

Monetary Systems

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ABSTRACT: Throughout modern international finance, different monetary regimes existed. International monetary arrangements initially arose from the need to provide international trade with easy means of settling trans-border payments (Semmler 2019). For centuries, both domestic and international trade was carried out using gold and silver (Semmler 2019). The Gold standard during the Interwar Period since 1870, the Bretton Woods system and the following Euro currency introduction. This essay summarizing the differences between the three Monetary and currency systems: Gold standard, Bretton Woods and Euro-System and highlights the success and failures of the different approaches to guide monetary matters throughout history.

KEYWORDS: Bretton Woods System, Central Banks, Currency System, Economic Stability, Euro Currency, Finance, Fiscal Policy, Gold standard, History, International Trade, Monetary Policy

Introduction

Money has different forms and faces. (The functions of money are being a medium of exchange, balance of account, measure and store of value, international money and most recently crypto currency side market). From precious gold, silver and copper coins to paper claims on gold and finally fiat money guaranteed by a sovereign in the 19th century emerged first the Gold standard period since 1870, which featured a stable peg and exchange rate of international currencies to gold, later on the dollar and pound were starting to take over that role, while stably being pegged to gold. The banking crisis of the Great Depression during the prolonged crisis in the interwar period and the success of the Gold standard being seen as highly controversial and unsuccessful attempts to restore the gold standard led to the Bretton Woods system (Fisher 1933 in Bordo 1999; Galbraith 2014; Kindleberger & Alibar 2006; Minsky 1995). The Bretton Woods system featured a fixed exchange rate system of the USD (=United States Dollar) and gold as well as the GBP (=Great Britain Pound) to gold. Both currencies were meant to be fully convertible to gold at all time, which created problems of feasibility and current account deficits for the monetary authority countries United States and Great Britain. The European Monetary Union (EMU) was created in 1978 when all back-then European Union-predecessor members joined and Britain followed in 1990. The EMU started out with the creation of the so-called snake within a tunnel, a construct to have currency fluctuations ranging only between a margin of +/- 2.25 percent and the central bank intervening when currency fluctuations move beyond the set limited bandwidth. From the European Currency Union featuring the European Currency Unit (ECU) a fictitious banking currency, the European Union incepted the Euro as single fiat payment method in most economically developed European Union (EU) member states.

The current system in place is a mixture of systems, ranging from groups of economies that peg their exchange rates to each other, to countries whose exchange rates are determined primarily by economic forces, with a wide range of managed floaters' in between (Semmler 2019). The paper summarizes the differences between the three major monetary and currency systems: Gold standard, Bretton Woods and Euro-System highlighting the differences and success and failures of these historically grown, most important monetary regimes.

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2. Monetary regimes

2.1 Gold standard and Interwar Period

In Great Britain emerged from the Peel's Act in 1819, the gold standard was significant for gold and silver coexisting but bank notes circulated alongside. Gold as a medium of exchange was too costly (less than 100% coverage) and too precious.

The Gold standard evolved out of the variety of commodity-money standards that emerged before the development of paper money and fractional reserve banking. The predecessor was the Latin Monetary Union, in which Belgium, France, Italy, Switzerland and Greece harmonized their silver coinage on a common basis (Eichengreen 1996). Starting in 1870, from 1879 to 1914 the bimetalism was abandoned (Eichengreen 1996). Central banks were created following the goal to defend the exchange rate with gold as the underlying currency. First the fixed exchange rate was active in terms of the dollar to ounce and British pound to ounce, later this shifted into an exchange rate between dollars and British pounds. No discretionary monetary policy was possible (Semmler, in speech). The Gold standard is often seen as an automatic mechanism that takes the money supply (monetary policy) out of the hands of policy makers. The Gold standard gives rules priority to discretion (Kydland & Prescott 1977; Barro & Gordon 1983). By the beginning of the twentieth century, there had finally emerged a truly international system based on gold (Eichengreen 1996). The association of the gold standard with deflation dissolved and the dollar's position was solidified by passage of the Gold Standard Act of 1900 (Eichengreen 1996). The political period of peace in Europe from 1871 to 1913 facilitated the international cooperation that was needed to support the system.

The second phase of the Gold standard was the Interwar Period, which featured *free floating* from 1919 to 1926 in the interwar period. Thereby most countries went off the Gold standard except the US. Great Britain returned in 1919, whereby the British pound was first under-valued and then over-valued. Countries like Germany that had been international creditors were reduced to debtor status and became dependent on capital imports from the US for the maintenance of external balance. Germany joined the gold standard after hyperinflation in 1924, then France too. And among the first countries to reestablish gold convertibility were those that had endured hyperinflation, such as Austria, Germany, Hungary and Poland. New currencies were issues whose supplies were governed by the provisions of gold-standard laws. Reserves were replenished by loans endorsed by the League of Nations. Yet the growth of political and military tensions between Germany, France and Britain after the war eroded the solidarity upon which financial cooperation has to be based (Eichengreen 1996). Characterized by various periods of monetary instability and economic chaos (such as the 1921-1923 hyperinflation of the Weimar Republic and the 1929-1933 Great Depression); the interwar period saw fluctuating exchange rates as countries widely used "predatory" depreciations of their currencies as a means of gaining advantage in the world export market. Attempts were made to restore the gold standard, but participants faced various domestic problems and lacked the political will to "follow the rules of the game." The result for international trade and investment was profoundly detrimental. The interwar gold standard resurrected in the second half of the 1920s with labor and commodity markets lacking traditional flexibility. The new system could therefore not accommodate shocks. In the interwar period precious metal became an essential resource for purchasing abroad the supplies needed to fuel war preparations. With gold market arbitrage disrupted, exchange rates began to float. Of all major currencies, only the dollar remained freely convertible into gold. Central banks did not intervene in foreign-exchange markets and therefore the first half of the 1920s provides a relatively clean example of a floating exchange rate regime (Eichengreen 1996).

The *weak gold standard* period between 1927 to 1931 weakened gold as reserve currency for the dollar and pound. Britain – with low stock of gold – suspended 1931 convertibility with the Sterling floating.

The third period of *managed float* from 1931 to 1939 during the Great Depression featured competitive devaluation of currencies, decline of world trade, a US embargo on gold export in 1933 and finally the collapse of the gold standard. By 1932, the international monetary system featured three blocs: The residual gold standard countries led by the US, the sterling area led by Britain with countries pegged to the pound sterling and Central and Eastern European countries led by Germany, where exchange control prevailed.

Advantages of the gold standard are the function as an automatic stabilizer of the balance of payment. The Hume mechanism is a self-correcting mechanism through outflow and inflow of gold, which allows inflation rate and export competitiveness adjustments. Perhaps the most remarkable feature of the model remains its durability – developed in the eighteenth century, it remains the dominant approach to thinking about the gold standard today (Eichengreen 1996). Another cornerstone of the prewar gold standard was the priority attached by governments to maintaining convertibility. In the countries at the center of the system – Britain, France and Germany – there was commitment that officials would ultimately do what was necessary to defend the central bank's gold reserve and maintain the convertibility of the currency (Eichengreen 1996). Central banks therefore followed the market, adjusting bank rates to track market interest rates.

The gold standard lasted less than forty years from 1879 to 1914 as the success of the Gold standard remains highly controversial. The one-target-focus of the central bank to manage exchange rates through gold is seen critical amidst inflation and unemployment fluctuations during the time the Gold standard was practiced. Therefore, today central banks pursue multiple targets. With the liberalization of capital markets and cross-border financial investment and trade, gold flows are only a fraction of trade flows and balance of payments positions. The net capital movements are larger than trade balances. Reaction of capital flows to financial market returns underline the role of the interest rates and discount rates for the stability of economies. Adjustment mechanisms create huge fluctuation in unemployment and deflationary periods. There is a conflict of gold being a reserve and serving other functions.[†] The change of financial centers and rise of other reserves held in the shift from gold to US dollar and British pound took away the power of gold. 19th century globalization has leveraged capital flows more welfare enhancing than trade flows, yet since the 1970s capital flows are less welfare enhancing.

During the Great Depression, asset and equity prices fell after 1929, leading to a home and agriculture price fall. With the price fall occurred a fall of farmers' revenues. Due to fixed nominal debt payment and real interest rate rising (Fisher effect) banks had large loan losses. Central banks then changed reserve holdings towards gold in a run into gold, leading to a giving up of the gold standard and reserves being run down. The expected depreciation of the currency triggered then capital flights and put pressure on the banks' liability side during banks runs, which caused insolvency of US banks. Banks closed in Austria and Germany during similar financial crises to avoid banks as magnifiers of the crisis in the economy (Semmler 2019).

Comparing to post-war periods, the gold standard period is marked by lower and variable growth, little inflation, and lower monetary supply growth. Benefits of the gold standard include that money supply is strictly determined by the stock of gold, which increases credibility of monetary policy and maintains long run price stability (hyperinflation is almost impossible). The price-specie-flow mechanism automatically regulates the balance of payment for each country. It does not require a particular country to be at the center, avoiding conflicts about which country it should be. Major drawback in the gold standard was that this regime required a rigid monetary rule and a fixed exchange rate regime. By the Hume mechanism, a trade deficit caused a shrinking money supply, while a surplus meant an expanding money supply. Both processes act to equilibrate trade imbalances (Semmler 2019). Countries on gold standard circumvented the tight theoretical link between gold tenders and sales at the central bank, trade balances and

[†] $BoP = BoT + \text{Change of Reserves}$, whereby $BoP = \text{Balance of Payments}$, $BoT = \text{Balance of Trade}$

changes in the monetary supply. In reality only four countries (England, Germany, France and the United States) maintained a pure gold standard in the sense that money circulating internally took the form of gold coin. And even in those four countries, adherence to the gold standard was tempered. Devices were needed for encouraging gold inflows and discouraging outflows such as central banks extending interest-free loans to gold importers to encourage inflows. Gold physically had to be moved from one central bank to another. Those with multiple branches, like the Bank of France and the German Reichsbank, could obtain gold by purchasing it at branches near the border or at a port, reducing transition time and transportation costs. They could discourage gold exports by redeeming their notes only at central office. They could raise the buying and selling price for gold bars or redeem notes only for worn and clipped gold coins. Profitability of central banks became an issue, as if the central bank set the discount rate above market interest rates, it might find itself without business. Another consideration was that raising interest rates to stem gold outflows might depress the economy. Interest rate hikes increase the cost of financing investments and discourage the accumulation of inventories. Finally, central banks hesitated to raise interest rates because this would increase the cost to the government of servicing its debt (Eichengreen 1996). Gold standard implies favoring rules over discretion. Domestic money supply is largely a function of external balance and there is little room for monetary policy. This makes the economy vulnerable to macroeconomic shocks; problems like unemployment and economic distress tends to persist. The total supply of gold depends on discovery of gold mines (which is usually random). The growth of international trade tends to be hampered by the limited growth of liquidity. Since the total world reserve of gold is limited, the total money supply is also limited, an economy under gold standard will be constantly subjects to deflation problems. Another limitation of the gold standard was the inability to anticipate and moderate predictable cycles. For this, central bank rates had to lead market rates rather than follow them. The harmonization of policies throughout a compound of countries yet was difficult in turbulent times and there was often a conflict between domestic and international financial stability. In terms of economy policy, Gold standard was prioritized over domestic economic concerns (such as unemployment and inflation) because of the ignorance of necessity of governmental intervention.

2.2 The Bretton Woods System

The evolution of a new monetary system after the First World War can be seen as a series of ad hoc responses to international crises and system inadequacies (Semmler 2019). The Bretton Woods system was designed to void the competitive devaluations of the interwar period by establishing a system of fixed exchange rates based on the US dollar's link to gold (Semmler 2019). Partially emerged out of the European Payments Union that was formed to deal with Europe's trade and payments problems; the Bretton Woods System monetary regime started in July 1944 and was the predominant monetary world order until 1971/3. The IMF and central banks were thereby enacting global monetary and financial stability.

Based on the Keynes and White Plans, the Bretton Woods system was created in July 1944 in order to combat problems of competitive devaluations, volatility of floating exchange rates and dual financial power centers of the US and UK. While the US argued for a fixed exchange rates regime and the UK for an adjustable, the compromise was enacted by following an adjustable peg. Countries were required to declare par values for their currencies in terms of gold or a currency convertible into gold, which in practice meant the dollar, and to hold their exchange rates within 1 percent of those levels (Eichengreen 1996). Par values could be changed to correct a fundamental disequilibrium by 10 percent following consultations with the Fund but without its prior approval, by larger margins within the approval of three-quarters of Fund voting power (Eichengreen 1996). The Bretton Woods system substantially improved the degree of exchange rate stability and dispatched payments problems, permitting the unprecedented expansion of international trade and investment in the postwar boom period (Eichengreen 1996). A new institutional arrangement featured

- (1) the creation of the International Monetary Fund (IMF),
- (2) a fixed exchange rate (with only 1% fluctuations around par value allowed and actual currency convertibility since 1958). These pegged exchange rates became adjustable, subject to specific conditions known as fundamental disequilibrium,
- (3) gold dollar parity (USD 35 per ounce of gold),
- (4) and the IMF was created by funds provided by its member states, of which was 25% in gold, which were used as resources for lending to member states to keep parity and special drawing rights (SDR) since 1967 based on the credit positions of its member states (Eichengreen 1996). The IMF was meant to monitor national economic policies and extend balance-of-payments financing to countries at risk. Overall, capital controls were permitted to limit international capital flows (Krugman & Obstfeld 1977).

Problematic appears in the exchange rate stabilization the Triffin Paradox with the US dollar being pegged to gold requiring the US to hold gold reserves. As the US provides the world dollars, this leads to a constant trade deficit of the US with the world. The constant claims of the world of dollars required to higher the gold reserves in Fort Knox. The US current account deficit with world trade rising also created a constant and rising need for USD of the world, but the US had no additional sources to acquire gold. An economic crash after the Vietnam War and De Gaulle turning USD into gold led to the abandoning of the Bretton Woods system for IMF control. Thereby the US could not guarantee dollar to gold convertibility anymore. So convertibility problems from the end of the 1960s on led to the final collapse of the Bretton Woods system in 1971. While the pegging to the dollar was strong as a principal reserve currency, it was weak in the growing negative dollar balance that raised doubts in its actual convertibility and costs of supporting the dollar became high (Eichengreen 1996). In addition, the restoration of current-account convertibility limited the possibility of tightening import licensing requirements (Eichengreen 1996). Countries became reluctant to devalue in response to external imbalances as they had to obtain fund approval before changing and fear that this signal leaking to the market would change outcomes for countries to a negative (Eichengreen 1996). The willingness to devalue gave rise to expectations that the authorities would value again and exposed currencies to attacks by speculators (Eichengreen 1996). Problems of imbalances include maintaining a fixed-exchange-rate systems between convertible currencies require credit to finance imbalances. Weak-currency countries tend to need more generous credits (from IMF) to offset speculative outflows, while strong currency countries are not happy with it (because strong currency countries are major contributors of the IMF funds).

As long as foreigners were willing to hold dollars, the US could finance the large balance of payments deficits by increasing holdings of official assets. Yet as the gold reserve of the US declined over the entire period, the gold backing diminished leading to convertibility and credibility problems. As a consequence to all the outlined deficiencies, since 1972 the price of gold compared to the USD and GBP went up and fluctuated freely. The end of the dollar-gold convertibility is associated with less volatility of inflation rates and output compared to before. Parity changes, especially by the industrial countries at the center of the system, were extraordinarily rare. Fixed exchange rates having no transaction cost fluctuations may also invite too much risk taking without being penalized or facing risk in markets (Summers in Semmler 2019).

Since then, the IMF took over a leading role in monetary stabilization with special drawing rights and as watch-dog in terms of the conditionality of loans (Burda & Wyblosz 1997). IMF provides surveillance and monitoring of national institutions. Especially the IMF research department focuses on developmental and global issues as well, such as inclusive growth, stabilizing unemployment, wealth distribution, sustainable development, gender equality, poverty alleviation and climate stabilization. Problems faced by the IMF research department include the merit-based appointment of its staff members who need to convince politically-appointed executives within the institution. Overall, the collapse of the Bretton Woods system was due to the internal inconsistency of a system that required increasing amounts of international reserves to be provided by the US, which were needed to be convertible into gold by definition (Semmler

2019). The large US balance of payment deficits that emerged in the late 1960s out of that necessity created a dollar overhang of official external liabilities which by far exceeded the American real gold assets (Semmler 2019).

2.3 European Monetary Union

The end of the Bretton Woods system around 1971-3 led to the creation of the European Monetary System (EMS) first called Snake, which lasted until September 1991 and later became the European Monetary Union from 2000 on, which featured the Euro as a single currency for most of the European Union member states.

From the Maastricht Treaty in 1992 to the Stability Pact in 1996 in Dublin and the Amsterdam Treaties in 1997 the European single market project developed with a European Exchange Rate Mechanism, leading to a 1999 to 2002 transition stage, in which there was the introduction of a single currency within most of the EU countries since 1.1.2002 (Burda & Wyblosz 1997). The Euro featured advantages of saving on transaction and hedging costs of highly integrated economies, avoid volatility of exchange rates and lower the dominance of the Deutsche Bundesbank, the German central bank, within the European compound.

First the snake would imply that if a currency would move close to a set ceiling of marginal fluctuation bandwidth of +/- 2.25 percent, then the central bank would intervene in speculations. This kind of fixed or pegged exchange rate regime was aimed at stabilization between banks and monetary realignments system of currency fluctuations. In the emergence of the Snake bank currency fluctuations bandwidth was broadened, which either led to flexible exchange rate systems or a single currency monetary union (EMU) featuring a European Currency Unit (ECU) and borrowing facilities among members of central banks' consortia that realigned decisions strategically. The monetary policies remained thereby independent.

Between 1999 and 2002, the EMU arranged monetary policies to once central bank, the European Central Bank (ECB), within 12 member banks with a two pillar concept of monetary decisions – to set the interest rate and determine the optimal quantity of money via the exchange rate, now the Taylor rule of the interest rate. The fiscal policy was laid out in the Maastricht treaty in 1992 with a deficit of lower than or equal to 3 percent of GDP and a penalty mechanism for violations – although Germany violates this often themselves – and a debt ratio of lower than or equal 60 percent of GDP. Due to feasibility constraints, the debt limit has been relaxed. Weak fiscal arrangements and no bail out clauses or fiscal union cause for later sovereign debt crises in the EU, foremost Greece in 2009 and 2010.

Lastly, the EMU introduced the Euro as single currency in a common European Union financial union in which the member states have given up monetary policy fixed exchanges rates for the lead by the European central bank. The central banks thereby use a sterilization policy through open market operations, such as in the case of money transfers between countries.

The European Monetary System in practice features exchange rate stability and convergence of the interest rate. A special feature is the closeness to the Deutsche Bundesbank and countries joined borrowing the Bundesbank credibility (Burda & Wyblosz 1997).

The Euro as a single currency within Europe was successful until the 2008 world financial recession, when the US financial market meltdown led to the Euro crisis or sovereign debt crisis pressuring Grexit – or exit of Greece – talks. Advantageous appears that countries are allowed for a higher band of fluctuations; but the downside is that there can be huge or lasting currency crisis such as in Greece.

To this day, problems remain – foremost EU crises such as the 2007/08 financial market and banking crisis, the 2011/12 sovereign debt crisis and the 2015 policy crisis with Greece debt repayment requirements. Today Italy as highly indebted country using the Euro and Spain and Portugal being in debt as well. Financial stress tests indicate that there is a doom loupe of governmental spread between interest rates – foremost between Italy and Germany, but also Germany to Spain, Belgium, France and Greece. Amplification mechanisms of EU banking and sovereign debt crises are externalities, contagion, fire sale of assets and vicious cycles that are

triggered by bad shocks that lead to a decline in net worth, capital demand and prices to drop (Brunnermeier & Oehmke 2013; Brunnermeier & Sannikov 2010). If net worth declines, the refinancing and prices of assets in markets decline, which makes loan financialization harder. When sovereign debt risks rise, within banks the loans to firms decline as bank debt rises and equity risks increases. This leads to an overall growth decline or contraction in the real economy, leading to a tax decline, which again raises the sovereign debt risk. In this doom loupe the bailout probability rises causing additional stress to sovereign debt accumulation. The economy and crises can thereby become to a self-fulfilling prophecy, in which there are overall two equilibria, one stable and one unstable (De Grauwe 2012; Draghi 2012; Mittnik & Semmler 2014; Schleer & Semmler 2014). The stable equilibrium economy features low interest rates, sustainable debt levels and no crisis; in the unstable equilibrium, the probability of default rises, because of high debt, interest rate rising, which raises the debt and default risk and adverse macro feedbacks set in. Low moving debt crises follow that are still not resolved today (Arellano 2008, 2014; Mittnik & Semmler 2013; Roch & Uhlig 2014; Schleer & Semmler 2014; Semmler & Proaño 2015). The so-called “bad equilibrium” is an equilibrium where you have self-fulfilling expectations that generate, that feed upon themselves, and generate adverse scenarios (Draghi 2012). While these negative developments in markets were not mentioned or thought of in the original treaties to form the EMU or Euro; foremost central banks are now needed to intervene to break these expectations. The default risk equilibrium thereby is a slow moving debt crisis. In a so-called corridor stability (Keynes), small shocks do not have any impact, the shock gets absorbed. Yet, if there is a big shock, these have impacts on inventory, buffers and price stability. The role of central banks and the IMF is to monitor and make stability predictions of different countries. After the crisis there appears a divergence of different fiscal policy approaches in the EU, which appears problematic. Future endeavors may construct a fiscal union or more aligned fiscal cooperation to combat debt crises but also two equilibria problems of a stable and an unstable equilibrium in modern economies.

Problematic appears the question if the Euro-area is an optimum currency area (Mundell 1961 in Semmler 2019). Contemporary concerns are spillovers from private to sovereign debt in the EU. Mortgage debt are rising in the EU in Italy, Spain, Ireland and Greece (Stein, 2011, 2012 in Semmler 2019). If leading to a debt explosion in the banking system leading to loan losses, the banks become more constraint. Sovereign debt can thereby trigger a banking crisis that leads to bail of banks and increases sovereign debt crisis in a self-fulfilling prophecy or doom loupe.

3. Discussion

The current system in place is a mixture of systems, ranging from groups of economies that peg their exchange rates to each other (e.g., Argentinean Peso pegged to the USD), to countries whose exchange rates are determined primarily by economic forces, with a wide range of managed floaters’ in between (Semmler 2019). The advantage of fixed and floating exchange regimes are still debated to this day. Flexible exchange rates were declared acceptable to the IMF members and gold was abandoned as an international reserve asset (Yang 2019). Floating (Flexible) ex rates – the ex-rates are determined by the market forces of demand and supply and no intervention is needed in general (Yang 2019). Some countries maintain quasi-fixed exchange rate regime in usually around a band of the fixed rate against an anchoring currency such as US dollar or British Pound Sterling (Yang 2019). Floating exchange rates may subject countries to large and costly short-run swings in nominal and thus real exchange rates. Fixing the exchange rate not only requires knowledge of the appropriate real exchange rate, but also presupposes the ability to discern changes in underlying fundamentals – real shocks to competitiveness and wealth, among other things – that would require changes in the real exchange rate (Semmler 2019). As economic policies of countries have external effects on their neighbours, summity is a rational economic response to this problem and demonstrates the potential value of economic cooperation (Semmler 2019).

References

- Arellano, C. 2008. "Default risk and income fluctuations in emerging economies." *American Economic Review* 98 (3): 690-712.
- Arellano, M. 2014. "Uncertainty, persistence, and heterogeneity: A panel data perspective." *Journal of the European Economic Association* 12: 1127-1153.
- Barro, R.J. & Gordon, D.B. 1983. "Rules, discretion and reputation in a model of monetary policy." *Journal of Monetary Economics* 12(1): 101-121.
- Burda, M. & Wyplosz, C. 1997. *Macroeconomics: A European text*. Oxford, UK: Oxford University Press.
- Bordo, M.D. 1999. *The gold standard and related regimes: Collected essays*. Cambridge and New York: Cambridge University Press.
- Brunnermeier, M.K. & Oehmke, M. 2013. „The maturity rat race." *Journal of Finance* 68(2): 483-521.
- Brunnermeier, M.K. & Sannikov, Y. 2010. „A macroeconomic model with a financial sector." *American Economic Review* 104(2): 379-421.
- De Grauwe, P. 2012. "The governance of a fragile Eurozone." *The Australian Economic Review* 45(3): 255-268.
- Draghi, Mario. 2012. Verbatim of the remarks made by Mario Draghi. Speech by Mario Draghi, President of the European Central Bank at the Global Investment Conference in London, 26 July 2012. <https://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html>.
- Eichengreen, B. 1996. *Globalizing capital: A history of the International Monetary System*. Princeton, NJ: Princeton University Press.
- Galbraith, John Kenneth. 2014. "Morality and hard times." By Anantha Nageswaran, in Economic and Public Policy, March 25, 2014. <https://thegoldstandardsite.wordpress.com/tag/john-kenneth-galbraith/>.
- Kindleberger, C.P. & Aliber, R.Z. 2011. *Manias, panics and crashes: A history of financial crises*. New York: Palgrave Macmillan.
- Krugman, P.R. & Obstfeld, M. 1977. *International economics: Theory and policy*. Boston, MA: Pearson.
- Kydland, F.E. & Prescott, E.C. 1977. "Rules rather than discretion: The inconsistency of optimal plans." *Journal of Political Economy* 85(3): 473-492.
- Minsky, H. 1995. "Financial factors in the economics of capitalism." *Journal of Financial Services Research* 9: 197-208.
- Mittnik, St. & Semmler, W. 2014. *Overleveraging, financial fragility and the banking-macro link: Theory and empirical evidence*. ZEW Discussion Papers, 14-110, ZEW-Leibnitz Centre for European Economic Research.
- Mundell, R.A. 1961. "A theory of optimum currency areas." *American Economic Review* 51(4): 657-665.
- Roch, F. & Uhlig, H. 2018. "The dynamics of sovereign debt crises and bailouts." *Journal of International Economics* 114: 1-13.
- Semmler, W. 2019. *International Finance class notes*. New York: The New School for Social Research.
- Semmler, W. & Proaño, Ch.R. 2015. *Escape routes from sovereign default risk in the euro area*. ZEW Discussion Papers, 15-020.
- Schleer, F. & Semmler, W. 2014. "Financial sector and output dynamics in the Euro area: Non-linearities reconsidered." Schwartz Center for Economic Policy Analysis working paper 2014-5. www.economicpolicyresearch.org/images/docs/research/financial_crisis/SCEPA_Working_Paper_2014-5.pdf
- Stein, J.L. 2011. *The diversity of debt crises in Europe*. Working Paper 348, CESIFO. Category 6: Fiscal Policy; Macroeconomics and Growth.
- Stein, J.L. 2012. *Stochastic optimal control and the US financial crisis*. New York: Springer.
- Yang, X. 2019. *International Finance class notes*. New York: The New School for Social Research.