMPORTED ASSET BUBBLE

Two proposals are advanced in this section. The first centers on the structure of the financial institutions in Iceland and the advantages of establishing a new set of institutions that would focus on the management of the Iceland’s money supply and its payments system. The second highlights the most appropriate value for Iceland’s current account balance and hence for the krona .

The financial environment from 2002 to 2007 was characterized by declines in the price of risk or what is the same thing, increases in leverage, increases in the cross-border flows of funds, and increases in the prices of residential real estate. In contrast the global financial environment from 2008 is likely to be characterized by

increases in the price of risk and the reduction in leverage, reduction in cross-border flows of funds, and in many countries, declines in the price of real estate.

The first signs of the global “credit crunch” that is now underway in the United States, Britain, Ireland, and several other countries that experienced sharp increases in real estate prices between 2003 and 2007 centered on the failure of brokerage firms that originated mortgage loans and packaged these loans for sales to the investment banks. Three large firms—Bear Stearns, Countrywide Financial, Northern Rock—have failed. Numerous other firms—Merrill Lynch, UBS, AIG-- have reported very large loan losses. Estimates of the capital that banks and other financial institutions must raise to compensate for the losses on mortgages and mortgage backed securities range from \$400 billion to \$600 billion. The costs of capital to banks and other financial institutions will be significantly higher. Banks and other financial institutions will seek to recover the higher costs of capital through higher interest rates on their loans.

The increase in asset prices and household wealth in Iceland between 2002 and 2007 was larger in percentage terms than the comparable increases in most other countries. The likelihood that Iceland is likely to remain immune from the market forces that are leading to declines in the price of real estate and increases in the costs of capital in the United States, Britain , and other countries seems low.

Iceland is in a delicate and somewhat precarious financial situation because purchases of Icelandic securities by foreign investors have positioned the value of the krona that it cannot be sustained without continued purchases by the foreign investors at the same pace. The additional risk is that the problems of the foreign subsidiaries of the Icelandic banks would complicate the management of the money supply in Iceland.

The first proposal is to change the financial structure in Iceland to insulate the Icelandic money supply from any possible problems that the Icelandic banks as now structured might encounter. The proposal is that each of the three banks (hereafter the “parent firm”) now establish a new and separate corporation that would operate as a traditional commercial bank (hereafter the “narrow bank”). The demand and the savings deposits that each of the parent banks now has would be allocated to the narrow bank that each would establish, and the parent bank’s claims on the government sector and some of its most liquid and highest quality claims on the private sector would be allocated to the narrow bank. Some of the capital of each of the parent banks would be allocated to each of narrow banks so that once the change is implemented, the ratio of the capital to assets of the parent bank and of the narrow bank would not be significantly different.

Each the shareholders in the parent bank would receive shares in the narrow bank in proportion to shareholdings in the parent bank. None of the current shareholders in the existing banks would be adversely affected by the separation of the commercial banks from the investment banks.

Once the change is adopted, the parent bank would be like an investment bank, which would continue to own the foreign subsidiaries.

On day one the boards of the narrow banks would be identical with those of the parent bank. Good corporate governance procedures suggests that by the end of the first year, at least one-third of the members of the boards of the narrow banks not be members of the boards of the parent banks, and that by the end of the second year, at least two-thirds of the members of the boards of narrow banks not be members of the boards of the parent bank.

The second policy objective is to secure a significant reduction in Iceland's current account deficit or a modest current account surplus—say one to two percent of Iceland's GDP. As long as Iceland has a current account deficit, the foreign exchange value of the krona is dependent on the willingness of foreign investors to continue to add to their holdings of krona securities. The experience of many other countries suggests that these investors are “fair-weather friends”—they will continue to buy these securities when economic conditions are propitious, and then when there is a shock to the economy—a bad crop, a surge in import prices, an xx—they become much more sensitive to the risk of their foreign investments, and may sell some of their holdings in anticipation that the currency will depreciate—which then may become self-fulfilling.

The most plausible way to obtain a reduction in the foreign exchange value of the Icelandic kronor is for the Central Bank of Iceland to put its inflation target “on hold” for twelve to twenty four months. The inflation-targeting policy is pointless if the value of the current account deficit at the current value for the kronor is too large to be sustainable; only a “miracle” would enable Iceland to achieve a sustainable value for the current account at the prevailing value for the kronor. The likelihood that exports of aluminum could increase by the amount necessary to reduce the current account deficit to a sustainable value is trivially low.

Hence at some stage, a depreciation of the seems likely, and to a value not very different from the values—after adjustment for differences in inflation rates—that prevailed before the surge in the flows of foreign capital to Iceland. The depreciation of the Icelandic krona by twenty percent might be associated with a one time increase in the Icelandic price level by six to eight percent, on the assumption that imports are about twenty five percent of GDP.

Once the krona has depreciated to the level so that the current account balance is sustainable, then the Central Bank of Iceland could again adopt its inflation target.

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