Interwar Monetary Fragmentation and the Gold Standard Restored: The Crisis of 1929 Compared with the Crisis of 2008

Thomas Marmefelt

Associate Professor of Economics

University of Södertörn, Social Sciences, SE-141 89 Huddinge, Sweden

Phone: +46 8 608 41 15; E-mail: thomas.marmefelt@sh.se

Adjunct Professor (Docent) of Economics, especially Evolutionary Economics

Åbo Akademi University, Åbo/Turku, Finland

Paper prepared for the International Conference on Large-Scale Crises: 1929 vs. 2008,

Ancona, December 17-19, 2015

Preliminary version

Comments most welcome!

Interwar Monetary Fragmentation and the Gold Standard Restored: The Crisis of 1929 Compared with the Crisis of 2008

Thomas Marmefelt
University of Södertörn, Social Sciences, SE-141 89 Huddinge, Sweden
Phone: +46 8 608 41 15, Fax: +46 8 608 40 30, E-mail: thomas.marmefelt@sh.se
Åbo Akademi University, Åbo/Turku, Finland

Abstract
The current emergence of intangible money highlights the importance of a stable measure of value, taking into account that money is a social institution rather than a commodity. The classical gold standard used gold as measure of value, implying commodity money. In contrast, following the Wicksell-Mises-Schumpeter trajectory, money is regarded as a social institution rather than a commodity, thus involving a credit economy, such as settlement of bills of exchange, so that money is not tied to gold. This conjecture is compared with Keynes's stress on bank money. The gold standard, 1870-1914, had unified the monetary functions, medium of account and medium of exchange, into one single asset, and opened for financial integration due to exchange rate stability, involving bank clearing as a cashless payments system. The Genoa conference in 1922 opened for the gold-exchange standard by allowing central banks to hold convertible currencies as reserves, in addition to gold. The gold-exchange standard was an adaptation to the credit economy, as it opened for bills in convertible currencies, and thereby private money. Today, intangible money emerges, making use of information and communication technology and sometimes calls are made today for a return to the gold standard, especially in connection with the 2008 financial crisis, a new gold standard, to provide a stable measure of value. The gold-exchange standard failed to prevent the 1929 crisis, so here the focus would be on the weaknesses of that monetary regime. The 2008 crisis involved abundant credit money, so here the focus would be to see hypothetically what impact some new gold standard would have done to prevent the money and credit creation behind the 2008 crisis. As social institution, money has a cognitive dimension, which represents the way traders think about money as unit of account and medium of exchange, respectively, in the form of monetary heuristics, translating the unit of account to a particular worth. As social institution, money also has a behavioral dimension, which is expressed in the purchasing power of money; what commodity bundle could be bought for a certain amount of one currency, a medium of account with its associated media of exchange, for another currency, thus establishing exchange rates. This paper analyzes interwar monetary fragmentation and the attempt to restore the gold standard, thus establishing the gold-exchange standard, which fell as a consequence of the 1929 crisis, thus not being viable. It analyzes in the Baltic and North Seas region, monetary fragmentation due to the creation of new independent states and attempts to find price stability by returning to a commodity-based payments system, the gold-exchange standard, after a period with floating exchange rates and high inflation, in some cases hyperinflation. It considers the relative weight of foreign exchange as bills of exchange to gold in central bank reserves, and the international distribution of gold reserves, and the disintegration into three gold-exchange blocs. Lessons are drawn for the 2008 crisis and proposals to establish a new gold standard, considering the extent to which those proposals resemble the gold-exchange standard.

Keywords: long-distance trade, monetary arrangements, value of money, social learning, monetary history, monetary fragmentation, gold standard regimes, Baltic and North Seas region

1 INTRODUCTION

The current emergence of intangible money highlights the importance of a stable measure of value, taking into account that money is a social institution rather than a commodity. The classical gold standard used gold as measure of value, implying commodity money. In contrast, following the Wicksell-Mises-Schumpeter trajectory (Wicksell, [1906] 1966; Mises, [1912] 1924; Schumpeter, 1917-18, 1970) money is regarded as a social institution rather than a commodity, thus involving a credit economy, such as settlement of bills of exchange, so that money is not tied to gold. This conjecture, which stresses that credit money turned gold into a weak constraint, is compared with Keynes's (1930a,b) stress on bank money.

The gold standard, 1870-1914, had unified the monetary functions, medium of account and medium of exchange, into one single asset. It was a return to commodity money, in contrast to the abstract bank money used by the exchange banks that emerged in the seventeenth century. These banks had established a cashless payments system, by using bills of exchange. Denzel (2010) point out how a Northwestern European cashless payments system developed with Amsterdam as the financial center during the seventeenth and eighteenth centuries, but with London taking over in the nineteenth century as the world financial center.

The gold standard gave the first era of globalization. Rodrik (1997) even argues that the world economy was more integrated during the gold standard than during the present globalization era, trade volumes peaked before World War I and collapsed during the interwar years. This is important, since money has co-evolved with long-distance trade. According to Denzel (2010), the classical gold standard was based on convertibility of gold, exchange rate stability, and balance of payments adjustments, the latter two being automatic, so exchange rates fluctuated around the respective gold parity of the currencies at issue, but showed extensive stability. The gold standard opened for financial integration due to exchange rate

stability, involving bank clearing as a cashless payments system, but also demand-driven credit money responding to the real economy, along the lines of Schumpeter (1917-18), meaning that the stream of commodities induces the stream of money. Mises ([1912] 1924) stresses how credit liberates trade from the constraints of money material, while Wicksell ([1906] 1966) stresses how bills of exchange or mutual redemption of banknotes replace gold in international settlements.

2 A COMPLEXITY PERSPECTIVE ON THE INTERWAR RESTORATION OF THE GOLD STANDARD AND A NEW GOLD STANDARD TODAY

The interwar period experienced a restoration of the gold standard that had broken down with the start of World War I in 1914, but in a new variety. The Genoa conference in 1922 opened for the gold-exchange standard by allowing central banks to hold convertible currencies as reserves, in addition to gold. In the mid-1920s, this standard emerged and by 1927 gold convertibility with fixed parities were to a large extent restored, only two years prior to the 1929 crisis. The gold-exchange standard was an adaptation to the credit economy, as it opened for bills in convertible currencies, and thereby private money. Today, intangible money emerges, making use of information and communication technology.

Sometimes calls are made today for a return to the gold standard, especially in connection with the 2008 financial crisis, a new gold standard, to provide a stable measure of value, allowing for some parallel gold standard to evolve with some kind of private gold money, in particular by White (2011, 2012, 2015), who represents the fractional reserve free banking majority of the Austrian school, while Huerta de Soto (2006), who represents the 100 percent reserve free banking minority of the Austrian school, uses Austrian business cycle theory, which was developed by Mises (1912 [1924], 1928) and Hayek, (1929, 1931), to show that credit creates an artificial boom that leads to bust, already is committed to the gold standard.

This paper analyzes interwar monetary fragmentation and the attempt to restore the gold standard, thus establishing the gold-exchange standard, which fell as a consequence of the 1929 crisis, thus not being viable. It analyzes in the Baltic and North Seas region, monetary fragmentation due to the creation of new independent states and attempts to find price stability by returning to a commodity-based payments system, the gold-exchange standard, after a period with floating exchange rates and high inflation, in some cases hyperinflation. It considers the relative weight of foreign exchange as bills of exchange to gold in central bank reserves, and the international distribution of gold reserves, and the disintegration into three gold-exchange blocs. Lessons are drawn for the 2008 crisis and proposals to establish a new gold standard, considering the extent to which those proposals resemble the gold-exchange standard.

The 1929 and 2008 crises involve two different cases. The gold-exchange standard failed to prevent the 1929 crisis, so here the focus would be on the weaknesses of that monetary regime. The 2008 crisis did not have any gold standard, but abundant credit money, so here the focus would be to see hypothetically what impact some new gold standard would have done to prevent the money and credit creation behind the 2008 crisis. The *Amsterdamsche Wisselbank* had used a special bank money distinct from current money, to handle its settlements of bills of exchange, the latter being a private money. However, Amsterdam was replaced by London as the world's financial center, leading eventually to the gold standard, first being established in Great Britain and later adopted internationally (see Denzel, 2010). In the interwar period the gold standard, which had involved globalization, was restored as the gold-exchange standard, which after the crisis of 1929 disintegrated into three monetary blocs: exchange control bloc, sterling bloc, and gold bloc (see Eichengreen, 1996; Feinstein et al., 1997).

Analyzing this latter historical transition sheds light on current proposals, as the one by White (2012), following the 2008 financial crisis, to find a stable monetary system, including some new gold standard. In this context, this involves the issue of fractional reserves versus 100 percent reserves, here from the perspective of the Austrian school, here illustrated by White (2011, 2012, 2015) versus Huerta de Soto (2006), respectively.

The functioning of money as a social institution, involves some monetary heuristics that evolve over time. These are what Gigerenzer (2008) calls fast and frugal heuristics, defined as a strategy that searches for minimal information and consists of building blocks that exploit evolved capacities and environmental structures, and social heuristics that exploit the capacity of humans for social learning and imitation. Learning involves the formation of a mental model of a phenomenon.

The notion of mental model goes back to Hayek (1952), who considers a map, which reproduces relations in the physical world, around us. Schank and Abelson (1977) use the notion of a script, which links events to subsequent outcomes, in which common knowledge of the script implies that everyone knows the meaning the actions of other agents and how to respond. Turning to complex adaptive systems, Gell-Mann (1994) calls it a schema, which represents perceived regularities, being some combination of description, prediction, and prescriptions for action, while Holland (2006) uses the notion of classifier systems to define a classifier system agent, composed of lists of classifiers and signals and sets of detectors, effectors (filling needs), and reservoirs (the agent's needs). Hence, the mental model is called map, script, schema, or classifier system.

Morin (2007) uses restricted complexity for complex adaptive systems, in contrast to general complexity, in which organization of the parts into a whole is emergent, giving rise to complex relations between the parts and the whole, involving self-eco-organization, environment-dependent self-organization. It shapes the way we consider the formation of

heuristics, which evolve continually. In terms of restricted complexity, Hommes's (2013) notion of behavioral rationality stresses heuristics as simple, intuitive decision rules, involving switching between strategies through reinforcement learning and learning within each class of heuristics changing parameters through adaptive learning, while heterogeneous, behaviorally rational agents give an economy with highly nonlinear complex evolving systems. Turning to general complexity, Human and Cillers (2013) see the economy as dependent upon the limits and constraints determined by the relationships between parts of the system and apply to their notion of economy the notion of general complexity, into what they call a general economy, which is open to change and to chance. Hence, money is a complex system, involving different components, such as an international monetary regime and domestic monetary regimes, which interact. Consequently, monetary heuristics play a crucial role to the evolution of money as complex system.

Monetary heuristics evolve continually, having their origin in the evolution of humans in economic environments, in which they conduct exchange. The environment at issue is the market, and exchanges shape the market that shapes the exchanges. There is a mental model called map, script, schema, or classifier system. Hayek's (1952) map is an apparatus of classification, by which a sequence of individual mental images results from streams of impulses. According to this mental map, individuals observe, reflect, and respond, learning from observation and association through a cognitive process based upon social interaction. Specifically, the monetary heuristics are seen in the relative purchasing power of currencies, under the gold standard expressed in terms of gold. This argument has its foundation in the Wicksell-Mises-Schumpeter conjecture, according to which the value of money is its purchasing power (Wicksell, [1906] 1966; Mises, [1912] 1924; Schumpeter, 1917-18, 1970), a conjecture rejecting commodity money. Following this conjecture, monetary heuristics are based on

perceived purchasing power, and exchange rates are the outcomes of relative perceived purchasing power of currencies.

Financial evolution means that monetary arrangements obtain a higher level of complexity, including more sophisticated monetary heuristics. Money is a social institution and as such it has both a cognitive as well as a behavioral dimension, along the lines of Aoki (2011), so in the cognitive dimension behavioral beliefs are inferred from a public representation of the state of play, while in behavioral dimension strategic choices motivated by behavioral beliefs generates a state of play. In societal evolution, there is an increasing complexity of the knowledge structure, while symbols allow the transfer of complex images from one mind to another (Boulding, 1978).

Focusing on the cognitive aspect of money as social institution, the evolution of units of account and media of exchange are studied as adaptive responses by human minds. As social institution, money has a cognitive dimension, which represents the way traders think about money as unit of account and medium of exchange, respectively, in the form of monetary heuristics, translating the unit of account to a particular worth, using a social script to which market agents attribute a specific worth. When the value of the underlying commodity bundle changes from the original worth, market agents observe a script deviation of that bundle, attributing that to changes in the commodity space, and adjust the bundle accordingly. The commodity bundle is what can be purchased by a monetary unit, under a gold standard what the commodity bundle that any economic agent can purchase for a specific quantity of gold.

As social institution, money also has a behavioral dimension, which is expressed in the purchasing power of money; what commodity bundle could be bought for a unit of a currency, a medium of account with its associated media of exchange, for another currency, thus establishing exchange rates. Exchange rates between currencies were established according to relative perceived purchasing power, some kind of classifier system. Along the

cognitive dimension, long-distance traders formed beliefs about the relative purchasing power of their currency compared with the foreign one; along the behavioral one they exchanged money at the rates so specified.

Focusing on the cognitive aspect of money as social institution, the evolution of units of account and media of exchange, with the gold standard united into a single asset we call money, are studied as adaptive responses by human minds. The emphasis will be on the heuristics of long-distance traders in the Baltic and North Seas region, considering the exchange of commodities and of monies. Going beyond the emergence of money as medium of exchange, this paper studies the emergence of units of account and of media of exchange, that is, the emergence of monetary arrangements as co-evolution of units of account and media of exchange, having turned perfectly correlated, when the gold standard previously had united these functions into the single asset money, whose purchasing power was based on gold, and the desire to restore it; the interwar restoration as gold-exchange standard, and some hypothetical restoration today.

3. THE CREDIT ECONOMY AND THE GOLD-EXCHANGE STANDARD

While Wicksell-Mises-Schumpeter conjecture reflects the credit economy under the gold standard, Keynes (1930a,b) reflects the gold exchange under the interwar gold-exchange standard. Wicksell's pure credit economy is associated with settlement of international payments through bills of exchange. Wicksell, Mises, and Schumpeter argue for a credit economy, opposing the gold standard, while Keynes elaborates, bringing in the gold-exchange standard.

Wicksell ([1906] 1966) considers credit as a remedy to scarcity of money, being the foremost lever to increase velocity of money, so a small money supply may intermediate a large quantity of capital formation, while bills of exchange increase virtual velocity. He

argues that bank lending prevents cash balances from remaining idle and that payments are made through giro transfer from the balance sheet of one customer to the balance sheet of another one, which implies an accounting system of exchange. During the gold standard, Wicksell in fact argues that international payments can be settled without gold through bills of exchange or mutual redemption of banknotes of other banks. Developing his pure credit economy, he argues that credit can easily replace gold, that gold in minted form is unnecessary and harmful, and that there is a demand for settlement of bills of exchange.

Mises ([1912] 1924) sees credit money, which emerged through giro banks as a resolution to the misuse of coins as commodity money, arguing that the modern organization of settlements and the institution of credit have liberated trade from the constraints made by the volume and weight of the money material. Schumpeter (1917-18) argues that the stream of commodities induces the stream of money, so that bank money is demand-driven, and that credit and money creation is a capitalistic means of progress. To Schumpeter (1970), the money method is a method of social settlement of accounts and extension of credit balances liberates the economic process from its money constraints, thus moving the economy in the direction of a pure settlement of accounts system.

During the gold-exchange standard, Keynes (1930a) states that the demand for money is actually a demand for purchasing power, and brings in the price-level, as the price of a composite commodity to determine how many units of money is required per unit of purchasing power. He presents index-numbers of prices as the definite measure of purchasing power, in which consumptions goods are weighted in proportion to money income spent on them, referring to the money of account as a historical measure. He makes a distinction between the wholesale standard and the international standard, and observes how the international price levels fall relatively to the index of local purchasing power. The British return to the gold standard at pre-war (World War I) parity, Keynes attributes to the habit of

regarding the wholesale standard as a satisfactory indicator of general purchasing power, and he stresses that comparison of purchasing power as amounts of money income between individuals of equal real incomes.

Furthermore, Keynes adds bank money explicitly. He defines total deposits as the sum of income-deposits, business-deposits, and savings-deposits, and the banking system cause the the price-level to rise (fall), as it lets the rate of investment exceed (fall behind) the rate of saving. In price-level equilibrium, according to Keynes, the banking system regulates lending so that the market rate of interest equals the natural rate of interest, causing the value of investment to be equal to saving, total profits to be zero, and resources are moves between the production of consumption goods to capital goods until the purchasing power of money is in equilibrium. However, he also points out that the central bank, under an international currency system, such as gold, must focus on the external equilibrium, so that the foreign balance is equal to the foreign lending, and let the domestic economy adapt, as a standard other than the purchasing power of money itself must be preserved.

Keynes makes an important distinction between industrial and financial circulation, deposits used for industry and finance, respectively, industry using incomes-deposits and business-deposits A, while finance uses savings-deposits and business-deposits B, the latter being small, so cash-deposits equal to incomes-deposits plus business-deposits account for industrial circulation index, while savings-deposits accounts for financial circulation changes. The industrial circulation means, according to Keynes, that incomes flow into business-speosits through the purchase of goods and out again through the payment of wages, while the financial circulation is dominated by the turnover of securities, to which fixed capital is small in a modern stock-exchange-equipped economy.

For the Unites States in 1929, Keynes observed an enormous rise in the price of securities, not being accompanied by any rise in the price of the current output of new fixed

capital, which he interprets as an outcome of "bull" investors buying securities and borrowing money via the banking system from "bear" investors due to a difference of opinion concerning the prospects of securities, thus increasing savings-deposits of the latter relative to those wealth-holders who permanently prefer savings-deposits to securities. In general, Keynes sees changes in savings-deposits as an indicator of changes in the "bear" position, but he distinguishes between four types:

(i) *A "bull" market with consensus of opinion*: prices of securities rise insufficiently, so M3 falls, and "bear" investors close their positions on a rising market;

(ii) *A "bull" market with division of opinion*: prices of securities rise more than sufficiently, so M3 increases, and "bear" investors increase their position on a rising market;

(iii) *A "bear" market with division of opinion*: prices of securities fall more than sufficiently, so M3 falls, and "bear" investors close their position on a falling market; and

(iv) *A "bear" market with consensus of opinion*: prices of securities fall insufficiently, so M3 rises, and "bear" investors increase their position on a falling market.

An increase in savings-deposits, not accompanied by a corresponding increase in the total assets of banks, have according to Keynes, the effect on industry as an increase in money supply in cases (i) and (iii), and a decrease in money supply in cases (ii) and (iv). The reason is that a greater share of the total money supply becomes available for industry as "bear" investors close their positions of savings-deposits. However, the consensus of opinion concerning the prospects of securities matter to the purchasing power of money. Keynes points out that when the prices of securities are rising, it is likely that the prices of new investment does also increase, so the purchasing power of money reduces in case (i), but rises in case (iv), while opposing effects in the attractiveness of investments and the supply of

money operate in cases (ii) and (iii). The reason is that "bear" investors change their position with the market, so that the prices of securities and the purchasing power of money move in opposite directions. The theorizing of Keynes is in line with the Wicksell-Mises-Schumpeter conjecture, but it reflects financial evolution and a higher degree of complexity with bank-money and stock markets.

4. INTERWAR MONETARY FRAGMENTATION

The restoration of the gold standard, as gold-exchange standard influenced the functioning of money as complex system, as it added to complexity. The gold standard had given exchange rate stability, thus implying stable relative purchasing power among economies having adopted the standard. The reason for this stability was convertibility, but the stability was not perfect. Denzel (2010) argues that the classical gold standard was based on convertibility of gold, exchange rate stability, and balance of payments adjustments, the latter two being automatic, so while exchange rates fluctuated around the gold parities of the currencies at issue, they showed extensive stability. In contrast, Einzig (1962 [1970]) argues that there were wide exchange movements and complications due to the co-existence of silver and gold; and except Great Britain, the United States, and the Netherlands, monetary authorities tried to control outflow of gold, while sterling bills were used to finance operations worldwide, since the British gold reserve was very small.

For the Baltic and North Seas region, the German unification and the German adoption of the Gold standard had been decisive. The German unification led Germany to adopt the gold standard in 1871 and the demonetization of silver in 1873 (Shaw, 1895). There had been a bifurcation in history between the British gold standard and the French gold *franc* with the Latin Monetary Union (1866-1924) as a means to create an international gold *franc* currency,

while the German adoption of the gold standard in 1871 paved the way for the formation of the Scandinavian Currency Union (1873-1924).

Redish (2000) finds that Great Britain abandoned a bimetallic standard for a gold standard by legislation in 1816, which suspended free coinage of silver and turned silver coins into convertible token coins, while the Latin Monetary Union, formed in 1865 by Belgium, France, Italy, and Switzerland (Greece joined in 1868), eventually adopted a limping gold standard in 1878 by suspending coinage of 5 *franc* silver coins, but still remaining full legal tender. Both Flandreau (2000) and Einuadi (2000) consider the Latin Monetary Union, a coinage agreement, primarily as an attempt to establish a *franc*-based international currency, Flandreau pointing out that it failed with the French defeat in the Franco-Prussian War 1870-71, actually organizing the circulation of petty silver coinage within the union. While Einaudi (2000) attributes the creation of the Scandinavian Currency Union to the fact that neither the *franc* nor the German *mark* would be an international currency, Lobell (2010) argues that the creation of a universal international monetary system based on the French gold *franc* was shelved after the Franco-Prussian War, and the German adoption of the gold standard was followed by Sweden and Denmark in 1873, creating a common monetary system, joined by Norway in 1875, establishing the Scandinavian *krona* (Sweden) or *krone* (Denmark and Norway) as unit of account. Øksendal (2007) argues that the Scandinavian Currency Union's major contribution was financial integration among the three countries.

Germany, the three Scandinavian countries, the Netherlands, and Finland (at the time a grand principality in the Russian Empire) adopted the gold standard in the 1870s, while Russia did not do so until 1897. Drummond (1976) points out that Count Witte imposed the gold standard on Russia in 1897 and that bank money expanded rapidly after the adaptation of the gold standard, so that the annual growth rate during the 1893-1914 period was 3.1 percent for the circulation of gold and currency, but 7 percent for the total money supply. Crisp

(1953) notes that the stabilization of the rouble in 1894 led to capital inflow, while Witte's monetary reform in 1897-99 established the gold standard and devalued the currency, thus restoring the parity between the paper and the gold rouble.

World War I put an end to the classical gold standard, and new independent states, such as Poland, Estonia, Latvia, and Lithuania were created. Bohlin (2010) points out that Sweden ended convertibility and imposed a ban on the export of gold in 1914, Denmark and Norway followed in 1916, but after the war the floating currencies had to be stabilized, as inflation was a major problem, Sweden and Great Britain, having experienced inflation followed by a sharp deflation in 1921-23, went back to a gold standard at the old parities in 1924 and 1925, respectively. High inflation had been the case in some countries, including hyperinflation, and Germany and Poland created new currencies based on gold in 1924, while France stabilized its currency in 1926 and went back to the gold standard in 1928 at one-fifth of its prewar gold parity (Eichengreen, 1996), while Norway and Denmark did not restore their old gold parities until 1927 (Klovland, 1998). The different pace of the Scandinavian countries meant a break-up of the Scandinavian Currency Union in 1924.

This union had before World War I contributed to a high degree of financial integration, based upon the gold standard, as Øksendal (2007) argues. However, Klovland (1998) points out that the three Scandinavian economies were less synchronized during the interwar years, Sweden restored gold standard at prewar parity in 1924, being only three percent from the parity already in 1922, while Denmark and Norway faced continued depreciation, by 1924. According to Klovland, Norway was at 50 percent of its prewar parity and Denmark was at 60 percent in 1924, before a tight monetary policy eventually brought Denmark and Norway back to the prewar parity in 1927 and 1928, respectively, giving them a gold-parity depression, similar to the British one after its restoration of the prewar parity in 1925. The difference between Sweden, on the one hand, and Denmark and Norway, on the other hand,

Klovland attributes to the tighter monetary policy in Sweden already in 1920. In contrast, he sees how the three Scandinavian countries left the gold standard in 1931 together with Great Britain, their largest trading partner.

However, in the Swedish policy debate, economists raised objections, while politicians were committed to restoring the gold standard at prewar parity. According to Wetterberg (2009), Knut Wicksell argued against the gold standard in favor of a free standard, a paper standard having banknotes without a metallic standard, while Gustav Cassel argued against harmful parities that manipulated exchange rates, but there was wide support in the Swedish Parliament for a restoration of the gold standard at prewar parity in 1920 and it decided accordingly in 1921. Wicksell's proposal resembles Meulen's (1934) banknote pound as invariable unit of value, which was to be created by substituting banknotes for gold coins and then letting the price of gold in banknote pounds fluctuate according to market conditions for gold. This represents an abstract unit of account.

Wetterberg points out that a harsh deflationary policy was introduced in 1920 when the *krona* was at ⅔ of its prewar parity, *Sveriges Riksbank* increased the discount rate to 7½ percent, and money supply decreased by 30 percent and the price-level by 35 percent in two years, the GDP dropped by five percent in 1921 and the deflation was so strong that the *krona* was undervalued even at prewar gold parity.

In the interwar years, there was a shortage of gold, and the gold reserves were unevenly distributed. According to Eichengreen (1987), the Genoa conference in 1922 was the birth of the gold-exchange standard, but it was not the origin of the central bank practice of holding foreign currency reserves, rather it institutionalized and encouraged the practice, an international monetary convention that in addition to gold as reserve, central banks were entitled to hold foreign balances, bills, short-term securities, and other liquid resources, which

required fixed exchange rates and allowed foreign reserves to be used, like gold, for international settlements.

As global gold reserves did not grow as fast output, the Genoa Conference in 1922 decided that central banks would be allowed to hold convertible currencies as well as gold as reserves, but in addition available gold reserves were unevenly distributed, the United States possessing almost half of the reserves, while France accumulated gold in Europe (Bohlin, 2008). This is an example of shortage of money metal, an experience going far back in monetary history. The bills of exchange emerged to overcome the shortage of monetary metal and thereby coins, foreign exchange business developed in Bruges in the Middle Ages, later replaced by Antwerp (Roover, 1948, Einzig, 1962 [1970]).

The bill of exchange had emerged as a cashless means of payment of European merchants in the Middle Ages, in Northwestern Europe and the Baltic Sea region, merchants gradually adopted it from the late sixteenth century, and it became a negotiable paper at the Antwerp stock exchange, followed by the establishment of a Northwestern European dominated cashless payment system with Amsterdam as financial center, which existed in the seventeenth and eighteenth centuries (Denzel, 2010). In contrast to gold as commodity money, seventeenth century exchange banks established an accounting system of exchange. *Amsterdamsche Wisselbank*, set up in 1609, used bills of exchange to operate a global accounting system of exchange for the Dutch East India Company, *Verenigde Oost Indische Companie* (Gillard, 2004). The bank used a money of account, *guilder banco*, which was an abstract unit of account. The *guilder banco* existed only as balances in the accounts of the bank, while the introduction of the negotiable receipt of deposit turned it into a fiat money (Quinn and Roberds, 2014). During the 1624-1776 period, Sweden had a complicated trimetallic standard, including copper due to shortage of silver and gold coins, and copper coinage led to the establishment of *Stockholms Banco* in 1656, later reorganized as *Sveriges*

Riksbank (under a different name), the Swedish central bank in 1668, and copper plate coins induced *Stockholms Banco* to issue banknotes in 1661, which it did excessively (see Wetterberg, 2009; Edvinsson 2010, 2012).

Hence, the gold-exchange standard could be considered more complex, but also more comprehensive than the classical gold standard, in explicitly recognizing private money, such as bills of exchange, as a part of total money, thus making gold supply a loose constraint. Eichengreen (1987) argues that the gold-exchange standard was a hybrid system, neither a pre-World War I pure gold standard nor a post-Bretton Woods fiat money system; countries were required to maintain gold convertibility of their currencies and free international gold flows, but they were allowed to hold reserves in foreign exchange, so when inconvertibility occurred in 1931, foreign reserves were liquidated and money supply was constrained. In effect, the gold constraint went from being loose to being tight.

The remarkable stability of the Amsterdam *guilder banco* provides a useful case of comparison. Huerta de Soto (2006), who argues for 100 percent reserves, free banking, and a gold standard, points at the *Amsterdamsche Wisselbank* as a 100 percent reserves bank, which nevertheless started violating its legal principles in the 1780s, while he argues that *Stockholms Banco,* violated 100 percent reserves by issuing banknotes beyond actual deposits received in cash. Following Austrian business cycle theory (Mises (1912 [1924], 1928); Hayek, 1929, 1931), he considers credit expansion as the origin of an artificial boom that leads to bust, because credit finances investment beyond saving, thus giving a production structure that does not reflect the intertemporal preferences of consumers. Credit may finance innovative investments, but his argument highlights the problem of excessive credit expansion. This also brings in foreign lending and foreign balance with movements of gold being the difference and total investment as the sum of home and foreign investment, along the lines of (Keynes, 1930a), and the efficiency of the gold-exchange standard as an international monetary regime,

involving Wicksell's (1906 [1966]) pure credit economy, in which international settlements are done through bills of exchange.

In the interwar years, the United States was the major lender and Germany and Eastern European countries were the main borrowers (Feinstein et al., 1997). This illustrates the monetary heuristics of the interwar years, having gold as the measure of value and source of stability. In 1924, the Dawes Plan, which aimed at giving Germany economic stability following the German hyperinflation, considered stable exchange rates as the key to economic stability, involving the restoration of the German prewar parity (Eichengreen and Temin, 2000). Gold had a solid position in the map of economic and political agents, so Germany created a new currency on a gold standard replacing the old one hit by hyperinflation.

There was a shortage of gold, but according to Eichengreen (1987) nothing really new, and the gold cover of central bank short-term liabilities the same in 1928 as in 1913, so maldistribution was the problem: France and the United States possessed almost 63 percent of the central monetary gold in the world in 1932, the share the French gold reserves having increased from 13 to 28 percent between the ends of 1928 and 1932.

This maldistribution can explain the break-up of the gold-exchange standard into three blocs: exchange control bloc, sterling bloc, and gold bloc. As Germany and Hungary installed exchange controls in response to the crisis of the Austrian bank *Credit Anstalt* in 1931, while Great Britain suspended gold convertibility and devalued by roughly 30 percent against gold currencies, the international monetary system disintegrated into three blocs: the exchange control bloc around Germany; the sterling bloc around Great Britain; and the gold bloc around the United States and France (Bohlin, 2010).

The Baltic and North Seas region was divided between these three blocs, where the Nordic countries all joined the sterling bloc together with Estonia, the Baltic country with the strongest affinity to the Nordic countries. The three Baltic countries, which enjoyed

independence during the interwar years, all joined separate blocs. Referring to Eichengreen (1987), we may observe for the following bloc distribution for economies of the Baltic and North Seas region, excluding the USSR, as a planned socialist economy:

(i) Exchange control bloc: Germany and Latvia;

(ii) Sterling bloc: United Kingdom (Great Britain and Irish Free State), Sweden, Denmark, Norway, Finland, and Estonia;

(iii) Gold bloc: France, Belgium, Switzerland, the Netherlands, Poland, Danzig, and Lithuania.

Considering exchange rates as perceived relative purchasing power of two currencies, shows the stability of gold as monetary heuristic. Figure 1 shows the Swedish exchange rates on Great Britain, Norway, and Denmark of the sterling bloc, Germany of the exchange control bloc, and the Netherlands of the gold bloc. The break-up of the Scandinavian Currency Union in 1924 becomes obvious, considering the appreciation of the Swedish *krona* to the Danish and Norwegian *krone*, and of course to the German old *mark* due to hyperinflation in Germany, while the new German currency, *reichsmark* restored the German prewar parity.

[Figure 1 about here]

We can observe stability during the gold-exchange standard, but divergence after it was abandoned. Considering the large Dutch gold reserve, the appreciation of the Dutch guilder after 1931 suggests that gold remained the dominant monetary heuristic. The German exchange control seems to have brought appreciation by preventing gold outflow. Figure 2 shows that the Swedish exchange rate index on Great Britain, Denmark, Norway, and Germany appreciated from 1913 to 1924, which marked a turning point, being the year Sweden restored the gold standard at prewar parity, while on the Netherlands it fluctuated. After the break-up of the gold-exchange standard in 1931, the divergence is clear, and it

appreciated Denmark and Norway, but depreciated to Great Britain, Germany, and the Netherlands.

[Figure 2 about here]

In addition to the almost 63 percent of the central monetary gold of the world of the United States and France that Eichengreen (1987) observes, his data gives a share of about 6½ percent both for the gold bloc countries Belgium and the Netherlands together, and for the sterling bloc countries: United Kingdom, Sweden, Denmark, Norway, Finland, Estonia, and Portugal together, while the exchange bloc country Germany had less than 2 percent. Eichengreen sees a combination of international and domestic policy effects behind the Great Depression, in which the American and French gold accumulation imposed constraints on other economies. This is essentially in line with systems analysis, where money is seen as complex system, involving interaction with the international monetary regime and domestic monetary regimes, as components.

The Swedish case involved dwindling foreign reserves, which consisted of dubious dollar bills of exchange in various Kreuger enterprises, and the fixed exchange rate was abandoned as the Swedish monetary policy gave priority to keeping the purchasing power of the *krona* stable, at first appreciating and then depreciating to the sterling, temporarily pegged again to sterling at the old parity at 18.16, before the Krueger crash in 1932 caused depreciation, but in 1933 it was pegged to sterling at 19.40 for the rest of the interwar period (see Jonung, 1979; Berg and Jonung, 1999; Bohlin, 2010), but the peg was changed in 1939, just a couple of days before the start of World War II, from the pound to the US dollar at the rate 4.20 (Wetterberg, 2009). Ivar Kreuger gave loans to governments in exchange for match monopolies, and borrowed extensively on international financial markets, using his innovation participating debentures to attract investors, a business that ended with the Wall Street crash, the financial crisis, and the collapse of the gold standard, and *Riksbank* credit was given to Kreuger almost

two percent of Sweden's GDP in 1931 (Wetterberg, 2009). The decision to follow Great Britain and leave the gold standard in 1931 and to peg the domestic currency in 1933 at a lower exchange rate for the rest of the interwar period was a common feature of the three Scandinavian countries and helped to overcome the Great Depression (Klovland, 1998). This reflects a slightly lower perceived purchasing power among the Scandinavian countries. One would expect to see injection of liquidity in these economies, but it seems modest. Figure 3 shows that the liquidity of the Swedish economy, the ratio of M3 to GDP, increased from 1920 to 1933 with peaks in 1922 and 1933, suggesting that the gold-exchange standard imposed some constraint, but still bank money is the largest share of money by far throughout the interwar period, the higher liquidity in the 1930s suggests that the Scandinavian countries actually did benefit from depreciation to other currencies in the region.

[Figure 3 about here]

Summing-up, the interwar monetary fragmentation and the gold-exchange standard increased the complexity of money and led to unstable dynamics, involving the international monetary regime and domestic monetary regimes, thus turning the 1929 crisis into a depression, and leaving the gold standard, following Great Britain, seems to have been beneficial to the Scandinavian countries in the 1930s rather than restoring it in the 1920s. Nevertheless, the gold-exchange standard brought stability for some years, but was not resilient to the 1929 crisis, which it failed to prevent.

5. A NEW GOLD STANDARD AND THE 2008 FINANCIAL CRISIS

The 2008 financial crisis brings up the issue of the gold standard again. During the classical gold standard, there was a strong globalization, like in recent decades. Globalization involves a strong financial integration, which makes the economies vulnerable to financial busts in other economies. The gold-exchange standard had failed to prevent the 1929 crisis, but the

2008 crisis involved abundant credit money, so the issue is what impact some new gold standard hypothetically would have done to prevent the money and credit creation behind the 2008 crisis. Kates (2010) argues that we ought to focus on the structure of demand rather than the aggregate level, and that structural problems explains the 2008 crisis: the meltdown in the American housing sector after financial institutions had been encouraged to lend to unsound borrowers, the bundling of mortgages into financial derivatives, massive American budget deficits, and arbitrary and erratic monetary policy, while Great Britain recovered from the Great Depression in 1933 by balancing the budget. These structural problems could been seen as incentive divergence among economic agents.

Gunning (2010) interprets the financial crisis in terms of incentive divergence, which exists by nature in a market economy due to interpersonal relations in a market and which gives rise to housing bubbles, involving novice speculators and cunning salespeople causing speculative demand for housing, while the Fed caused substantial increases in money in 2001 and 2003. Furthermore, Gunning argues there are reliance cycles in financial intermediation: reliance of savers on sellers of mortgage-backed securities and on ratings firms, of stockholders on corporate executives and ratings firms, and of large firms on insurers and hedge fund managers, but a large set of incentive divergence in financial intermediation, he attributes to government intervention: manipulation of money and credit, regulated fractional reserve banking, and deposit insurance.

Horwitz (2010) focuses on the latter, bringing in Austrian macroeconomics, and stresses the Fed's expansionary monetary policy, policies to artificially lower the costs and risks of home ownership, thus enabling high risk loans, essentially a failure of central banking and government intervention. This brings in Austrian business cycle theory, according to which credit creation creates an artificial boom that leads to bust. As Horwitz points out, it is a theory of malinvestment rather than overinvestment, or using Kates's words of structure

rather than level, by distorting the production structure. The discussion on structure of demand, incentive divergence cycles, and the production structure illustrate conceptually the economy as a complex system, in which structure is what matters.

The Austrian business cycle theory (Mises 1912 [1924], 1928; Hayek, 1929, 1931; Huerta de Soto, 2006) predicts both the 1929 crisis and the 2008 crisis, in terms of credit expansion. Huerta de Soto (2008) makes a strong case for a regime with 100 percent reserves, free banking, and a gold standard, thus making money identical to gold. However, White (2011, 2012, 2015), who represents the fractional free banking majority of the Austrian school, argues for restoring commodity money and in particular the gold standard. Both White and Huerta de Soto are committed to a gold standard with free banking, the only difference is 100 percent versus fractional reserves.

White (2011) claims that a gold standard with free banking would have avoided the boom-bust cycle, pointing at the injection of too much credit by the Fed in 2001-2006, and he stresses the importance of a commodity standard with free banking, as a gold standard with a discretionary central bank would be open to cheapening of credit when expedient, while a gold standard with a rule-based central bank would allow international gold flows adjusting the domestic price level to the world price level, but if it perceives a legitimate business demand for credit, it could create a boom-bust cycle by cheapening credit temporarily. Instead he argues for a gold standard with free banking, where interbank competition constrains credit creation, so that an increase in demand for credit will increase the market interest rate, since banks face a liquidity risk of running out of reserves and a need to maintain a reputation for creditworthiness.

White (2012) considers what would be the least costly way to make a transition to a gold standard, where pure cold defines the unit of account, comparing two ways: (i) let a parallel standard grow along the current fiat currency, and (ii) set a date when the current fiat currency

is defined by weight of pure gold; the first approach would require high inflation of the fiat currency to induce a transition to the gold currency, while the latter is a matter of finding the right parity. He points out the necessity of finding a parity close to the current market price of gold, referring to the deflation that followed the British restored gold standard at prewar parity in 1925. As we have seen, Sweden had created deflation to make the currency appreciate up to the prewar parity before adopting it, and we see a similar pattern for Denmark and Norway. White's proposal resembles the gold-exchange standard, but he tries to find an appropriate parity, essentially trying to avoid deflation (or inflation) by setting a parity at the current market price of gold. This has a parallel in the way national currencies of the EMU (Eurozone) countries obtained a parity to the euro. White does not find 100 reserves feasible, since he points out that extant gold reserves are too small to have 100 percent reserves for M1. It is still important to have adequate reserves though.

White (2015) expresses the market purchasing power of the gold unit of account as the product of the market purchasing power of the gold ounce and the specified gold content of the unit of account, which is fixed by legislation, relying on the Humean price-specie-flow mechanism to keep the national purchasing power of gold close to the world level, giving lower price-level uncertainty and a global currency facilitating trade. He argues again that it is only a matter of choosing a parity close to the current market price of gold, but now he elaborates on required gold reserves, finding that a return to the gold standard would be feasible in Eurozone as well as in the United States, but not in Great Britain.

Using a trade-weighted exchange rate index for Sweden, Bohlin (2010) observes a depreciation of the Swedish *krona* for the post-Bretton Woods period, 1973-2008, aided by three devaluations 1977-1982, which he attributes to higher inflation, and taking a longer perspective, Bohlin observes an appreciation period, 1915-1924 and a depreciation period 1977-1993, the latter bringing the exchange rate back to the approximately its pre-World War

I level, but the appreciation becomes smaller, excluding Germany 1913-23 from the exchange rate index, and thereby the German hyperinflation, but the Swedish exchange rate was stable both during the interwar Gold-exchange standard and the Bretton Woods system. He finds the free floating periods to involve larger fluctuations, appreciation 1915-1924 and depreciation 1993-2008. The appreciation in the former period we have seen, but what about depreciation in the latter. Figure 4 shows that Swedish exchange rates to the same set of countries as above has depreciated some after 1993 on Great Britain, Denmark, and Norway, but has been considerable on Germany and the Netherlands since 1973, but increasing after 1993.

[Figure 4 about here]

Turning to the Swedish exchange rate index on these countries, we can see, the divergence of currencies and a depreciation period for Sweden in 1993-2001, while the establishment of the euro, as the new currency of among others Germany and the Netherlands since 2002, after having had a 'eurostandard' for the old national currencies since 1998, seems to have brought stability.

[Figure 5 about here]

Figure 5 shows stability from 2002 up to the 2008 crisis, while Germany and the Netherlands has had a strong appreciation period on Sweden, but also the other three up to 2001, while Denmark, Norway, and Great Britain experienced a weak appreciation on Sweden. Could this reflect injection of liquidity in the Swedish economy? Figure 6 suggests that liquidity was relatively low in the post-Bretton Woods period, actually lower than during the interwar years, and decreasing in 1973-1993, thereafter being stable up to 2004 when it started increasing,

[Figure 6 about here]

The euro seems to have brought stability without restoring any Bretton Woods parity, but .the euro did not prevent the 2008 crisis. Nevertheless, the divergence of currencies in the the Baltic and North Seas region brings in the issue whether we would need to adjust parities continually to the market purchasing power of gold. This suggests an abstract unit of account, such as Meulen's (1934) banknote pound, which is a stable abstract unit of account expressing the price of gold, a price that varies with the market purchasing power of gold. An alternative would be Fisher's (1920) compensated dollar scheme, where the gold weight of the dollar is adjusted to changes in a comprehensive price index.

6. CONCLUSIONS

The aim of this paper was to compare the gold-exchange standard, which failed to prevent the 1929 crisis and some new gold standard that possibly could have prevented the 2008 crisis, that is weaknesses of the gold-exchange standard as monetary regime with the ability of a new gold standard to hypothetically have been able to prevent the crisis by constraining money and credit creation behind the 2008 crisis.

This involves an assessment of gold as monetary heuristic, based on a map, script, schema, or classifier system. The starting point is the conjecture developed by Wicksell, Mises, and Schumpeter, stressing credit money as that the value of money is its purchasing power, so that credit money liberates us from the gold constraint and that the value of gold is its purchasing power. This is supplemented by Keynes's analysis of credit money and the measure of purchasing power. Money is seen as a complex system, in which the monetary heuristics are seen in the perceived relative purchasing power of currencies, the exchange rate, under the gold standard expressed in terms of gold. Compared to the classical gold standard, the gold-exchange standard added to complexity, as foreign convertible currency was added to gold as legitimate central bank reserves.

In addition to being more complex, the gold-exchange standard was also more comprehensive than the classical gold standard, in explicitly recognizing private money, such as bills of exchange, as a part of total money, thus making gold supply a loose constraint. In the Baltic and North Seas region, there was monetary fragmentation, as newly independent states established their own currencies. There were in the interwar years a general desire to restore the gold standard, and some countries, such as the Scandinavian ones, pursued deflationary policies to restore the prewar parity, yet at different pace, while other countries created new currencies or restored the gold standard at a lower parity. A crucial problem was not the level, but the structure of global central monetary gold, that was very unevenly distributed, strongly concentrated to the United States and France, but also the Netherlands and Belgium possessed large gold reserves. Consequently, some countries held reserves mainly in foreign bills, while others had almost exclusively gold, thus preventing a smooth price-specie-flow mechanism and those having a large share of foreign reserves became more vulnerable to asset prices. The gold-exchange standard brought stability for some years, but failed to prevent the 1929 crisis and was not resilient, and the international monetary regime split into three blocs, giving unstable dynamics, which caused divergence among currencies.

Restoring the gold standard today in the post-Bretton Woods world, focuses on establishing parities corresponding to market purchasing power of gold. This raises the issue of having continual adjustment of the gold parity, otherwise a new gold standard would be like the euro, to which national currencies of the member countries were pegged eternally, before being altogether replaced. Furthermore, extant gold reserves are inadequate for having 100 percent reserves of M1, while adequate reserves are required, but that does not hold for all countries, again illustrating the importance of structure. The post-Bretton Woods period has brought divergence between currencies in the Baltic and North seas region, although the euro has brought stability, but yet it failed to prevent the financial crisis. The divergence in

the relative perceived purchasing power of currencies brings in the issue whether we would need to adjust parities continually to the market purchasing power of gold.

REFERENCES

Aoki, M. (2011). "Institutions as Cognitive Media between Strategic Interaction and Individual Beliefs." *Journal of Economic Behavior & Organization*, 79: 20-34.

Berg, C. & Jonung, L. (1999). "Pioneering Price Level Targeting: The Swedish Experience 1931-1937." *Journal of Monetary Economics*, 43: 525-551.

Boulding, K. E. (1978). *Ecodynamics: A New Theory of Societal Evolution*. Beverly Hills, CA: Sage.

Bohlin, J. (2010). "From Appreciation to Depreciation – The Exchange Rate of the Swedish Krona, 1913-2008." In: R. Edvinsson, T. Jacobsson, and D. Waldenström (Eds.), *Historical Monetary and Financial Statistics for Sweden: Exchange Rates, Prices, and Wages, 1277-2008."* Stockholm: Sveriges Riksbank with Ekerlids Förlag, 340-411.

Crisp, O. (1953). "Russian Financial Policy and the Gold Standard at the End of the Nineteenth Century." *Economic History Review*, New Series, 6: 156-172.

Denzel, M. A. (2010). *Handbook of World Exchange Rates, 1590-1914*. Farnham and Burlington, VT: Ashgate.

Drummond, I. A. (1976). "The Russian Gold Standard, 1897-1914." *Journal of Economic History*, 36: 663-688.

Edvinsson, R. (2010). "The Multiple Currencies of Sweden-Finland 1534–1803." In: R. Edvinsson, T. Jacobsson, and D. Waldenström (Eds.), *Historical Monetary and Financial Statistics for Sweden: Exchange Rates, Prices, and Wages, 1277-2008."* Stockholm: Ekerlids Förlag & Sveriges Riksbank, 133-237.

Edvinsson, R. (2012). "Early Modern Copper Money: Multiple Currencies and Trimetallism in Sweden, 1624–1776." *European Review of Economic History*, 16: 408–429.

Edvinsson, R. (2014). "Gross Domestic Product of Sweden within Present Borders, 1620-2012." In: R. Edvinsson, T. Jacobsson, and D. Waldenström (Eds.), *Historical Monetary*

and Financial Statistics for Sweden, Volume II: House Prices, Stock Returns, National Accounts, and the Riksbank Balance Sheet, 1620-2012." Stockholm: Ekerlids Förlag & Sveriges Riksbank, 101-182.

Edvinsson, R., & Ögren, A. (2014). "Swedish Money Supply, 1620-2012." In: R. Edvinsson, T. Jacobsson, and D. Waldenström (Eds.), *Historical Monetary and Financial Statistics for Sweden, Volume II: House Prices, Stock Returns, National Accounts, and the Riksbank Balance Sheet, 1620-2012.*" Stockholm: Ekerlids Förlag & Sveriges Riksbank, 293-338.

Eichengreen, B. (1987). *The Gold-Exchange Standard and the Great Depression*. National Bureau of Economic Research, Working Paper No. 2198.

Eichengreen, B. (1996). *Globalizing Capital: A History of the International Monetary System*. Princeton, NJ: Princeton University Press.

Eichengreen, B. & Temin, P. (2000). "The Gold Standard and the Great Depression." *Contemporary European History*, 9: 183-207.

Einaudi, L. L. (2000). "From the Franc to the 'Europe': The Attempted Transformation of the Latin Monetary Union into a European Monetary Union, 1865-1873." *Economic History Review*, 53: 284-308.

Einzig, P. (1962 [1970]). *The History of Foreign Exchange*, Second Edition. London: Macmillan.

Feinstein, C. H., Temin, P., & Toniolo G. (1997). *The European Economy between the Wars*. Oxford: Oxford University Press.

Fisher, I. (1920). *Stabilizing the Dollar: A Plan to Stabilize the General Price Level without Fixing Individual Prices*. New York: Macmillan.

Flandreau, M. (2000). "The Economics and Politics of Monetary Unions: A Reassessment of the Latin Monetary Union.1865–71." *Financial History Review*, 7: 25-44.

Gell-Mann, M. (1994). “Complex Adaptive Systems.” In: G. Cowan, D. Pines, and D. Meltzer (Eds.), *Complexity: Metaphors, Models and Reality*, Santa Fe Institute Studies in the Sciences of Complexity, Proc. Vol. XIX, 17-45.

Gigerenzer, G. (2008). *Rationality for Mortals: How People Cope with Uncertainty*. Oxford and New York: Oxford University Press.

Gillard, L. (2004). La banque d'Amsterdam et le florin européen au temps de la République neerlandaise, 1610–1820. Paris: L'École des hautes études en sciences sociales.

Gunning, J. P. (2010). “Incentive Divergence and the Global Financial Crisis.” In: S. Kates (Ed.), *Macroeconomic Theory and its Failings: Alternative Perspectives on the Global Financial Crisis.* Cheltenham & Northampton, VT: Edward Elgar, 65-95.

Hayek, F. A. von (1929). *Geldwerttheorie und Konjonkturtheorie*. Beitrage zur Konjunkturforschung, Österreichischen Institut für Konjunkturforschung, No.1.

Hayek, F. A. von (1931). *Prices and Production* (with a foreword of L. Robbins). London: Routledge.

Hayek, F. A. von (1952). *The Sensory Order: An Inquiry into the Foundations of Theoretical Psychology*. Chicago: University of Chicago Press.

Holland, J. H. (2006). “Studying Complex Adaptive Systems.” *Journal of Systems Science and Complexity*, 19: 1-8.

Hommes, C. (2013). *Behavioral Rationality and Heterogeneous Expectations in Complex Economic Systems*. Cambridge: Cambridge University Press.

Horwitz, S. (2010). “The Microeconomic Foundations of Macroeconomic Disorder: An Austrian Perspective on the Great Recession of 2008.” In: S. Kates (Ed.), *Macroeconomic Theory and its Failings: Alternative Perspectives on the Global Financial Crisis.* Cheltenham & Northampton, VT: Edward Elgar, 96-111.

Huerta de Soto, J. (2006). *Money, Bank Credit, and Economic Cycles*. Auburn, AL: Ludwig von Mises Institute.

Human, O. & Cilliers, P. (2013). "Towards an Economy of Complexity: Derrida, Morin and Bataille." *Theory, Culture & Society*, 30: 24-44.

Jonung, L. (1979). "Knut Wicksell's Norm of Price Stabilization and Swedish Monetary Policy in the 1930s." *Journal of Monetary Economics*, 5: 459-496.

Kates, S. (2010). "The Crisis in Economic Theory: The Dead End of Keynesian Economics." In: S. Kates (Ed.), *Macroeconomic Theory and its Failings: Alternative Perspectives on the Global Financial Crisis.* Cheltenham & Northampton, VT: Edward Elgar, 112-126.

Keynes, J. M. (1930a). *A Treatise on Money, Volume I: The Pure Theory of Money*. London: Macmillan & Co.

Keynes, J. M. (1930b). *A Treatise on Money, Volume II: The Applied Theory of Money*. London: Macmillan & Co.

Klovland, J. T. (1998). "Monetary Policy and Business Cycles in the Interwar Years: The Scandinavian Experience." *European Review of Economic History*, 2: 309-344.

Lobell, H. (2010). "Foreign Exchange Rates 1804-1914." In: R. Edvinsson, T. Jacobsson, and D. Waldenström (Eds.), *Historical Monetary and Financial Statistics for Sweden: Exchange Rates, Prices, and Wages, 1277-2008.*" Stockholm: Sveriges Riksbank with Ekerlids Förlag, 291-339.

Meulen, H. (1934). *Free Banking: An Outline of a Policy of Individualism*. London: Macmillan.

Mises, L. von ([1912] 1924). *Theorie des Geldes und der Umlaufsmittel*. Second Revised Edition, Munich and Leipzig: Duncker & Humblot.

Mises, L. von (1928). *Geldwertstabilisierung und Konjunkturpolitik*. Jena: Gustav Fischer.

Morin, E. (2007). "Restructed Complexity, General Complexity." In: C. Gershenson, D. Aerts, & B. Edmonds (Eds.)**,** *Worldviews, Science and Us: Philosophy and Complexity.* Singapore: World Scientific, 1-25.

Quinn, S., & Roberds, W. (2014). "How Amsterdam Got Fiat Money." *Journal of Monetary Economics*, 66: 1-12.

Redish, A. (2000). *Bimetallism: An Economic and Historical Analysis*, Cambridge University Press.

Rodrik, D. (1997). "Sense and Nonsense in the Globalization Debate." *Foreign Policy*, 19-37.

Roover, R. de (1948). *Money, Banking, and Credit in Medieval Bruges: Italian Merchant-Bankers, Lombards, and Money Changers: A Study in the Origin of Banking*, Cambridge, MA: The Medieval Academy of America.

Schank, R. C., & Abelson, R. P. (1977), *Scripts, Plans, Goals, and Understanding*, Hillsdale, NJ: Lawrence Erbaum.

Schumpeter, J. A. (1917–18). "Das Sozialprodukt und die Rechenpfennige. Glossen und Beiträge zur Geldtheorie von heute". *Archiv für Sozialwissenschaft und Sozialpolitik, 44*, 627-715. Reprinted in Schumpeter, J. A., (1952). *Aufsätze zur ökonomischen Theorie*. Tübingen: J. C. B. Mohr.

Schumpeter, J. A. (1970). *Das Wesen des Geldes*. Edited by F. K. Mann. Göttingen: Vandenhoeck & Ruprecht.

Shaw, W. A. (1985). *The History of Currency, 1252 to 1894: Being an Account of the Gold and Silver Monies and Monetary Standards of Europe and America, Together with an Examination of the Effects of Currency and Exchange Phenomena on Commercial and National Progress and Well-being*. London: Wilsons & Milne.

Wetterberg, G. (2009). *Pengarna & makten. Riksbankens historia*. Stocholm: Atlantis & Sveriges Riksbank.

White, L. H. (2011). "A Gold Standard with Free Banking Would Have Restrained the Boom and Bust," *Cato Journal*, 31: 497-504.

White, L. H. (2012). “Making the Transition to a New Gold Standard,” *Cato Journal*, 32: 411-21.

White, L. H. (2015). “The Merits and Feasibility of Returning to a Commodity Standard,” *Journal of Financial Stability*, 17: 59-64.

Wicksell, K. ([1906] 1966). *Föreläsningar i nationalekonomi, Häfte II: Om penningar och kredit*. Fifth Edition. Lund: Gleerups.

Øksendal, L. F. (2007). “The Impact of the Scandinavian Monetary Union on Financial Market Integration.” *Financial History Review*, 14: 125-148.

Figure 1. *Swedish Exchange Rates on Great Britain, Denmark, Norway, Germany, and the Netherlands, 1913-1939*
(SEK per 10 GBP, 100 DKK, 100 NOK, 100 mark(1913-23)/reichsmark(1934-39), and 100 NLG)

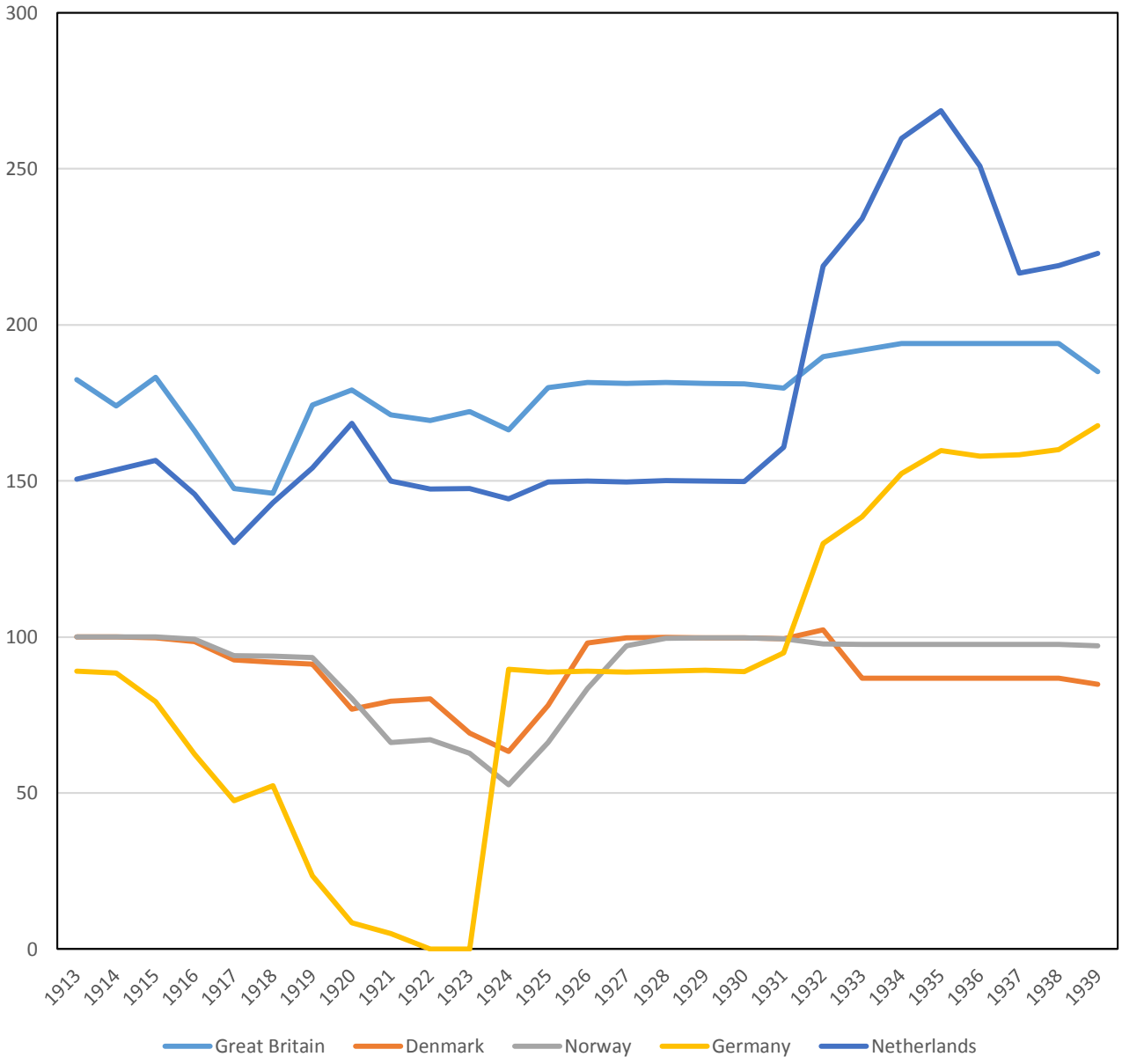

Figure 2. *Swedish Exchange Rate Index on Great Britain, Denmark, Norway, Germany, and the Netherlands, 1939-1939* (1913=100)

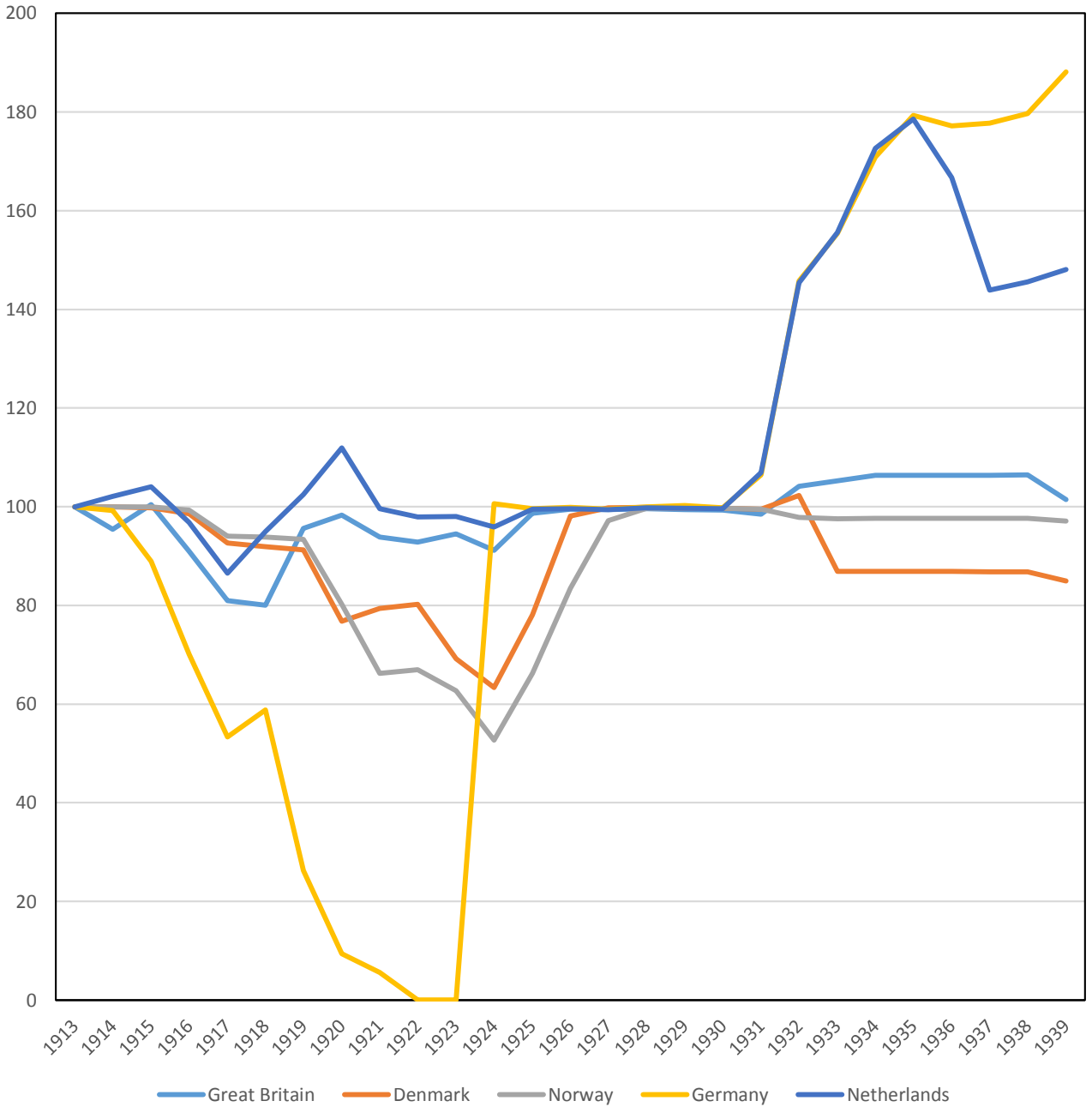

Figure 3. *Liquidity and Share of Bank Money of the Swedish Economy, 1913-1939*

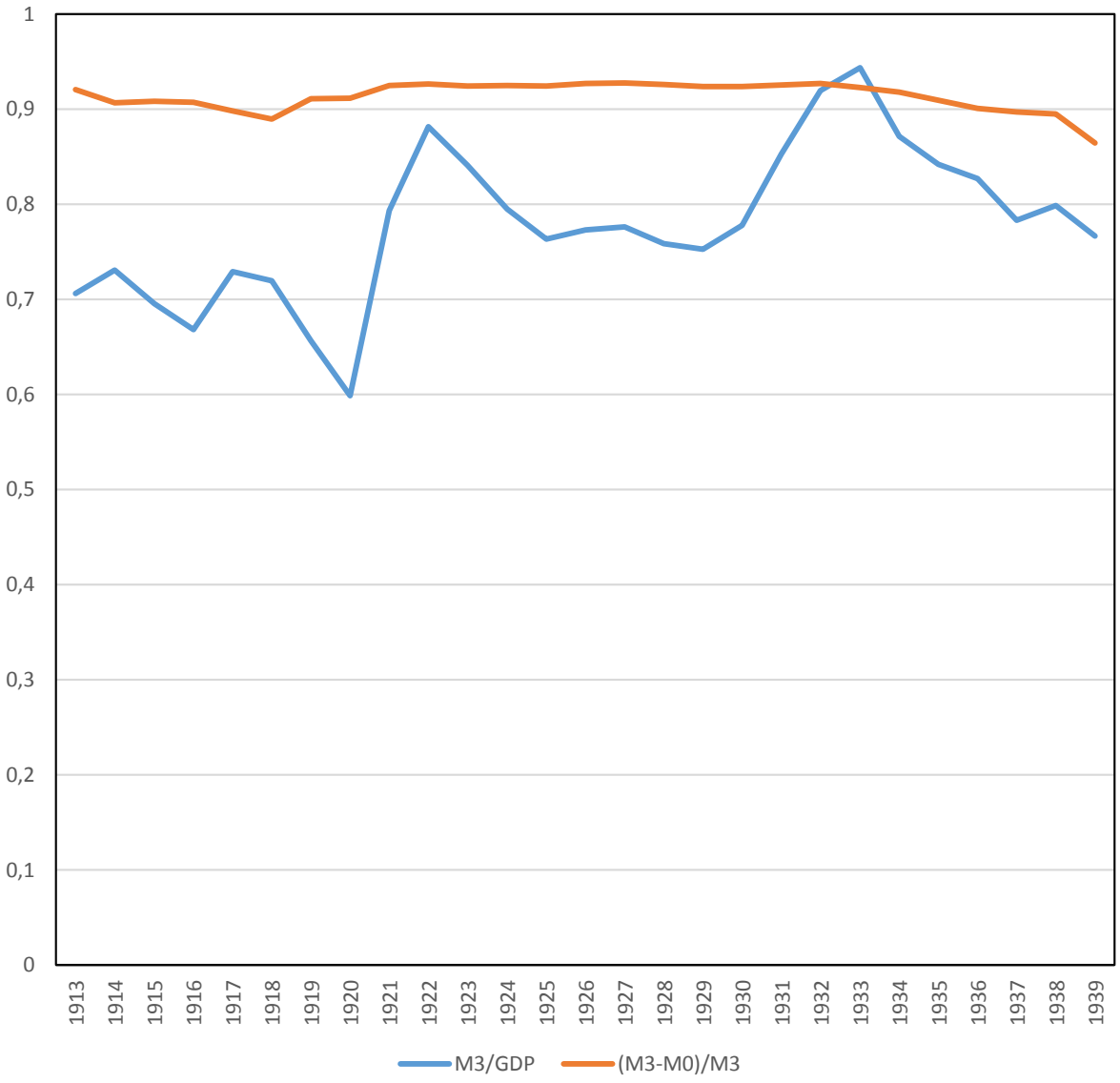

Figure 4. *Swedish Exchange Rates on Great Britain, Denmark, Norway, Germany, and the Netherlands, 1973-2008*
(SEK per 10 GBP, 100 DKK, 100 NOK, 100 DEM, 100 NLG, and 10 EUR)

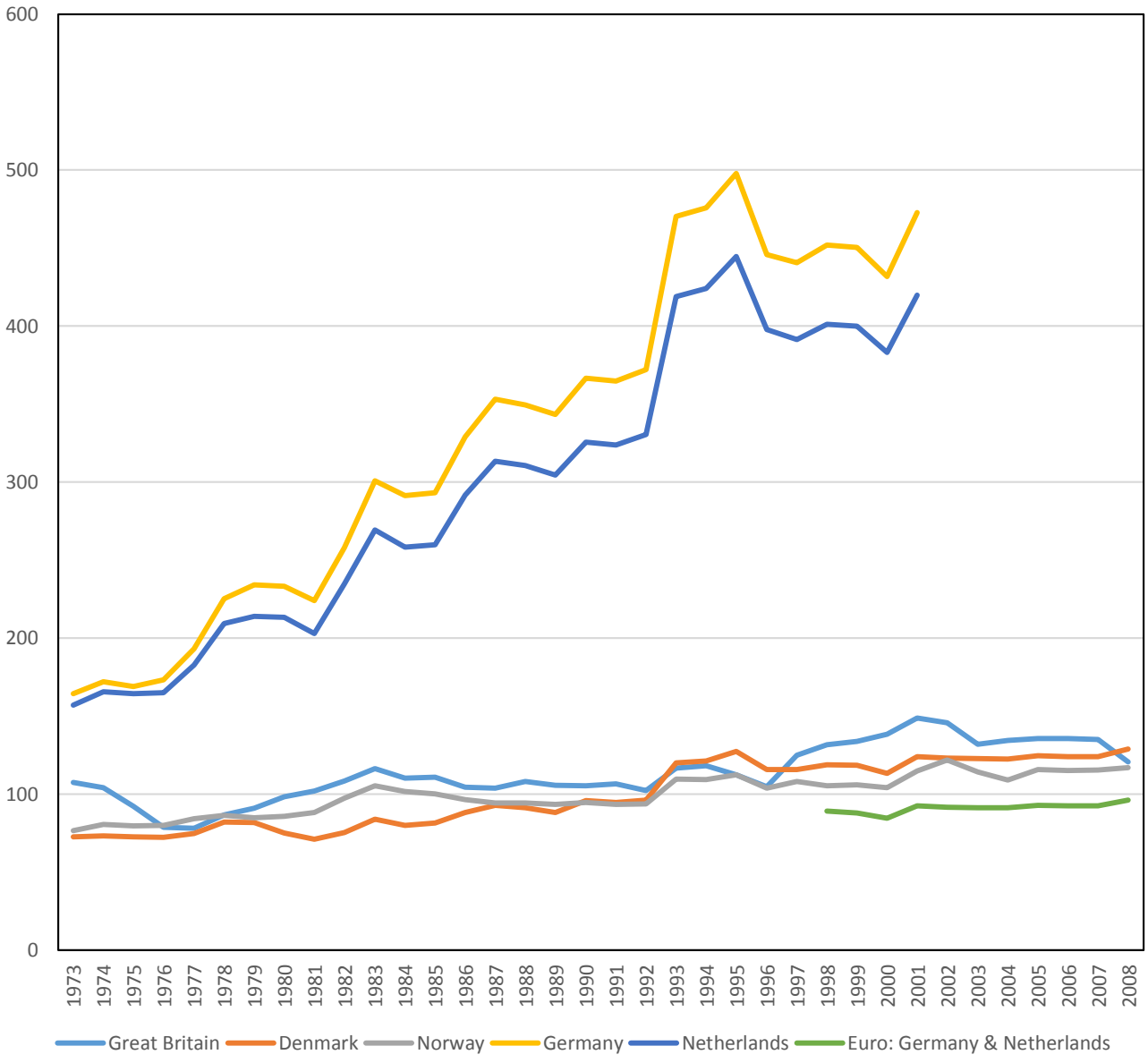

Figure 5. *Swedish Exchange Rate Index on Great Britain, Denmark, Norway, Germany, and the Netherlands, 1973-2008*
(1973=100)

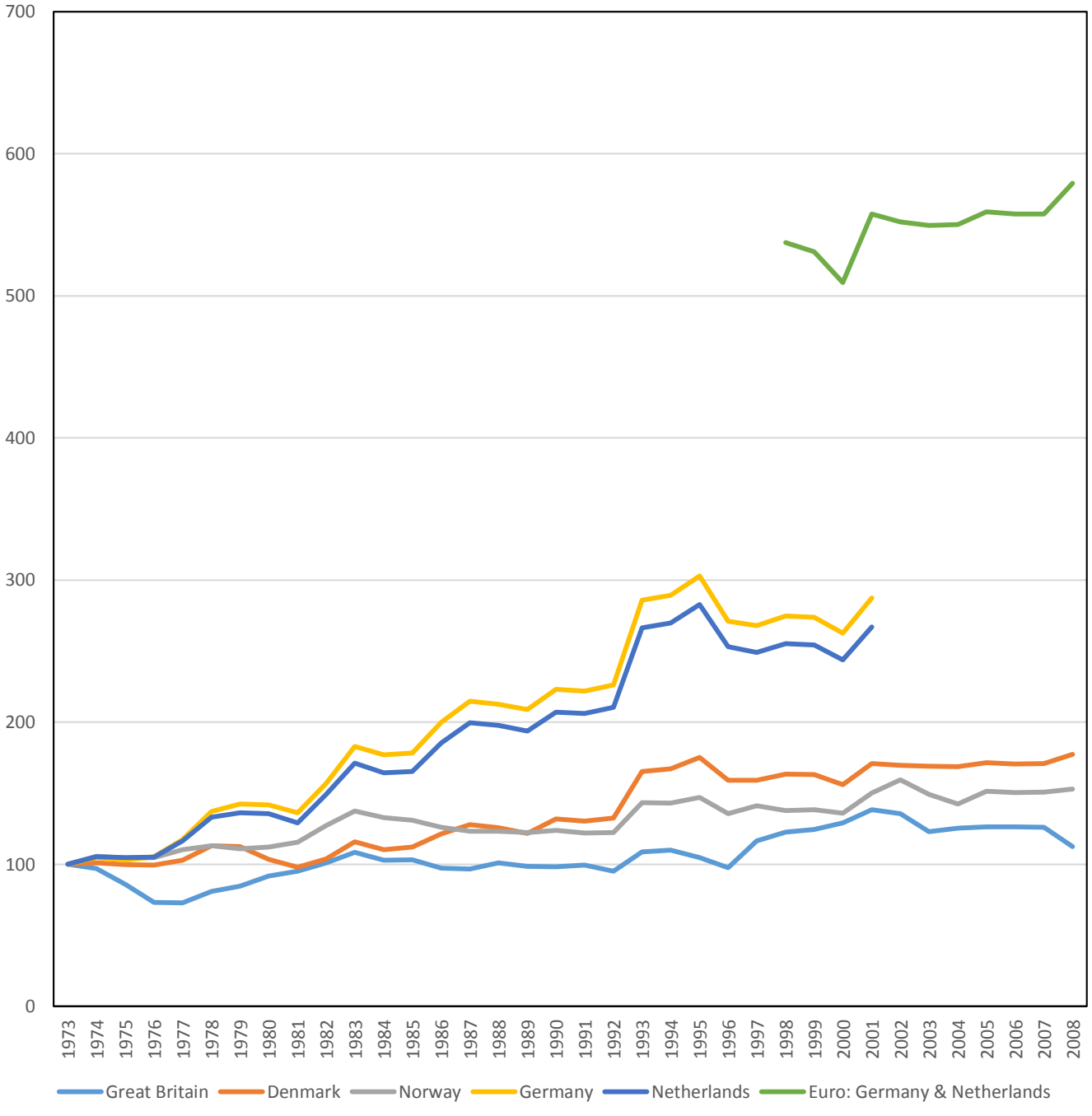

Figure 6. *Liquidity and Share of Bank Money of the Swedish Economy, 1973-2008*