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**PROSPECTS FOR A  
CURRENCY BOARD IN  
ICELAND**

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Johns Hopkins Institute for Applied Economics,  
Global Health, and Study of Business Enterprise



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# Prospects for a Currency Board in Iceland

By Alexander Mabie

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## About the Series

The *Studies in Applied Economics* series is under the general direction of Professor Steve H. Hanke, Co-Director of the Institute for Applied Economics, Global Health, and Study of Business Enterprise ([hanke@jhu.edu](mailto:hanke@jhu.edu)).

## About the Author

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## Abstract

In October 2008, Iceland suffered the biggest banking crisis in history relative to the size of an economy. Its three main banks, Glitnir, Kaupthing, and Landsbanki, were not able to avoid the deterioration in global financial markets following the September collapse of Lehman Brothers. Ever since, many economists have questioned whether a floating currency issued by the Central Bank of Iceland (CBI) is the most suitable monetary system for the Nordic island, or if it is time for Iceland to abandon the kroná (ISK) and adopt a new monetary regime. This paper examines the prospects of introducing several alternative monetary regimes in Iceland, namely a currency board system. In doing so, it presents a comparison of each regime's past performance in Iceland (if applicable) and elsewhere as well as each regime's potential effects on exchange rate dynamics. Lastly, it explores what might constitute an exchange rate that would be sustainable for a currency board.

## Acknowledgements

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Keywords: Iceland, financial crisis, currency board, dollarization, nominal GDP targeting  
JEL codes: E58

## **Introduction – The Unique Features of Iceland and its Economy**

To properly evaluate how various monetary systems would fare in Iceland, it is critical to understand something of the history of its economy and the unique features that developed as a result. With just over 300,000 inhabitants, Iceland is one of the smallest countries with an independent monetary policy. Iceland's economic track record has not been particularly good. It has been predominately characterized by high inflation, fluctuations in the exchange rate, and overall instability<sup>1</sup>.

Historically, abundant resources in two sectors – energy and marine – have fed the engine of Iceland's economic growth. The recently established aluminum smelting industry is the country's most power-intensive and contributes to Iceland's position as the world's largest electricity producer per capita<sup>2</sup>. Fisheries and related sectors are the most important part of the Icelandic economy, consistently contributing roughly a quarter of GDP. In recent decades, however, a third sector of substantial size emerged in Iceland: the financial sector.

Until the 1980s, the Icelandic government engaged in a high level of economic intervention. The three main banks were state owned, financial markets were tightly regulated, and there was a pegged exchange rate regime. Under the regime, the exchange rate was frequently adjusted so as to make profits in the fishing industry equal to zero<sup>3</sup>, which further emphasizes the industry's importance.

The 1990s represented a decade of bold, free-market reform. In 1994, Iceland joined the European Economic Area (EEA). The accession agreement essentially extended the freedom of movement of capital, labor, and goods and services afforded to members of the European Union to Iceland as well. Following this, the liberalization of financial markets accelerated. The government privatized state-owned companies, implemented person and corporate tax cuts, and deregulated the financial sector. Iceland's banks gained the right to open subsidiaries in any EEA country<sup>4</sup>. The result was a decade of robust economic growth, price stability, and low unemployment<sup>5</sup>.

### **I. Analysis of Iceland's Financial Crisis**

#### **How Did We Get Here? The Causes of Iceland's Financial Crisis**

There are two separate but related stories that characterize the build up to the crisis. The first is the rapid rise and fall of Icelandic banks. The second is Iceland's boom and bust cycle and how problems arose from severe macroeconomic mismanagement in a small, open, and financially

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<sup>1</sup> Sigurðardóttir (2012: ii).

<sup>2</sup> Iceland National Energy Agency (2014).

<sup>3</sup> Carey (2009: 6).

<sup>4</sup> Carey (2010: 6).

<sup>5</sup> Spruk (2010: 7).

integrated economy. These two episodes converged in a tragic grand finale in October 2008, when Iceland's three commercial banks collapsed and were put into receivership.

## **Overbanked**

The 1994 EEA agreement led to the privatization of Iceland's three largest banks, Glitnir, Kaupthing, and Landsbanki, by 2003<sup>6</sup>. It also allowed the banks to open subsidiaries in any EEA country, which constituted most of Europe. In addition to the favorable regulatory environment, the banks took advantage of easy monetary conditions abroad. For example, Landsbanki introduced an online savings account brand under the name Icesave, available to depositors in the United Kingdom and in the Netherlands. Icesave accounts were especially attractive because they offered unusually high rates of interest. Between 2006 and 2007, rates exceeding six percent were offered to UK customers<sup>7</sup>, which were among the highest offered by online banks at the time<sup>8</sup>. Kaupthing Bank offered similarly lucrative online savings accounts under the Kaupthing Edge brand. Meanwhile, on the lending side, the Icelandic banks were giving loans to Icelandic investment companies such as Baugur and Samson. These firms typically took equity stakes in foreign companies, indirectly exposing the Icelandic banks to global equity market risk<sup>9</sup>. As a result of the vast expansion both in Iceland and abroad, Deposit Money Banks (DMBs, which include the three main banks and other domestically registered banks) grew their total consolidated assets (including assets of banks' foreign subsidiaries) from 138 percent of GDP at the end of 2003 to 712 percent of GDP by the end of 2007 (Chart 1). The rapid expansion in assets included both domestic and foreign assets<sup>10</sup>.

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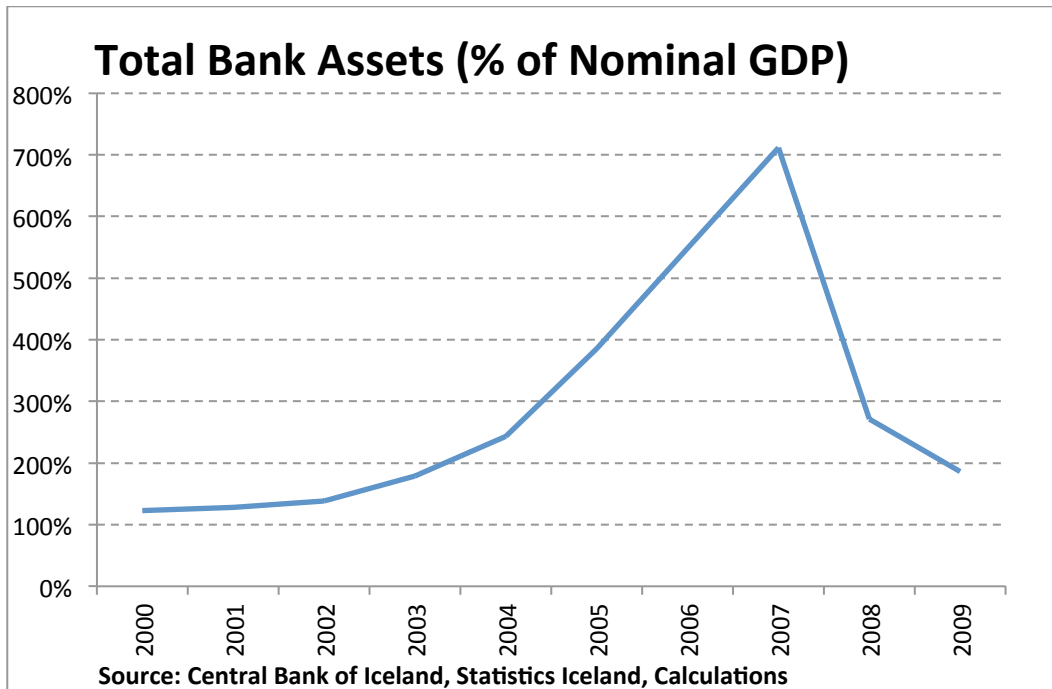
<sup>6</sup> Aliber and Zoega (2011: 27).

<sup>7</sup> Icesave (2008).

<sup>8</sup> Lewis (2006).

<sup>9</sup> Carey (2009: 8,9).

<sup>10</sup> Carey (2009: 7).



**Chart 1.**

The commercial banks' extreme growth essentially stripped the Central Bank of Iceland (CBI) of its capabilities to act as a lender of last resort. When banks' total assets exceed a country's GDP by several times, the central bank becomes unable to accumulate sufficient reserves to save them<sup>11</sup>. This problem was especially dangerous in Iceland, where the main banks were not systematically important in other countries<sup>12</sup>. Therefore, only the Icelandic government would potentially back the banks if they needed the support. So as Glitnir, Kaupthing, and Landsbanki grew huge in relation to the size of Iceland's economy, they rendered themselves too big to save.

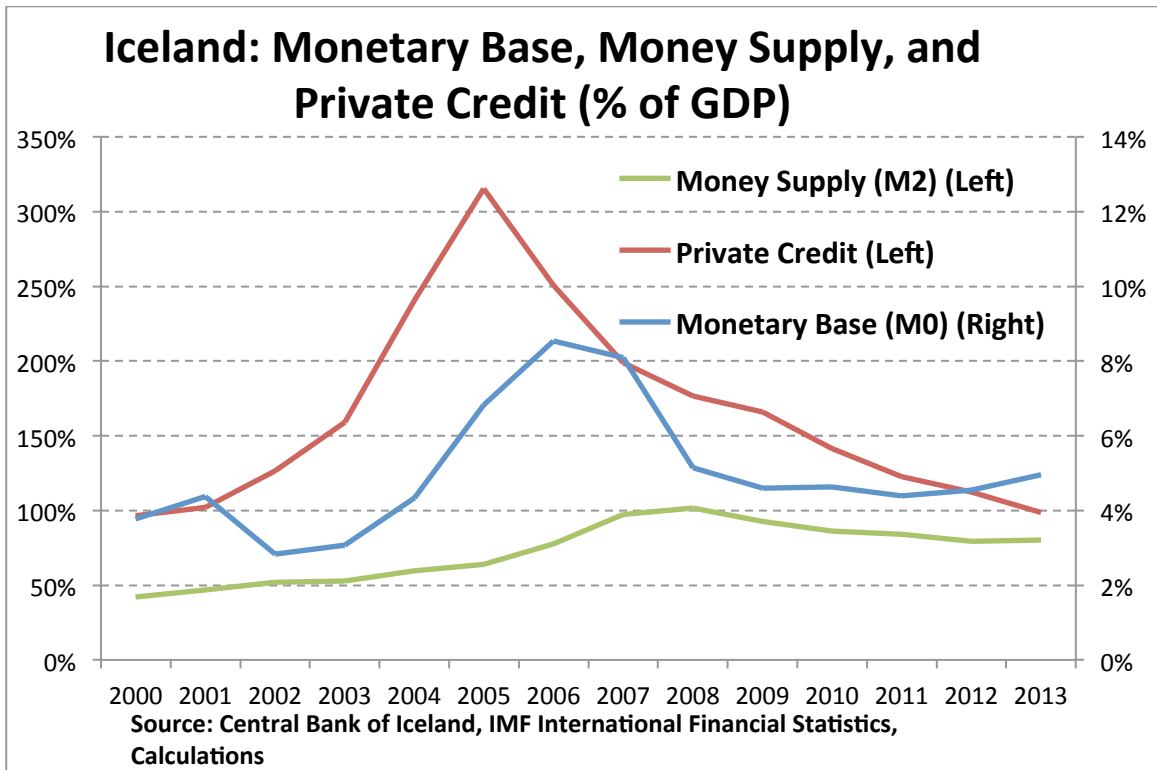
### **Overheated**

After the rapid expansion, a credit-induced asset price boom occurred. As the size of the banks skyrocketed, so did the amount of private credit. Domestic credit to the private sector as percentage of GDP grew from 102 percent in 2002 to 311 percent in 2006. The banks contributed to this significantly as they increased their market share. These high rates of credit put upward pressure on equity prices and house prices<sup>13</sup>. During the same period, the monetary base and money supply both climbed rapidly as well. The rapid growth of private credit, the monetary base, and the money supply are shown in the following chart (Chart 2).

<sup>11</sup> Aliber and Zoega (2011: 22).

<sup>12</sup> Carey (2009: 7).

<sup>13</sup> Carey (2009: 12,14).



**Chart 2.**

Iceland was experiencing an unsustainable domestic-demand boom, and the economy was showing serious signs of overheating. From 2003 to 2007, real GDP grew at an annual rate of 6.3 percent,<sup>14</sup> compared with an average of 2.8 percent over the previous 20 years<sup>15</sup>. In early 2006, unemployment stood at 1 percent, while wage growth hovered above 7 percent. The CBI had adopted inflation targeting in 2001, but changes in CPI accelerated to 5.2 percent on average from 2003 to 2007, roughly double the target rate<sup>16</sup>. During that period, the CBI continually raised interest rates until they reached double-digit levels<sup>17</sup> (Chart 3). These higher rates encouraged domestic firms and households alike to borrow in foreign currency. They also amplified the small, open economy's predisposition to currency speculation and carry trades against uncovered interest rate parity<sup>18</sup>.

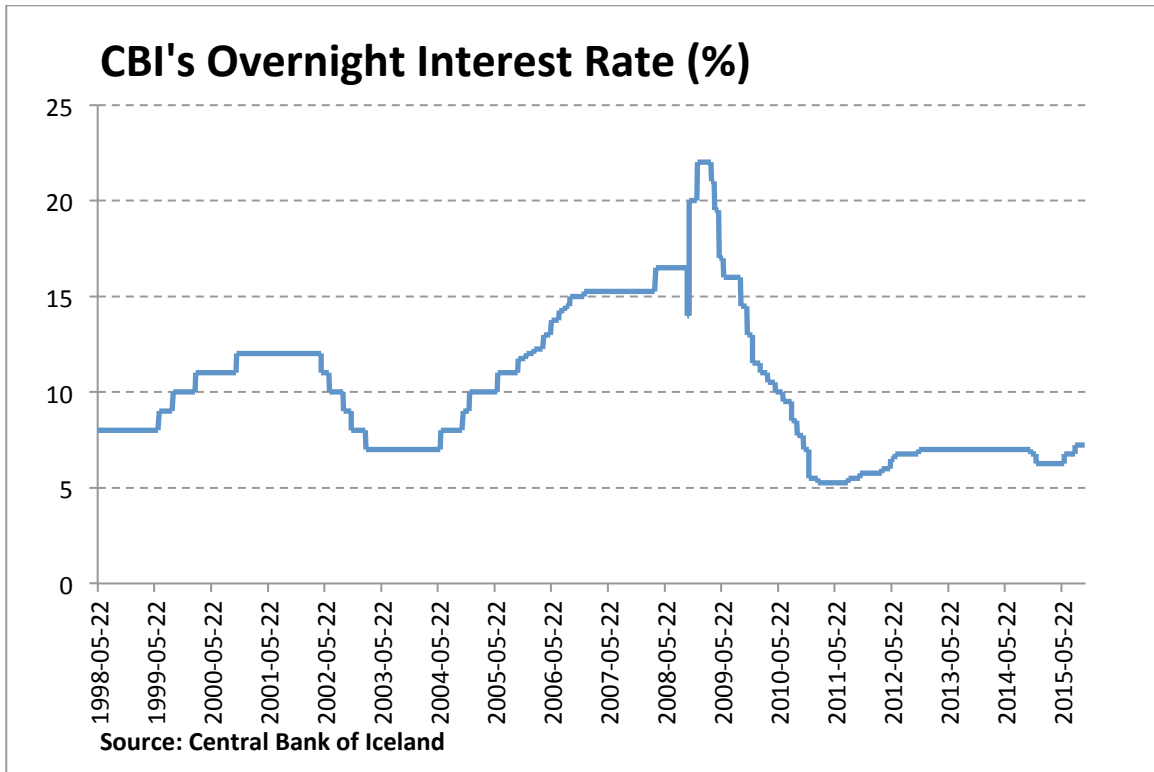
<sup>14</sup> Carey (2009: 21).

<sup>15</sup> Statistics Iceland (2015).

<sup>16</sup> Carey (2009: 26).

<sup>17</sup> Spruk (2010: 58).

<sup>18</sup> Spruk (2010: 8).



**Chart 3.**

The inflow of foreign investors' money led to a sharp increase in the value of the Icelandic kroná. As a result, imports rose dramatically relative to exports. The jump in imports was also driven by the surge in household wealth that formulated along with the boom in asset prices. A dramatic increase in Iceland's current account deficit accompanied the corresponding increase in its capital account surplus<sup>19</sup>. The current account deficit soared from 5 percent of GDP in Q3 2003 to 26 percent of GDP in Q4 2006 (Chart 4).

<sup>19</sup> Aliber and Zoega (2011: 5).

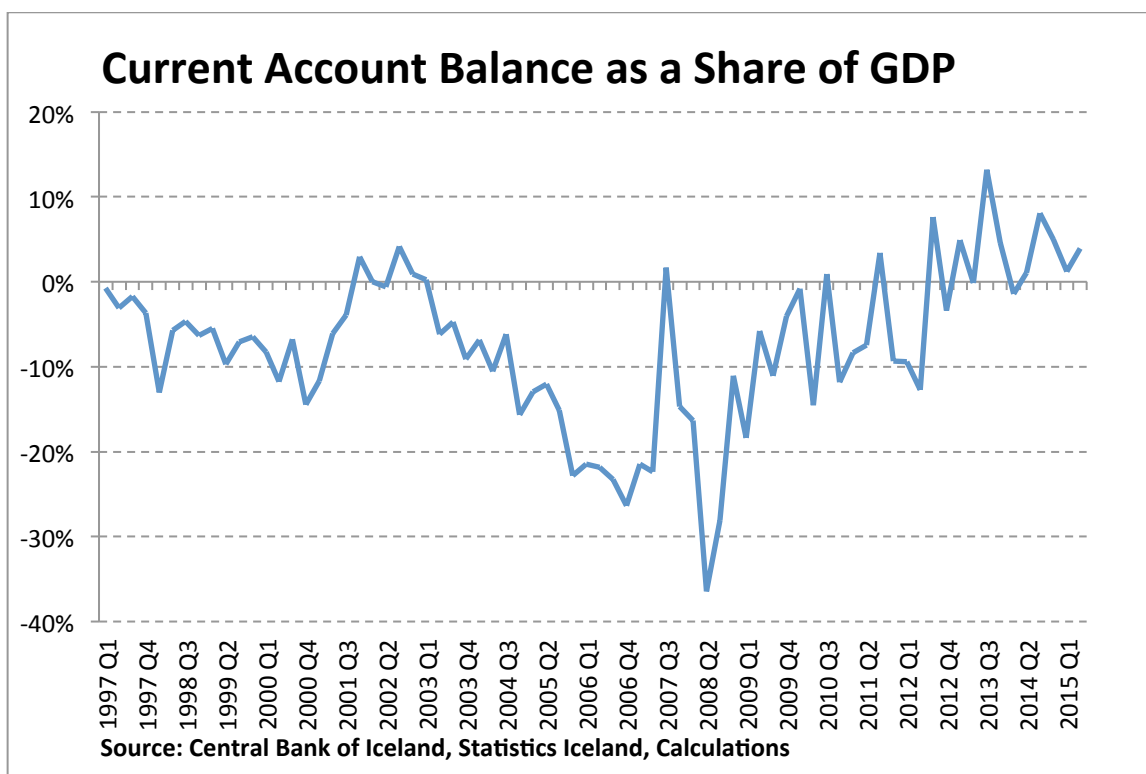


Chart 4.

## II. The Crisis and Its Effects

### Early Warning Signs

By 2005 and 2006, many analysts and hedge funds had taken note of the extreme overheating. Groups of hedge funds started to short the kroná and take out credit default swaps (CDSs) on the Icelandic banks' debt obligations<sup>20</sup>. Essentially, the funds were betting on a plummeting kroná and the collapse of Iceland's banking system. Merrill Lynch voiced similar concerns over the potential risk of a systemic failure in Iceland's financial sector<sup>21</sup>. Danske Bank soon published a research report terming Iceland's situation a Geyser Crisis, adding that Iceland was essentially cut off from international capital markets and exceptionally vulnerable<sup>22</sup>.

### Collapse

In early 2008, the huge capital inflow that characterized the several years prior made an about-face. The carry trade that had helped limit inflation by propping up the kroná reversed<sup>23</sup>. The value of the kroná continually fell over the course of the year as large financial institutions worldwide toppled. When Lehman Brothers went bankrupt in September, Iceland's banks were

<sup>20</sup> Bergmann (2014: 90).

<sup>21</sup> Thomas (2006).

<sup>22</sup> Valgreen, Christensen, Andersen, and Kallestrup (2006).

<sup>23</sup> Bergmann (2014: 97).



pushed to the brink of collapse, hinging on the prospects of a government bailout. On October 6, Iceland's prime minister announced that the banks could not be saved. The entire financial system collapsed over the next three days.

### **III. Effects of the Crisis**

#### **Help from Abroad**

Immediately, a widespread sense of economic uncertainty came over the entire Icelandic public. Iceland needed foreign funding to prevent the economy from completely derailing. The government swallowed its pride and accepted emergency loans from the IMF. The program provided a total of \$5.1 billion in financing (about 7 percent of GDP). Of that amount, \$2.1 billion came from the IMF, and the remainder came from the Nordic states and Poland<sup>24</sup>.

#### **Capital Controls**

Still, Iceland faced a serious problem in the stabilization of its exchange rate. The emergency loan program allowed Iceland to rebuild its foreign currency reserves. At the same time, however, taking on the loans complicated re-entry to international capital markets. In the autumn of 2008, foreign investors were holding high-yielding kroná-denominated bonds that amounted to 40 percent of GDP<sup>25</sup>. The bonds were known as "glacier bonds," and were issued by other European banks that used Icelandic banks to exchange their kroná for foreign currency<sup>26</sup>. Creditors and carry traders sought to convert these assets to assets denominated in stronger currencies. This would put severe downward pressure on the kroná, and thus the implementation of capital controls was deemed necessary. The controls were introduced in November and were meant to prevent serious deficiencies in Iceland's balance of payments without the overreliance on the interest rate tool<sup>27</sup>. A large gap quickly developed between the onshore and offshore rates for the kroná.

### **IV. Alternative Monetary Regimes**

In June of 2015, the Icelandic government announced plans to lift capital controls. Especially considering that, since Iceland became independent in 1944, it has never truly had a sustainable monetary regime—one that has produced low inflation and a credible currency over a long period—it is relevant to ask what money policy would be most viable once the controls are fully lifted.

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<sup>24</sup> Bergmann (2014: 157).

<sup>25</sup> Bergmann (2014: 156).

<sup>26</sup> Bergmann (2014: 80).

<sup>27</sup> Gudmundsson (2010: 1).

## **Goals of Monetary Policy – Conditions for a strong monetary regime**

It is useful to identify the objectives of monetary policy and its limitations before prescribing a specific monetary regime. “Monetary policy can only affect the nominal variables in the long term. This implies that monetary policy is unable to maintain higher growth or employment than the underlying structure of the economy allows at any given time”<sup>28</sup>.

Economist Lars Christensen, who warned of the Geysir Crisis two years before it occurred, echoes this sentiment in his assertion the primary goal of a monetary policy regime should be to achieve “nominal stability.” Since the central bank controls the monetary base, but commercial banks can create money as well, the central bank only has indirect control over the entire money supply. But overall, the central bank can control the nominal pieces of the economy. While monetary policy can significantly impact economic growth in the short run, it cannot stimulate long-term economic growth. However, because a central bank has the ability to control inflation, it can control nominal GDP<sup>29</sup>.

Christensen also echoes the sentiments of the late Milton Friedman, arguing that monetary policy should work “as a computer.” This means it should rely on minimal discretionary decision-making and should be rule-based. Monetary policy should be predictable and transparent. It shouldn’t distort economic decision-making or relative prices in the economy. Rather it should set the level of nominal demand and nominal spending in the economy by setting the money base<sup>30</sup>.

All central banks have the same and only ultimate policy instrument: the monetary base. Intermediate targets, such as interest rates, the exchange rate, or the broad money supply can be used to reach an ultimate target. A central bank’s ultimate target can be the inflation rate, the price level, or the nominal GDP level. However, the central bank is limited by The Tinbergen constraint. This says that in economic policy, the number of tools must be equal to the number of targets<sup>31</sup>. For central banking, this implies that there can only be one policy target, since the monetary base is the only available instrument.

## **V. Monetary Regime Choices – Sovereign Monetary Policy versus “Outsourcing”**

### **Sovereign Monetary Policy**

Iceland has the option to maintain its own currency and its floating exchange rate (managed exchange rate) and hit nominal targets while continuing to have a sovereign monetary policy. Three possible ways of doing so are inflation targeting, price level targeting, and nominal GDP targeting.

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<sup>28</sup> Central Bank of Iceland (2001b: 40-45).

<sup>29</sup> Christensen (2015).

<sup>30</sup> Christensen (2015).

<sup>31</sup> Tinbergen (1952: 1).

## Inflation targeting

The first sovereign monetary policy choice for Iceland is inflation targeting. Under inflation targeting, the central bank selects an explicit target or a narrow band for the inflation rate. The assumption is that price stability is the optimum way that monetary policy can support long-term economic growth. Inflation targeting uses the interest rate tool to expand or contract the monetary base based on below-target or above-target inflation.

Two conditions are required for inflation targeting to have a chance of coming close to its target consistently. First, the central bank must be free from government impositions and fiscal policy considerations. The central bank needs the ability to choose the instruments necessary to achieve the desired rate of inflation. Second, the monetary authority must adhere to the Tinbergen constraint and refrain from targeting other indicators such as wages, the unemployment level, or the exchange rate<sup>32</sup>.

Those in favor of inflation targeting praise the policy for its inherent transparency. Monetary authorities in countries that employ inflation targeting often engage in formal communication with the public regarding their views on inflation and monetary policy. Proponents such as Ben Bernanke argue that this transparency promotes stable and noninflationary economic growth by reducing uncertainty among businesses and consumers about future interest rates and inflation<sup>33</sup>.

Inflation targeting has been in place in Iceland for roughly fifteen years. Overall, the experience has been less than successful. The CBI gained its independence in 2001 and put in place an inflation target of 2.5 percent<sup>34</sup>. That same year, the CBI and Icelandic government abandoned the use of the ISK's exchange rate as the intermediate target and nominal anchor for monetary policy<sup>35</sup>. The ISK was allowed to float freely, and the deviation bands that had been in place in the past were completely removed<sup>36</sup>. It was thought that if inflation would stay close to the target, the exchange rate would be more stable. When the fixed exchange rate regime was abolished, the CBI and Icelandic government expected substantial fluctuations in the ISK. However, the ISK depreciated by over 16 percent for the first six months of 2001 – much more drastically than expected<sup>37</sup>. The CBI failed to consistently keep inflation within the tolerance interval between 2001 and 2011 (Chart 5).

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<sup>32</sup> Jahan (2012).

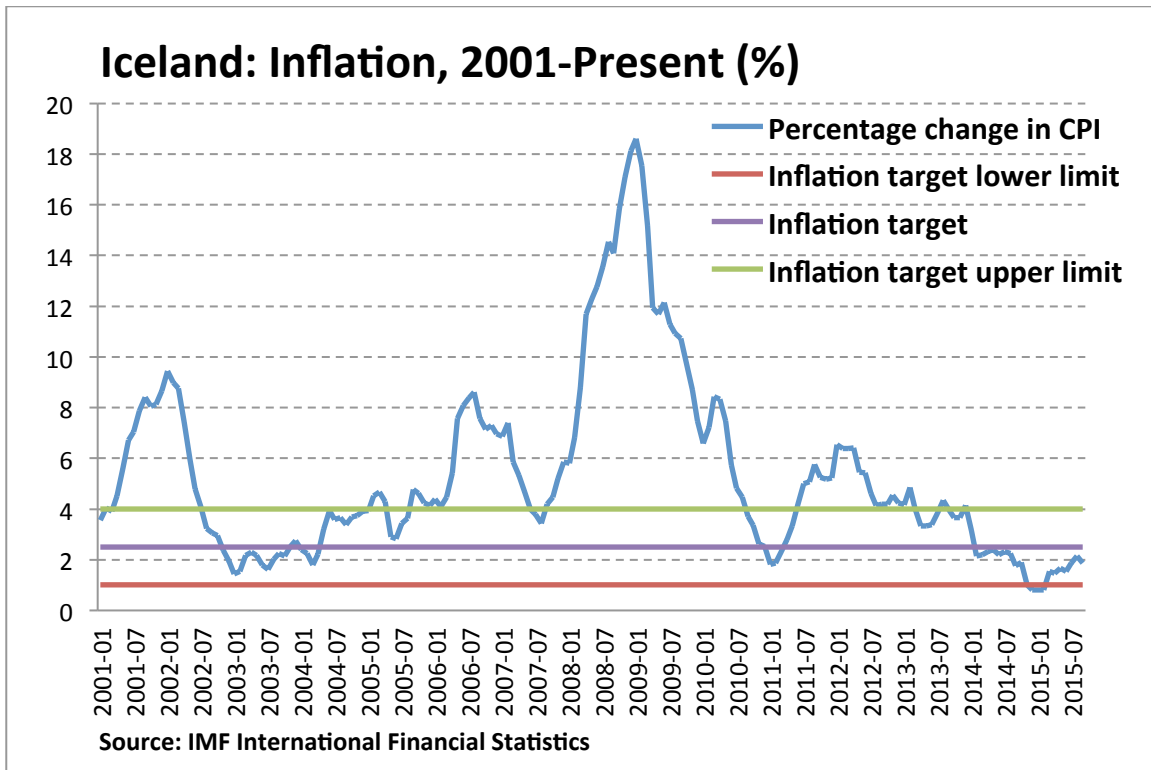
<sup>33</sup> Hoy (2005).

<sup>34</sup> Sigurðardóttir (2012: 17).

<sup>35</sup> Central Bank of Iceland (2001b: 40-45).

<sup>36</sup> Sigurðardóttir (2012: 17).

<sup>37</sup> Central Bank of Iceland (2001a: 57-62).



**Chart 5**

Under inflation targeting, it is difficult to stay within a narrow band but possible to be on target over the medium term. Still, the policy has proved relatively successful for economies small and large. As can be seen in the charts below, Canada (Chart 6) and Norway (Chart 7) among others have been fairly successful in keeping inflation within their control ranges. Particularly, inflation targeting has served the Canadian economy well. Since the adoption of the monetary policy in 1991, inflation has averaged 2 percent. The Bank of Canada says that this has given clarity to consumers and business regarding their future purchasing power<sup>38</sup>. Additionally, economies of similar size to Iceland such as Albania, Moldova, and Paraguay have kept their rates fairly close to their targets since they established inflation targeting regimes. Chart 8 shows Albania’s historical inflation rate since the establishment of an inflation targeting regime. Charts for Moldova and Paraguay can be found in the accompanying spreadsheet workbook.

**Price level targeting**

A policy closely related to inflation targeting is price level targeting. The price level can be set once and for all, or more likely it can be allowed to increase by, say, 2 percent a year. Unlike inflation targeting, which lets bygones be bygones, price level targeting requires the central bank to compensate for past misses in the target. Hence it may promote greater long-run certainty about the price level than inflation targeting does. Price level targeting is currently a purely theoretical system; no central bank adheres to it.

<sup>38</sup> Bank of Canada (2011).

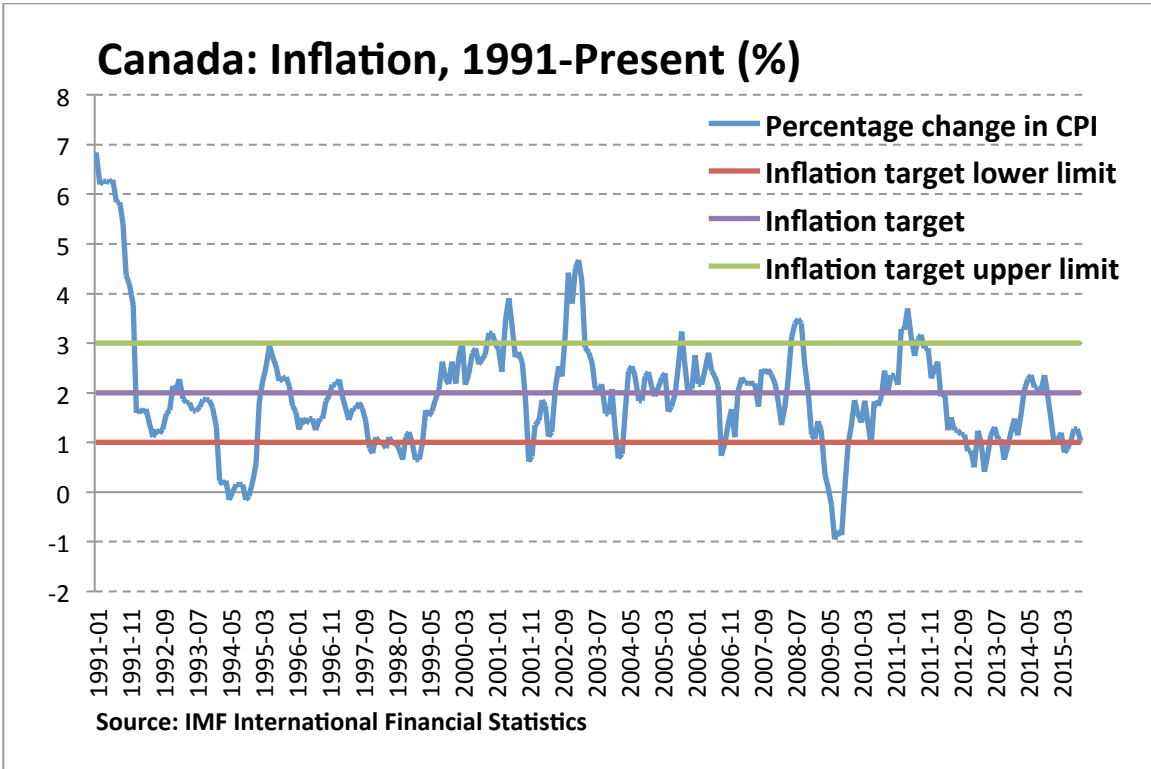


Chart 6

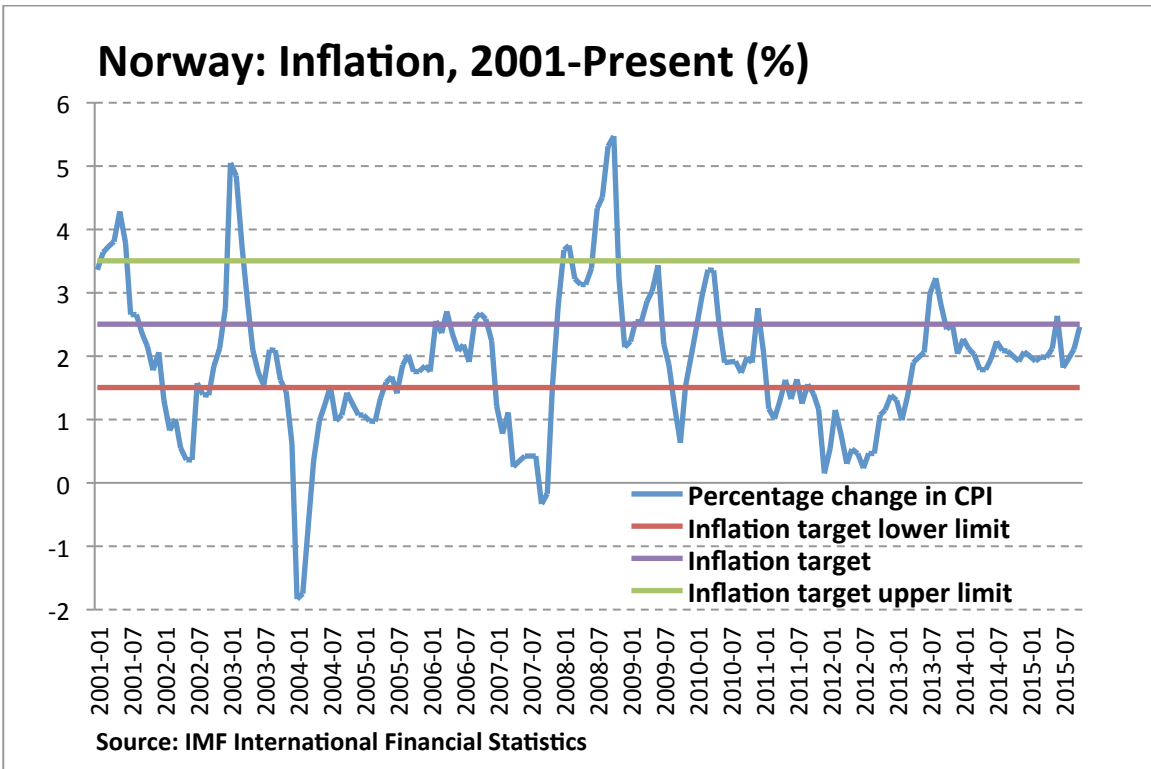


Chart 7

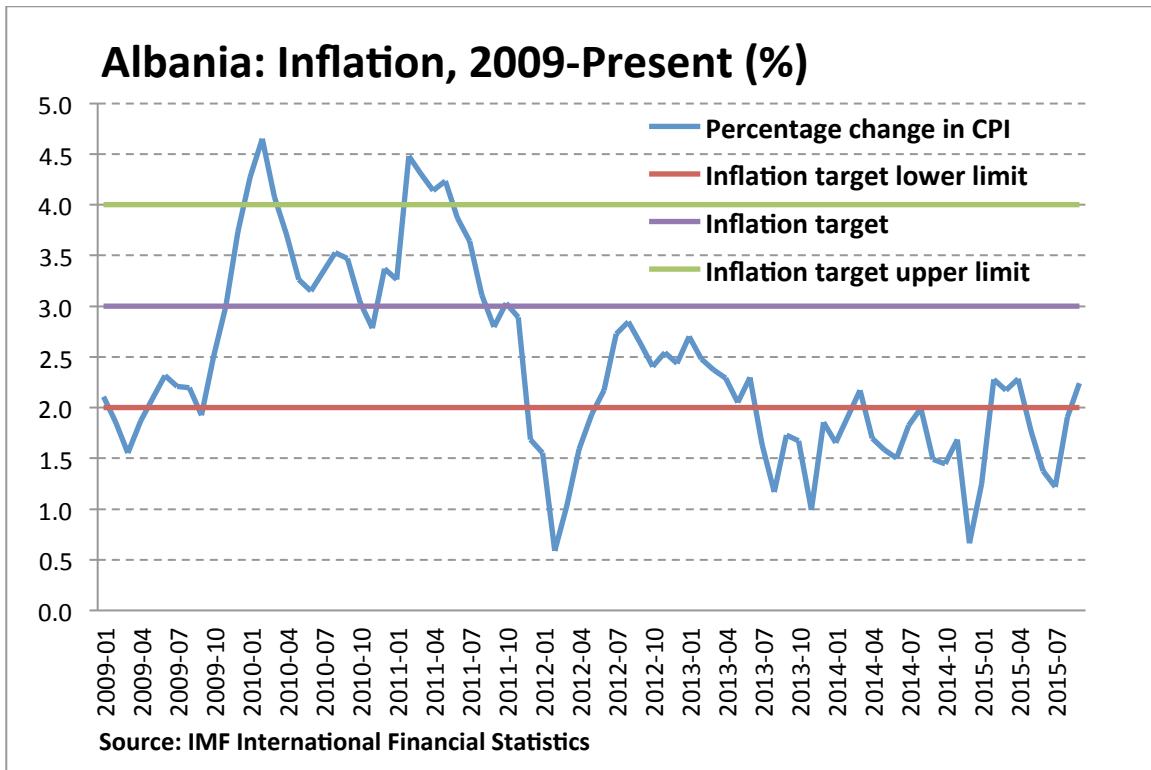


Chart 8

### Nominal GDP targeting

Another option for a sovereign monetary policy is nominal GDP (NGDP) targeting. In this system, the central bank chooses to target a growth rate of nominal GDP for a given period. In developed countries, this rate would likely hover between 4 and 5 percent annually. The monetary authority then simply loosens or tightens as needed in order to hit the target using the same short-term interest rate tool that it uses in inflation targeting. If expected nominal GDP is sluggish, the central bank eases. It does the opposite if expected nominal GDP is too high. If nominal GDP falls below the target growth rate in one year, the central bank compensates for that in the following years, setting an overall path for nominal spending. Year to year, the breakdown of inflation and real GDP growth would differ<sup>39</sup>.

NGDP targeting has grown in popularity within the academic community in the wake of the 2008 financial crisis. This group of economists has spawned the development of a school of macroeconomic thought known as “Market Monetarism”. Prominent individuals include Scott Sumner (2015) of Bentley University and Lars Christensen, a former economist at Danske Bank.

Sumner and Christensen share the view that NGDP targeting achieves macroeconomic stability more effectively than other monetary policies. According to Sumner, It dominates inflation targeting because it is robust to supply shocks. He gives the example of an oil embargo in the

<sup>39</sup> Economist (2011).

Middle East that reduces a country's oil imports by 10 percent and raises the price of oil by 60 percent. Under inflation targeting, the country's central bank would have to tighten money in order to lower non-oil prices to achieve the overall level of CPI in check<sup>40</sup>. However, under NGDP targeting, such tightening is not necessary given that nominal GDP is in line with the target<sup>41</sup>.

Christensen has explained how pre-crisis Iceland would have fared under a NGDP targeting regime. He notes that if NGDP targeting had been in place between 2003 and 2004, the CBI would have noted a dramatic acceleration in nominal GDP. This would have been a signal for the CBI to substantially tighten monetary policy. However, at the time, the CBI was targeting the rate of inflation. The artificially strong kroná acted to subdue inflation and therefore sent the wrong signal on the need for monetary accommodation. While it wouldn't have completely saved Iceland from the crisis to come, NGDP targeting would have tightened monetary policy earlier and perhaps reduced the crisis's overall damage to the Icelandic economy<sup>42</sup>.

No country has formally adopted a strict NGDP targeting policy yet. However, there has been some central bank discussion surrounding the topic. For example, the Bank of England hinted at the emphasis that it places on nominal GDP in 2011<sup>43</sup>. In a letter to the UK Chancellor George Osborne, Bank of England Governor Sir Mervyn King noted the following regarding above-target inflation:

There is, however, a limit to what monetary policy can do when large real adjustments are required. And it cannot influence inflation over the next few months. But it can ensure that the adjustment takes place against a backdrop of low inflation in the medium term. In so doing, monetary policy will make the best contribution it can to high and stable levels of growth and employment.

King essentially implies that the Bank's priority was growth rather than inflation. Additionally, the Federal Open Market Committee of the U.S. Federal Reserve briefly discussed the possibility of NGDP target in September 2010<sup>44</sup>. These instances reflect that rich, developed economies recognize the merits of NGDP targeting. It follows that this monetary regime option is worth considering for Iceland.

## **Outsourcing**

Alternatively, Iceland could outsource its monetary policy. There are several reasons why it is natural to consider this option for Iceland. Outsourcing monetary policy is very common for small, open economies such as Iceland. Finland, Denmark, Holland, and Switzerland have each anchored their exchange rates to more stable currencies in various ways.

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<sup>40</sup> Sumner (2014: 324).

<sup>41</sup> Christensen (2015).

<sup>42</sup> Christensen (2015).

<sup>43</sup> Warner (2011).

<sup>44</sup> Federal Reserve Board of Governors (2010: 7).

Moreover, Iceland has a track record of imprudent monetary policy. Rampant inflation in the 1970s and 1980s crippled the country's economic situation. Icelandic monetary policy has also been heavily politicized. This has essentially extended a helping hand from the central bank to the government. If monetary policy is outsourced, by default it also becomes depoliticized and an environment is created that fosters fiscal discipline. Denmark and the Baltic states present good examples of this<sup>45</sup>.

Last, there is merit to the fact that outsourcing monetary policy strips the monetary authority of any discretionary decisions making. In all too many countries, discretionary monetary policy very rarely achieves positive long-term effects. Rather, it only gives central banks the ability to make impulsive and unpredictable policies<sup>46</sup>. Perhaps the most blatant example of this in Iceland occurred just days prior to the collapse of the banks. On October 7, 2008, the CBI published a press release announcing that the ISK was to be pegged to the euro at 131<sup>47</sup> compared with the previous day's closing market rate of 155<sup>48</sup>. The move completely threw off the market and caught investors by surprise. The CBI abandoned the peg the next day as investors remained unconvinced of its ability to be maintained<sup>49</sup>.

### **Pegged exchange rate**

The first outsourcing option for Iceland might be to simply peg the exchange rate to another currency or basket of currencies. Iceland has experimented with the type of monetary regime in the past, and the experience was not exactly good. The ISK was established in 1886 and pegged to the Danish crown (DKK) until 1922 and then again from 1933 to 1939. Since 1939, the ISK has depreciated 99.5 percent against the DKK<sup>50</sup>.

Additionally, there is little theoretical merit for introducing a pegged exchange regime in any economy. Unlike the floating exchange rate that exists under the aforementioned sovereign monetary policies, a pegged exchange rate (as opposed to the fixed exchange rate of a currency board, described below) lacks the fully automatic mechanism to adjust to fluctuations in the balance of payments. A central bank is required to monitor both the exchange rate and monetary policy, which violates the Tinbergen constraint<sup>51</sup>.

Furthermore, in a pegged exchange rate regime the monetary base comprises both domestic and foreign pieces. This creates a conflict surrounding the simultaneous management of the exchange rate and monetary policy. For example, in the instance of excessive capital inflows, as was the case in Iceland prior to the crisis, a central bank will often engage in tight monetary

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<sup>45</sup> Christensen (2015).

<sup>46</sup> Christensen (2015).

<sup>47</sup> Mason (2008).

<sup>48</sup> Central Bank of Iceland (2015).

<sup>49</sup> Brogger and Einarsdottir (2008).

<sup>50</sup> Sigurðardóttir (2012: ii).

<sup>51</sup> Hanke (2008: 277).



policy to reduce the domestic component of the monetary base. As the central bank continues to compensate for changes in the foreign component of the monetary base by adjusting the domestic component, currency speculators are likely to notice the discrepancies between exchange rate and monetary policies<sup>52</sup>.

A pegged exchange rate also forfeits the ability to absorb shocks that a floating exchange rate regime achieves. The success of the pegged rates depends heavily on how closely the domestic business cycle mirrors that of the anchor country<sup>53</sup>. Iceland is known to experience extremely asymmetric shocks that come primarily from fluctuations in fishery prices and aluminum prices. It is difficult to find another fish and aluminum producing country with a stable currency to which Iceland can simply peg<sup>54</sup>. For this reason, Iceland needs a more structured, rule-based system if it wishes to outsource its monetary policy.

### **Currency board**

Another outsourcing option for Iceland is a currency board. An orthodox currency board typically issues notes and coins that are fully convertible to a foreign currency at a fixed rate of exchange. It holds anchor currency-denominated bonds and gold as reserves, which are set by law and equal at least 100 percent<sup>55</sup>. In this case, Iceland would maintain its own currency, but the kroná would be fully backed by a foreign currency reserve. It would always be able to convert ISK into the anchor currency<sup>56</sup>.

Therefore, the CBI would cease to exist in its present form. There would still be a physical kroná, but monetary operations would be fully independent of any policy decisions made in Iceland. This is one of the arguments that currency board proponents cite: a currency board is rule-based by nature. A monetary authority sets a fixed exchange rate, but it has no discretionary monetary powers. The money base is purely determined by market demand, which removes the conflicts that arise under a pegged exchange rate regime between exchange rate and monetary policies. As a result, there have only been instances of failed attempts at speculative attacks on currency board systems<sup>57</sup>.

The main argument against currency boards is that they remove a central bank and therefore there is no lender of last resort, the central bank's key role. As detailed earlier, Iceland actually experienced this circumstance when its banks collapsed in October of 2008. The CBI couldn't act as a lender of last resort to the banks that had liabilities in foreign currencies, because the CBI's foreign currency reserve was not large enough. Some argue that looking forward, Iceland will benefit from not having a lender of last resort because having one fuels the moral hazard

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<sup>52</sup> Hanke (2008: 278).

<sup>53</sup> Gudmundsson (2012: 63).

<sup>54</sup> Christensen (2015).

<sup>55</sup> Hanke (2002: 88).

<sup>56</sup> Christensen (2015).

<sup>57</sup> Hanke (2002: 91). The often-cited case of Argentina in 2001-02 had important differences with an orthodox currency board, and advocates of currency boards do not accept it as a clear example of a currency board failure.

and risk taking that placed the banks in their precarious 2008 positions<sup>58</sup>. Indeed, the main banking crises in the world have taken place in countries with central banks that abused the lender of last resort function<sup>59</sup>.

There have been several examples of currency boards in recent history. Hong Kong currently operates under a currency board, the Hong Kong Monetary Authority (HKMA), which was founded in 1993. Bulgaria employs a currency board system as well. Estonia and Lithuania each had a currency board until they adopted the euro.

Hong Kong has had particular success under the currency board system. It first established a currency board in 1935 but abandoned it in 1972 during the breakup of the Bretton Woods system of worldwide pegged exchange rates. After experiencing a decade of severe currency depreciation and volatility, Hong Kong reinstated its currency board in 1983. Since the reintroduction, HKMA's GDP growth has only had two negative years. The first came in 1998 as a result of the Asian crisis, and the second came in 2009 along with the Great Recession (Chart 9).

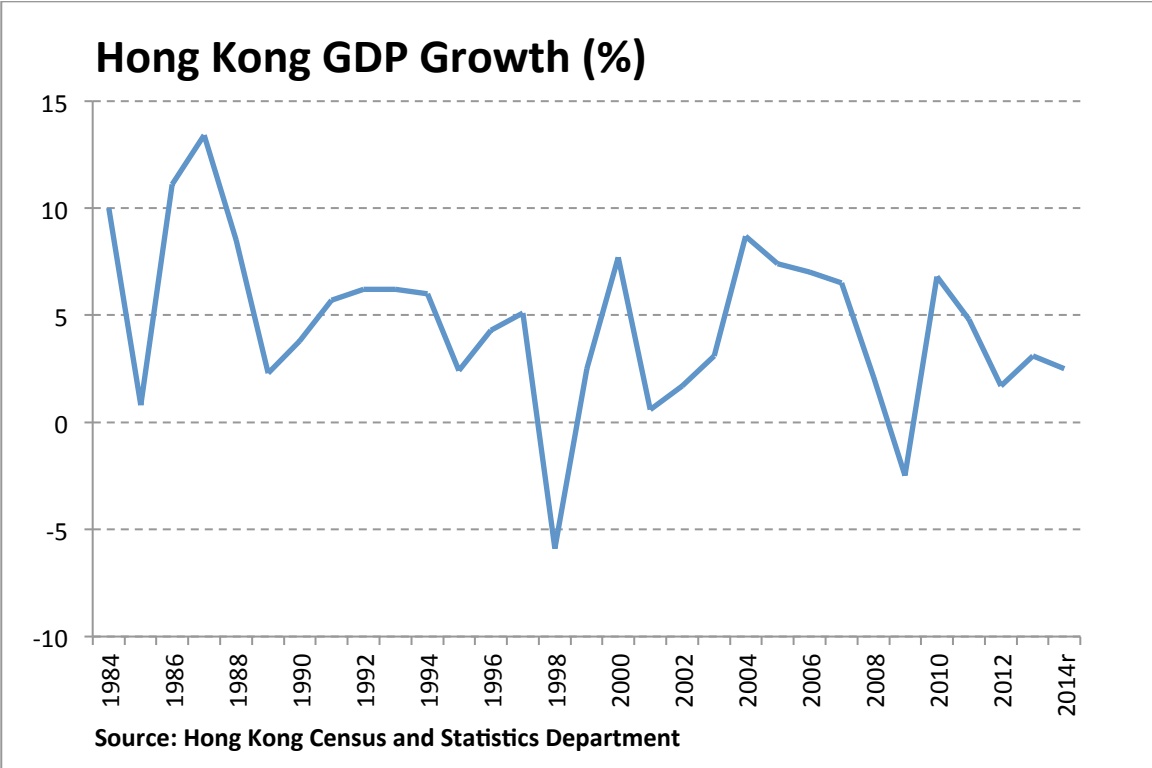


Chart 9

<sup>58</sup> Christensen (2015).

<sup>59</sup> Hanke (2002: 100).

## VI. Currency Board – Rates, Rules, and Evaluation

Among the monetary options with which Iceland has no historical experience, other writers have already considered nominal GDP in some detail. Let us therefore consider the currency board system. If Iceland were to introduce a currency board, what might it look like and how might it be instituted?

### Rates

What currency or basket of currencies would be a viable anchor for the ISK under a currency board system?

The most common choices for a reserve currency are the U.S. dollar, the euro, and the Japanese yen. The U.S. dollar has the advantage of a long track record of generally low inflation, low real interest rates, and overall credibility. Furthermore, many commodities and raw materials such as oil, natural gas, timber, and minerals are denominated in dollars. The euro is also a key currency of international trade and finance. It links foreign investments from countries in Eastern Europe, Russia, and Africa to Western Europe. The Japanese yen is the third most popular currency choice. While it is less central to international trade than the dollar or the euro, it is important in Asia and other countries as Japan's trade and investment have grown significantly since the 1980s<sup>60</sup>.

As mentioned earlier, Iceland would ideally choose a reserve currency whose country/countries and economy are similar to Iceland and its economy. Of the three currencies listed above, the euro seems to be the obvious candidate. The United States and Japan are very large economies that have minimal interaction with Iceland and experience different shocks to their business cycles.

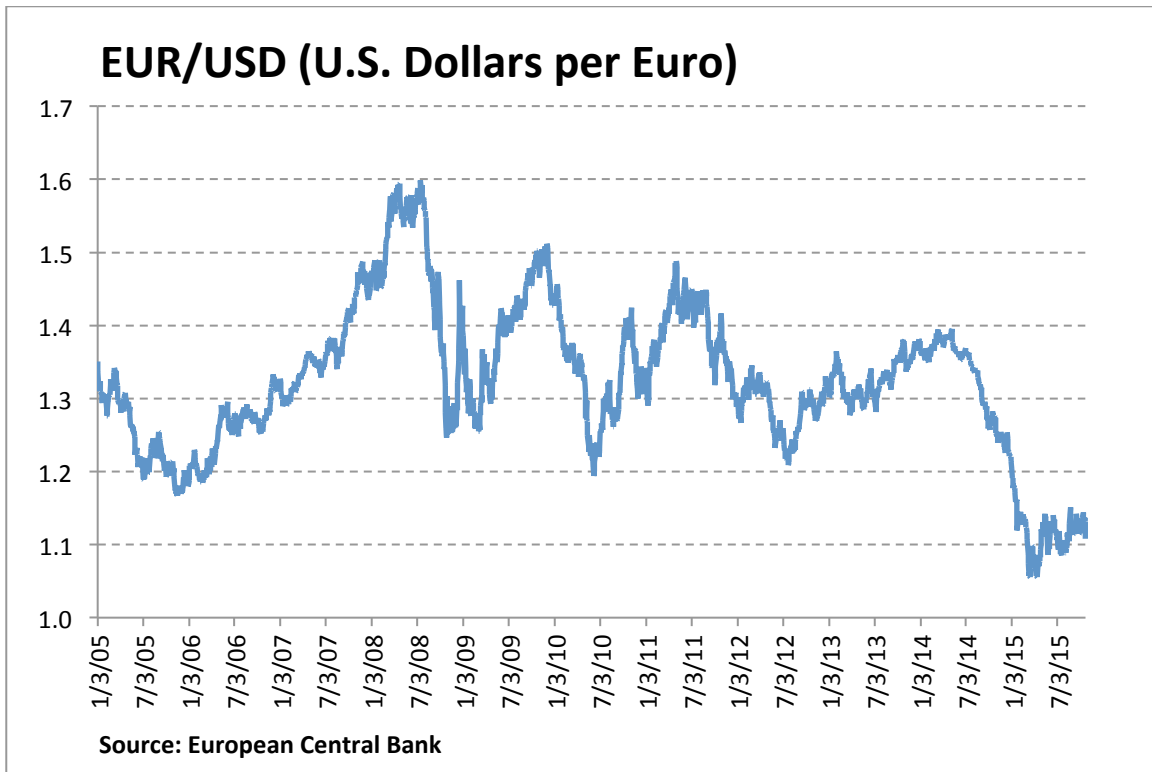
Therefore it might seem as though the euro would be the logical anchor for the ISK. After all, the euro plays the biggest part in Iceland's trade<sup>61</sup>. However, there are two problems that would arise if Iceland were to decide to join the eurozone in the short term.

The first has to do with the currency area's credibility. The current European debt crisis is an obvious threat to stability in the eurozone, with Greece's situation being of particular concern. Iceland would be assuming considerable risk if it anchored the kroná to the euro. Throughout the eurozone crisis, the euro has been extremely volatile. Over the past six years, the euro has depreciated 26 percent against the dollar (Chart 10). In the wake of its own currency crisis, Iceland needs a stable currency.

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<sup>60</sup> Hanke and Schuler (2015 [1994]: 52). The Chinese yuan is now challenging the yen in regional importance. Unlike the other currencies mentioned, the yuan is not fully convertible for capital account transactions.

<sup>61</sup> Sigurðardóttir (2012: ii).



**Chart 10**

Over the same period, monetary policy in Europe has actually been extremely tight. Despite very low rates, there has been essentially no growth in the monetary base and the broadly determined money supply (M3)<sup>62</sup>. This is largely a result of the strict capital requirements imposed by the Basel III accord. The new regulations have put a damper on bank money, which typically accounts for the majority of M3. Still, growth in the eurozone has a brighter future. The ECB's adopting of quantitative easing (QE) in March of 2015 has accelerated M3<sup>63</sup>.

The second issue is that the European Central Bank (ECB) has stated that "Iceland would not be able to adopt the EU currency without first becoming a member of the EU"<sup>64</sup>. The opinion polls in Iceland on the matter of EU membership show that this option is not feasible<sup>65</sup>. Therefore, a currency board that anchors to the euro is an option that Iceland should only consider in the long term. This would allow time both for Icelanders to warm up to the idea of EU membership and for QE to further boost money supply growth.

Given the situation in Europe, economists have suggested other currencies that Iceland might consider if it was to introduce a currency board. One of these is the Canadian dollar (CAD). In terms of the average shocks, the Canadian economy is actually similar to the Icelandic

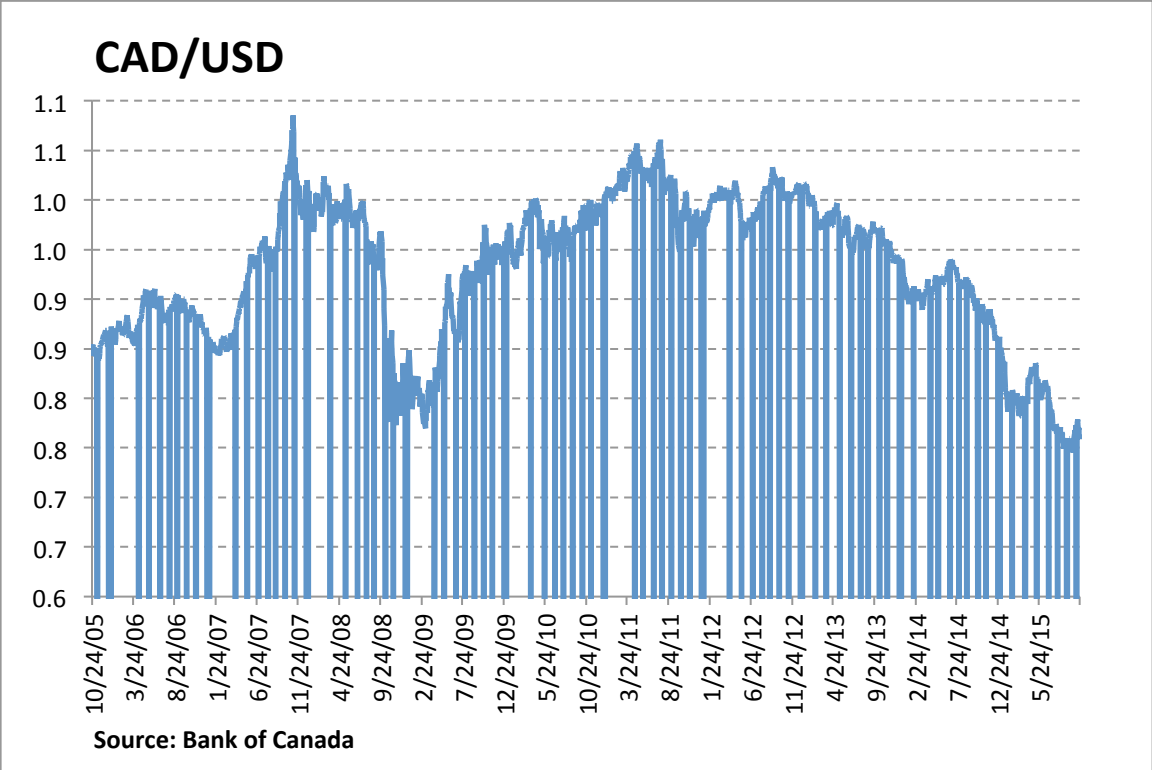
<sup>62</sup> Christensen (2015).

<sup>63</sup> Hanke (2015).

<sup>64</sup> IceNews(2008).

<sup>65</sup> Christensen (2015).

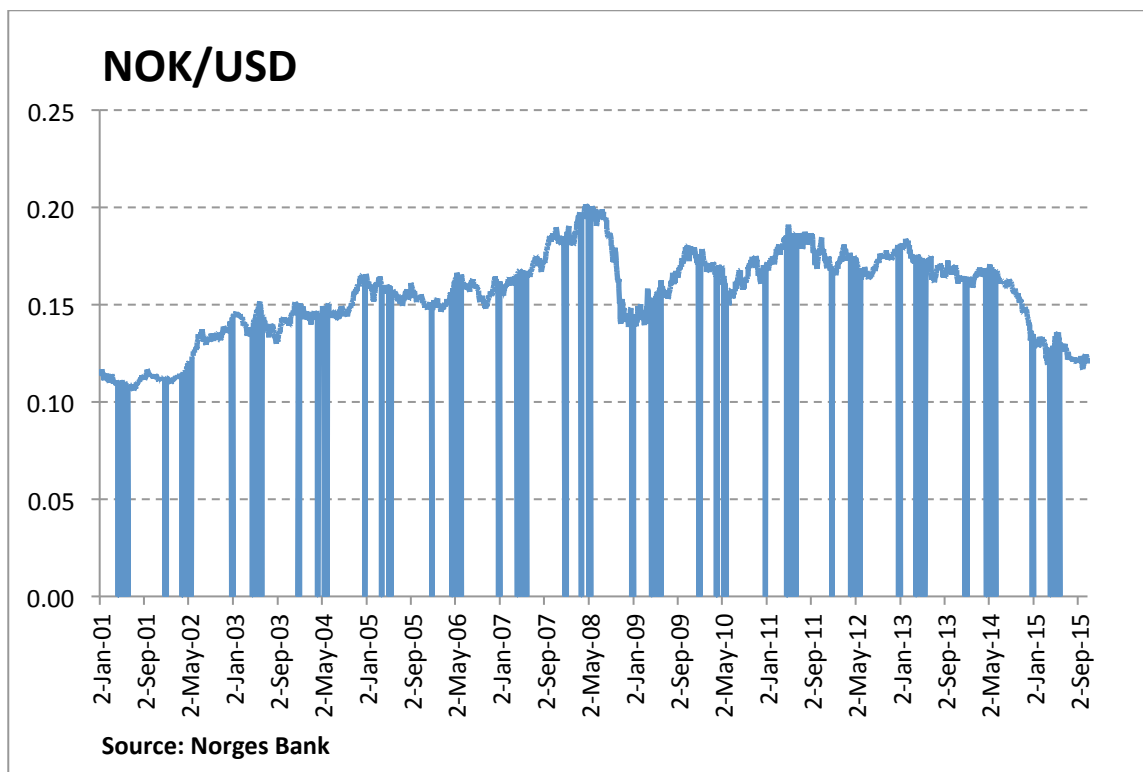
economy<sup>66</sup>. Canada’s extensive coastline contributes to it having the eighth largest commercial fishing and seafood industry in the world<sup>67</sup>. Additionally, cheap energy from hydroelectric power has fostered the growth of several important industries, including British Columbia’s large aluminum industry<sup>68</sup>. Also, the Bank of Canada seems to be a credible monetary authority, as the country has fared quite well under its inflation targeting monetary policy as noted earlier in this paper. Furthermore, the CAD has performed relatively well. During the same six-year period that the euro depreciated 26 percent against the U.S. dollar, the Canadian dollar only depreciated 5 percent (Chart 11).



**Chart 11**

The Norwegian krone (NOK) could also be a candidate anchor currency. Historically, Norway’s economy has been based largely on agriculture and fishing. Today, the country still has an abundant industry in cold-water fishing. It also is home to Norsk Hydro, one of the largest aluminum companies in the world. Like Canada, Norway operates under a flexible inflation rate targeting regime. The value of the NOK has remained stable since the implementation of inflation targeting in 2001 (Chart 12).

<sup>66</sup> Christensen (2015).  
<sup>67</sup> Fisheries and Oceans Canada (2011).  
<sup>68</sup> Canadian Manufacturing (2011).



**Chart 12**

Some economists have even proposed that Iceland use a basket comprising the CAD and NOK as its reserve currency<sup>69</sup>. However, using a basket of currencies reduces the transparency of the currency board to the public and therefore creates the potential risk of not achieving prompt credibility. A basket of currencies is also more expensive. Furthermore, each component of the basket could have large variability, which would undermine the goal of achieving lower variability with the basket as a whole<sup>70</sup>.

### Rules and Logistics

The conversion of the CBI to a currency board would be a relatively simple process. Furthermore, it should be the same regardless of the anchor currency that Iceland chooses, be it the CAD, NOK, the euro, or a different currency. Iceland would first need to phase out the CBI. It could do this by allocating the responsibility of regulating of commercial banks to the Icelandic Ministry of Finance and Economic Affairs. Iceland's commercial banks would then convert a portion of their required reserves into currency board notes and coins or into foreign securities depending on the banks' preferences. The remaining reserves could be disposed of.

<sup>69</sup> Christensen (2015).

<sup>70</sup> Hanke and Schuler (2015 [1994]: 53).

A necessary condition for the proper establishment of a currency board is that foreign reserves must equal 100 percent of the country’s notes and coins in circulation<sup>71</sup>. For Iceland, this means that the CBI’s net foreign assets would be at least equal to the monetary base. Indeed, this is the case, and has been the case in Iceland for nearly the past decade (Chart 13). Furthermore, the current ratio of both gross and net foreign assets to the monetary base in Iceland is 373 percent, well above the required minimum. Therefore, fully backing or converting the monetary base into foreign currency would prove little trouble for Iceland.

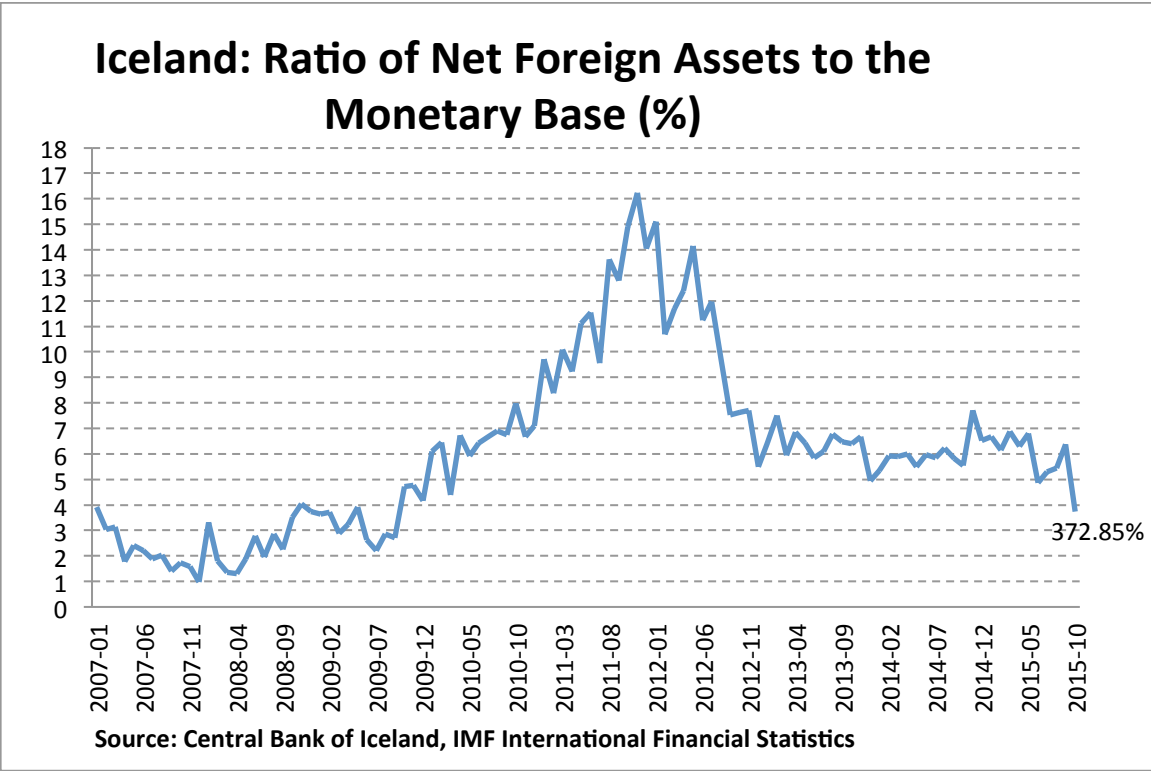


Chart 13

Another precaution during the conversion concerns interest rates. The following charts (Charts 14 and 15) demonstrate that nominal interest rates (both on loans and deposits) have been significantly higher in Iceland than in Canada and Norway. This is likely due to higher inflation expectations in Iceland. In the event that Iceland anchors the kroná to the Canadian dollar or to the Norwegian krone, which both have lower expected inflation, borrowers would face an added burden if no legal provision in place alters the rates or renegotiates the terms of the loans. Therefore, it is worthwhile to examine how Iceland might do this.

<sup>71</sup> Hanke and Schuler (2015: 47).

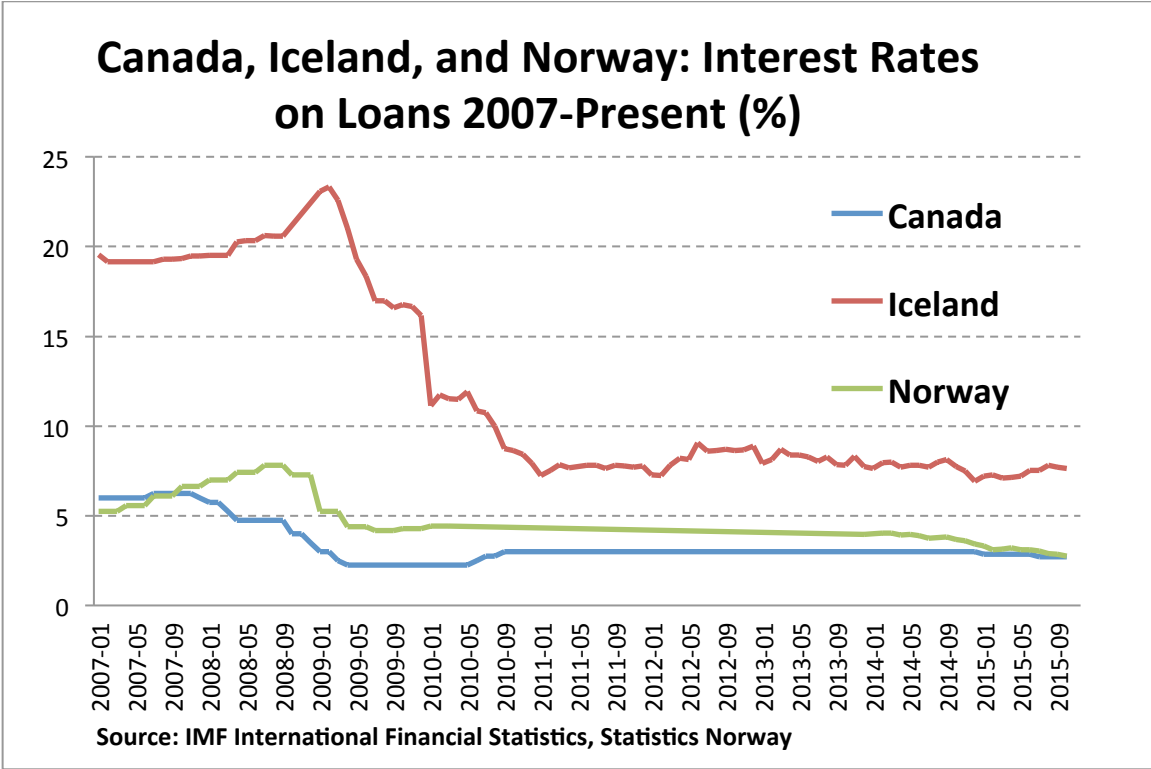


Chart 14.

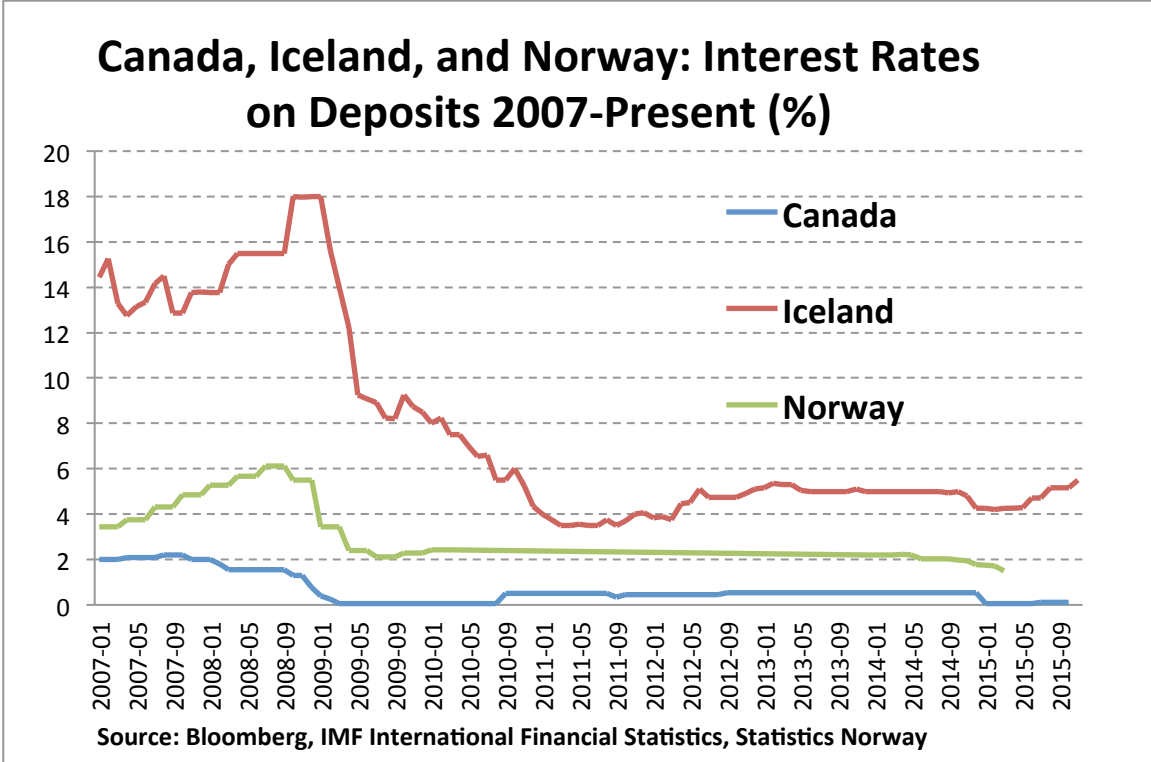


Chart 15.



One possible procedure for Iceland would be to reset the nominal interest rates so as to permanently lower their nominal values under the new currency board. Ecuador took such steps when they adopted the U.S. dollar as legal tender in 2000. Specifically, an Ecuadorian law established new reference interest rates. Iceland could feasibly implement a similar policy<sup>72</sup>.

For example, suppose that Iceland tries to establish a currency board using Norway’s currency, the krone, as the anchor currency. The first step of the procedure is to identify reference rates in both the current monetary system, such as the Reykjavik interbank offered rate (REIBOR), and in the Norwegian interbank offered rate (NIBOR). Next, reference rates are used to rescale interest rates on loans. The three-month REIBOR for October 2015 is 6.4 percent<sup>73</sup> and Iceland’s weighted average lending rate for October is 7.65 percent<sup>74</sup>. Therefore the interest rate on a loan in Iceland is 1.2 times the reference rate. The new reference rate, the three-month NIBOR for October 2015 in this case, is 1.11 percent. Simply applying this 1.2 multiplier to the 1.11 percent NEIBOR implies a new permanently lowered nominal interest rate on loans in Iceland of 1.33 percent. However, the Norwegian interest rate on loans for October 2015 is 2.75 percent<sup>75</sup>. Given Norway’s long track record of price stability, it is highly unlikely that rates in Iceland should be initially lower than those in Norway. Therefore, it may be suitable to include an adjustment factor of 3, which when multiplied by the 1.33 percent rate yields a 3.98 percent new nominal interest rate on loans. This presents a reasonable premium 45 percent over the Norwegian rate of 2.75 percent.

Since the kroná has been floating since 2001, there is no need to designate a deliberate period of unrestricted, free-floating exchange rates<sup>76</sup>. Rather, the average of the most recent 90 days’ trading exchange rates can be used to set the fixed rate of exchange with the anchor currency. This 90 day period is meant to replicate the typical period of unrestricted floating rates that most governments introduce when their central banks are converting to currency boards<sup>77</sup>. The 90-day average (ending December 1, 2015) CAD/ISK was 97.41. The corresponding NOK/ISK was 15.13 and EUR/ISK was 142.10. These values are shown in the table below and then in a respective contextual time series charts (Charts 16,17,18).

CAD/ISK	NOK/ISK	EUR/ISK
90 DAY AVG	90 DAY AVG	90 DAY AVG
97.4136508	15.307127	142.0914286

Source: Central Bank of Iceland

<sup>72</sup> Beckerman (2001: 27).  
<sup>73</sup> Central Bank of Iceland (2015).  
<sup>74</sup> IMF International Financial Statistics (2015).  
<sup>75</sup> Oslo Bors (2015).  
<sup>76</sup> Hanke and Schuler (2015 [1994]: 46).  
<sup>77</sup> Hanke and Schuler (2015 [1994]: 46).

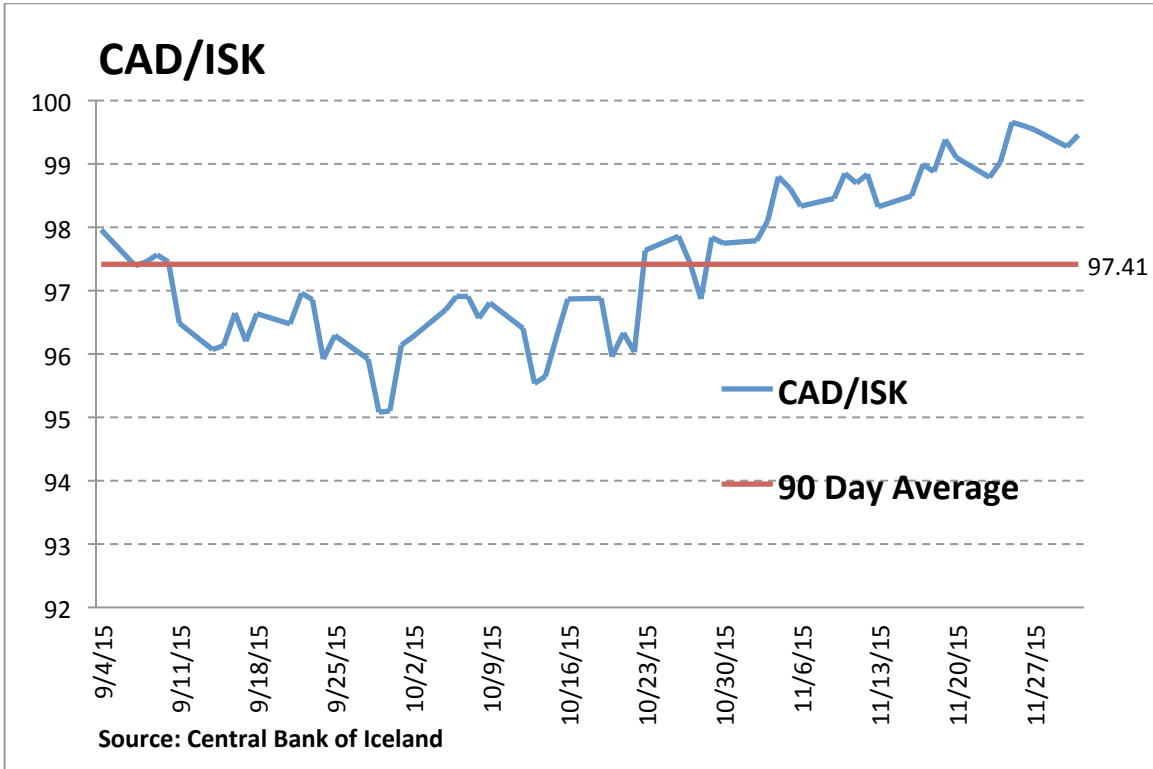


Chart 16

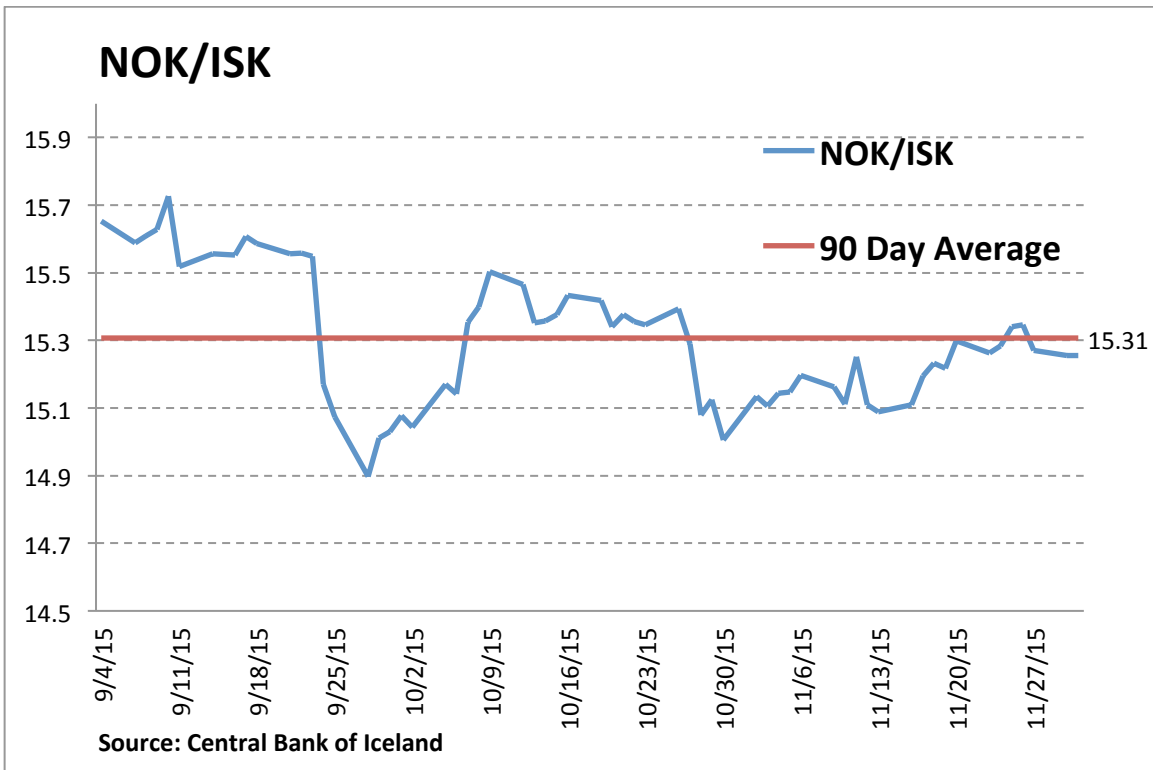
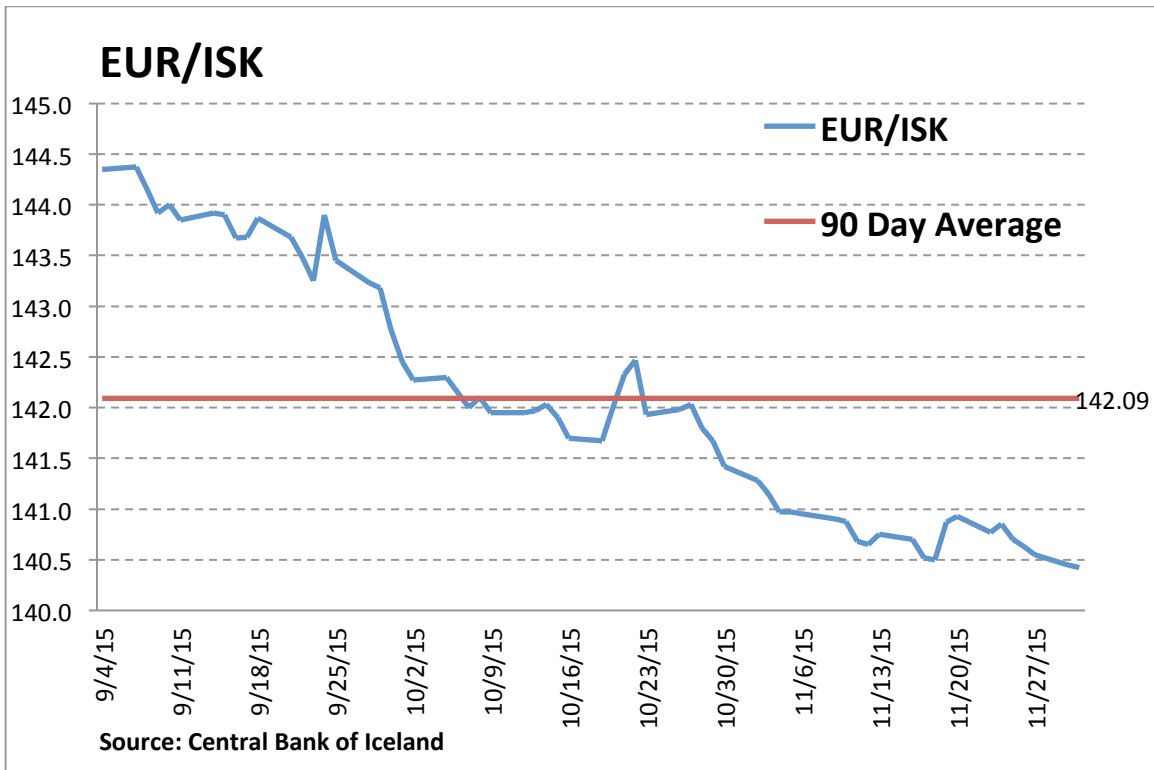


Chart 17



**Chart 18**

**Evaluation**

To properly evaluate the various currency board options explored above, there are two distinctions and tradeoffs that need to be made. The first concerns feasibility versus suitability. The second concerns the short run versus the long run. Indeed, Iceland could elect different structures for a currency board depending upon the country’s priorities. If Iceland chooses the most feasible currency board system of those outlined in this paper, it would likely anchor the kroná to the Canadian dollar or the Norwegian krone. These options are more feasible than the anchoring to the euro given the requirements that the ECB has outlined for euro adoption in the past and Icelanders’ stance on EU membership. At the same time, it is likely that prioritizing feasibility would sacrifice the overall long-term suitability and compatibility of the anchor currency. While Canada and Norway do experience similar shocks as Iceland, Europe is Iceland’s largest trading partner and thus the largest international economic presence on the island. The euro is also a more globally important currency than the CAD and the NOK. If Iceland decides to that it wants to institute a currency board system now, the euro option is not realistically available. The debt crisis and the after effects of prolonged tight monetary policy have created an undesirable economic climate at present. However, many are bullish on Europe in the long run. Considering that the euro is likely a better fit with the kroná, a euro reserve currency under an Icelandic currency board system could potentially prove to be the solution to Iceland’s long history of drastically unstable economic developments.

## Bibliography

Aliber, Robert Z., and Gylfi Zoega. 2011. *Preludes to the Icelandic Financial Crisis*. Basingstoke, United Kingdom: Palgrave Macmillan.

Bank of Canada. 2011. "Bank of Canada Releases Background Information on Renewal of the Inflation-Control Target." Bank of Canada Web site, November 9.  
<http://www.bankofcanada.ca/wp-content/uploads/2011/11/pr091111.pdf>

Bergmann, Eiríkur. 2014. *Iceland and the International Financial Crisis: Boom, Bust and Recovery*. Basingstoke, United Kingdom: Palgrave Macmillan.

Beckerman, Paul. 2001. "Dollarization and Semi-Dollarization in Ecuador." World Bank Policy Research Paper 2643.  
<https://openknowledge.worldbank.org/bitstream/handle/10986/19595/multi0page.pdf?sequence=1>

Brogger, Tasneem, and Helga Kristin Einarsdottir. 2008. "Iceland May Ask for IMF Loan as Well as Borrowing From Russia." Bloomberg, October 8.  
<http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aWPGlcNUQ5CQ>

Canadian Manufacturing. 2011. "Aluminum Heavyweights to Make \$15-billion Quebec Investment." The Canadian Press, October 4.  
<https://web.archive.org/web/20111013193436/http://www.canadianmanufacturing.com/general/aluminum-heavyweights-to-make-15-billion-quebec-investment-43389>

Carey, David. 2009. "Iceland: The Financial and Economic Crisis." OECD Economics Department Working Papers, No. 725.  
<http://www.oecdilibrary.org/docserver/download/5ks8lmg54nf5.pdf?expires=1449873541&id=id&accname=guest&checksum=638B80F4973EC36D8736DA6EC8B54378>

Central Bank of Iceland. 2001a. "The Icelandic Foreign Exchange Market." *Central Bank of Iceland Monetary Bulletin*, August: 57-62.  
[http://www.cb.is/uploads/files/mb013\\_6.pdf](http://www.cb.is/uploads/files/mb013_6.pdf)

Central Bank of Iceland. 2001b. "The New Framework for Monetary Policy." *Central Bank of Iceland Monetary Bulletin*, May: 40-45.  
[http://www.sedlabanki.is/uploads/files/mb012\\_5.pdf](http://www.sedlabanki.is/uploads/files/mb012_5.pdf)

Central Bank of Iceland. 2015. *Central Bank of Iceland Web Site Statistics*.  
<http://www.cb.is/statistics/>

Christensen, Lars. N.d. "The Market Monetarist." Blog.  
<http://marketmonetarist.com/>

Christensen, Lars. 2015. "Iceland after Currency Controls - Lars Christensen." YouTube. [https://www.youtube.com/watch?v=ho\\_o4o4LAyU](https://www.youtube.com/watch?v=ho_o4o4LAyU)

*Economist*. 2011. "Changing Target - Should the Fed Target Nominal GDP." August 27. <http://www.economist.com/node/21526886>

Fisheries and Oceans Canada. 2011. "Canadian Fishing Industry Overview". Economic Analysis and Statistics - Department of Fisheries and Oceans. <https://web.archive.org/web/20130512061342/http://www.apcfn.ca/en/fisheries/re-sources/Aboriginal%20Fisheries%20in%20Canada%20-%20Overview%20-Canadian%20Market%20Trends%20-%20David%20Millette.pdf>

Federal Reserve Board of Governors. 2010. "Minutes of the Federal Open Market Committee," September 21. <http://www.federalreserve.gov/newsevents/press/monetary/fomcminutes20100921.pdf>

Gudmundsson, Mar. 2012. "Currency and Exchange Rate Regime Options." Central Bank of Iceland Web site. September 7. [http://www.cb.is/library/Skraarsafn---EN/EMU-skýrsla/Currency\\_and\\_exchange\\_rate\\_regime\\_options.pdf](http://www.cb.is/library/Skraarsafn---EN/EMU-skýrsla/Currency_and_exchange_rate_regime_options.pdf)

Gudmundsson, Mar. 2010. "Statement on Capital Controls." Central Bank of Iceland Web site. November 3. <http://www.cb.is/lisalib/getfile.aspx?itemid=8210>

Hanke, Steve H. 2002. "Currency Boards." *The Annals of the American Academy of Political and Social Science*, No. 579, January: 87-105 . <http://object.cato.org/sites/cato.org/files/articles/steve-hanke-annals.pdf>

Hanke, Steve H. 2008. "Friedman: Float or Fix?" *Cato Journal*, Volume 28(2), Spring/Summer 2008: 275-285. <http://object.cato.org/sites/cato.org/files/serials/files/cato-journal/2008/5/cj28n2-11.pdf>

Hanke, Steve H. 2015. "Europe's Anemic Growth: It's the Money Supply, Stupid." Cato Institute, Cato at Liberty blog, September 15. <http://www.cato.org/blog/europes-anemic-growth-its-money-supply-stupid-2>

Hanke, Steve H., and Kurt Schuler. [1994] 2015. *Currency Boards For Developing Countries: A Handbook*, revised edition (original edition San Francisco: ICS Press, 1994). [http://krieger.jhu.edu/iae/books/Currency\\_Boards\\_for\\_Developing\\_Countries.pdf](http://krieger.jhu.edu/iae/books/Currency_Boards_for_Developing_Countries.pdf)

Hoy, Peter. 2005. "What's The Fuss Over Inflation Targeting?" Bloomberg, November 6.  
<http://www.bloomberg.com/bw/stories/2005-11-06/whats-the-fuss-over-inflation-targeting>

Icelandic National Energy Agency. 2014. "Generation of Electricity in Iceland."  
<http://www.nea.is/the-national-energy-authority/energy-statistics/generation-of-electricity/>

*IceNews*. 2008. "Iceland Cannot Adopt Euro with Joining EU, Says Stark." February 23.  
<http://web.archive.org/web/20121029035008/http://www.icenews.is/index.php/2008/02/23/iceland-cannot-adopt-euro-with-joining-eu-says-stark/>

Icesave. 2008. "Savings Accounts." Archived from the Original on 2 February 2008.  
<http://web.archive.org/web/20080202162406/www.icesave.co.uk/savings-range.html>

IMF International Financial Statistics. 2015. *IMF data eLibrary*.  
<http://data.imf.org/?sk=5DABAFF2-C5AD-4D27-A175-1253419C02D1&sid=1390030341854>

International Monetary Fund. 2015. "Iceland and the IMF -- Article IV Staff Reports (2001-2015)." IMF Web site.  
<https://www.imf.org/external/country/isl/index.htm?type=56>

Jahan, Sarwat. 2012. "Inflation Targeting: Holding the Line." *Finance and Development*, March 2012.  
<http://www.imf.org/external/pubs/ft/fandd/basics/target.htm>

Lewis, Paul. 2006. "Foreign Banks Offer Best Buys." BBC News, November 30.  
<http://news.bbc.co.uk/2/hi/programmes/moneybox/6051276.stm>

Mason, Rowena. 2008. "Financial Crisis: Iceland Nationalises Bank and Seeks Russian Loan." *The Telegraph*, October 25.  
<http://www.telegraph.co.uk/finance/newsbysector/banksandfinance/3154116/Financial-crisis-Iceland-nationalises-bank-and-seeks-Russian-loan.html>

Oslo Bors. 2015. *Oslo Bors Web Site Quotes and Markets*.  
[http://www.oslobors.no/ob\\_eng/markedsaktivitet/-/list/nibor/quotelist](http://www.oslobors.no/ob_eng/markedsaktivitet/-/list/nibor/quotelist)

Sigurðardóttir, Heiðrún. 2012. "Iceland's Optimum Monetary Policy and the Economic History of Iceland." Unpublished master's thesis, Aarhus School of Business.  
<http://pure.au.dk/portal-asb-student/files/45236251/THESIS.pdf>

Spruk, Rok. 2010. "Iceland's Financial and Economic Crisis: Causes, Consequences and Implications." European Enterprise Institute Policy Paper No. 2010-1.  
[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1574296](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1574296)

Statistics Iceland. 2014. "Gross Domestic Product and Gross National Income at Constant Prices 1980-2014-Statistics Iceland." Statistics Iceland Web site.

[http://px.hagstofa.is/pxen/pxweb/en/Efnahagur/Efnahagur\\_thjodhagsreikningar\\_landsframl\\_1\\_1\\_landsframleidsla/THJ01103.px/table/tableViewLayout1/?rxid=636c251b-e49a-4c15-ab9f-6e6e3663621c](http://px.hagstofa.is/pxen/pxweb/en/Efnahagur/Efnahagur_thjodhagsreikningar_landsframl_1_1_landsframleidsla/THJ01103.px/table/tableViewLayout1/?rxid=636c251b-e49a-4c15-ab9f-6e6e3663621c)

Sumner, Scott B. 2014. "Nominal GDP Targeting: A Simple Rule to Improve Fed Performance." *Cato Journal*, Volume 34(2), Spring/Summer 2014: 315-337.

<http://object.cato.org/sites/cato.org/files/serials/files/cato-journal/2014/5/cato-journal-v34n2-7.pdf>

Sumner, Scott. "The Money Illusion." Blog.

<http://www.themoneyillusion.com/>

Sumner, Scott. 2015. *The Midas Paradox: Financial Markets, Government Policy Shocks, and the Great Depression*. Oakland: Independent Institute.

Thomas, Richard. 2006. "Icelandic Banks." Merrill Lynch, March 7.

<https://notendur.hi.is/ajonsson/kennsla2006/Merrill%20Lynch%20-%20Icelandic%20Banks.pdf>

Tinbergen, Jan. 1952. *On the Theory of Economic Policy*. Amsterdam: North-Holland, 1952.

<http://www.garfield.library.upenn.edu/classics1986/A1986C401200001.pdf>

Valgreen, Carsten, Lars Christensen, Peter Possing Andersen, and Rene Kallestrup. 2006. "Iceland: Geyser Crisis." Dankse Bank.

<http://www.mbl.is/media/98/398.pdf>

Warner, Jeremy. 2011. "Bank Comes Close to Admitting It's Targeting Nominal GDP Growth." Telegraph Blogs, *The Telegraph*, August 11.

<http://blogs.telegraph.co.uk/finance/jeremywarner/100011568/bank-comes-close-to-admitting-its-targeting-nominal-gdp-growth/>