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Will the US Dollar Remain the Sole Key
Global Reserve Currency in the Future?
The Implications of Rising Debt,
Unorthodox Monetary Policy and
Emergence of Alternative Currencies.

Brenden Merrill

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Abstract

This thesis studies two key risks that have the potential to dethrone the US dollar's position as the dominant global reserve currency. Specifically, it contends the first risk stems from a future loss of confidence in the US dollar's value from excessive indebtedness and unintended consequences from the implementation of unorthodox monetary policies. The second risk could come from other major states circumnavigating the US dollar by utilising and facilitating the rise of other reserve currencies. To examine these two risks, an interpretive methodological approach is utilised to study a wide variety of relevant qualitative and quantitative data. Based upon this, the thesis seeks to answer the following question: will the US dollar remain the sole key global reserve currency in the future? It finds that the US dollar is in danger of being dethroned and is unlikely to retain its position as the sole key global reserve currency. Yet, if managed properly by elected leaders, excessive indebtedness will not significantly affect the US dollar's status. However, the rise of other currencies, most notably the Chinese Yuan and the inherent potential of new gold backed and cyber backed currencies, is a risk that cannot be completely mitigated. Therefore, in the future, the US dollar will likely lose its monopoly as the key reserve currency and have to be content with the US dollar being the first or second most important currency in a duplicity/multiplicity key reserve currency world.

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Introduction

According to Investopedia (2017), a reserve currency is a “currency held by central banks and other major financial institutions as a means to pay off international debt obligations, or to influence their domestic exchange rate.” In effect, it is the global currency that nations use to trade with one another. Since 1944, the US dollar has been the sole key global reserve currency. In addition to the United States’ (US) economy being globally the biggest by a large margin, what has helped the US dollar remain as the key reserve currency is that virtually all main commodities, such as oil, natural gas, gold, etc., are traded globally in US dollars. Before the 2008 Global Financial Crisis (GFC), it was almost inconceivable to think that the US dollar’s role as the key global reserve currency was in any risk of being dethroned. This was due to the fact, that at the beginning of 2008, US dollars made up 64% of all global reserves (IMF, 2017).

More importantly, there was no other alternative that had any credibility in challenging the US dollar as the key global reserve currency. The euro, yen and pound, while very important supporting reserve currencies, were just too small to challenge the US dollar’s role of being the sole key dominant reserve currency. While a large currency, the Chinese yuan, in 2008, was in no position to rival even the euro, pound or yen. This is because the Chinese financial system and economy was, and still is, relatively closed. Finally, at the time of the financial crisis, gold was on the whole seen as a relic and cyber currencies did not exist. As a result, virtually all market commentators believed the US dollar’s role as the sole key reserve currency was going to remain unchallenged for the foreseeable future.

However, in the aftermath of the GFC, there was some emerging signs that some world leaders have grown tired of the US dollar’s role as the key global reserve currency. In a March 2009 essay, written by the head of the Chinese Central Bank Governor. Zhou Xiaochuan, which came as a surprise to the West, outlined that due to the “inherent vulnerabilities and systemic risks in the existing international monetary system, the creation of a single currency made up of a basket of global currencies controlled by the IMF would help achieve the objective of safeguarding global economic and financial stability.” (China Daily, 2009, Para.1). With regard to Russia, their leader, Vladimir Putin, arguably the biggest critic of the US dollar, has had plenty to say on the matter. In one case, in August 2011, he was quoted as saying the US dollar is a “parasite” on the global economy and that there should be other reserve currencies (Reuters, 2011). Chinese and Russians officials would go on to make similar statements between 2011 and 2017.

Although Russia and China are the two biggest challengers to the current global economic system, other prominent nations, such as Iran, Brazil and India, have also questioned the current international currency structure. The reason why these nations are dissatisfied is because the US has an unfair advantage in their view as it is cheaper for the US government to borrow, it's cheaper to purchase foreign goods and there is reduced exchange rate risk. While these nations are dissatisfied with the current economic order, the US will make it as hard as possible for these nations to circumnavigate the use of the US dollar when trading globally because of the advantages it has for the US. While the US will have to be aware of some nations trying to circumnavigate the US dollar, another major challenge and disruption to the US dollar's role as the sole key reserve currency is their own economic instability from excessive levels of indebtedness. If confidence is lost in the ability for the US government to pay its debt, confidence in the underlining value of the US dollar will also be lost. Therefore the growing levels of sovereign debt should not be ignored.

In the wake of the GFC, the US, as well as other key global economies, have amassed a considerable amount of sovereign debt. This was required to stimulate their economies out of the worst downturn since the great depression. As well as this large build up in debt, unorthodox monetary easing policies have been implemented from the US Federal Reserve (Fed) as well as from other key central banks globally. In addition to these unorthodox monetary policies stimulating their economies, they have also had the intended effect of lowering the costs for governments to service their debt. However, long term, when interest rates start to normalise, it is going to be increasingly harder for nations to meet their debt obligation while also paying for the traditional services governments provide.

As a result, there are two key significant risks that could potentially challenge the US dollar's position of being the sole key reserve currency. The first risk being lost confidence in the US dollar's value from excessive indebtedness and unintended consequences from unorthodox monetary policies. The second risk being other countries circumnavigating the use of the US dollar through the potential rise of other reserve currencies. Therefore, with regard to the key research question for this thesis, it will be the following, **Will the US dollar remain the sole key global reserve currency in the future?**

While this thesis is predominantly focused on the US sovereign debt situation and its post GFC monetary policies, six other key economies will also be briefly studied. These include the economies of Japan, Germany, United Kingdom, France, Italy and Spain who are the third,

fourth, fifth, sixth, eighth and fourteenth biggest global economies, respectively. As you can see from Figure 1, as of 2016, these six countries plus the US, are responsible for 46.8% of the world's economy (IMF, 2017). It is important to briefly study these six nations, as like the GFC showed, the world is increasingly global and interconnected financially. Furthermore, these six countries are all first world nations who have also seen similar accumulations of debt and similar unorthodox policies implemented, like the US has, in the post GFC era. As a result, as will be discussed in this thesis, sovereign debt problems with these nations potentially become economic problems for the US and the US dollar in this increasingly interconnected world if confidence in the US debt is also placed in question due to a domino effect.

It is central to note, excluding China, who makes up 14.9% of the world's economy, from the list of seven countries is a notable country to not include. However, there is rationale behind this. Compared to the other seven countries, China's economy and financial system is noticeably far more closed as was mentioned. Plus, being quasi-communist, with a very large percentage of their economy being comprised of state owned enterprise assets, their economy operates remarkably different from first world open democratic nations. Additionally, due to their debt and monetary policy dynamics being sizeably different, China will not be a main country studied in this thesis. The above is not to suggest that China cannot substantially impact the world economy and global financial markets. Therefore, while China's debt and monetary policy situation will not be studied in this thesis, China's economic rise and the yuan's future in the world's economy as a potential reserve currency will be studied in the last chapter.

In conclusion, this thesis will argue that the evidence it has examined shows that there are two key risks threatening the US dollar's ability to remain the sole key reserve currency globally in the future. These two risks being lost confidence in the value of the US dollar due to excessive indebtedness in conjunction with unorthodox monetary policy and the risk of the potential rise of other reserve currencies that could challenge the US dollar. As these risks have a wide variety of factors and dynamics to consider, determining to what extent these risks will have on the US dollar's ability to remain the sole key reserve currency will be central to this thesis.

Methodology

The primary research question of this thesis is: ‘Will the US dollar remain the sole key global reserve currency in the future?’ The reason why this research question does not place a date on the event, for example in 20 years, is because there are inherent problems formulating a research question that involves looking into the future. For example, if you only look at 20 years, you have to justify why you did not look at 30 years. Additionally, events that are predicted to happen in 20 years could transpire in five years. Finally, as qualitative data is more valuable in addressing this research question, it is hard to extrapolate with any certainty based off data. This thesis is not intended to precisely predict a date when the US dollar as a key reserve currency may potentially decline in importance, as it is an event that will not happen overnight. What the thesis is attempting to do is focus on how the two key risks over time will impact the US dollar as the sole key reserve currency. Therefore the research question is intended to look into the broad future instead of a specific timeframe, as it is very difficult to place a specific date on the event.

It is impossible to provide a definitive answer to this question. The saying that ‘if you have five economists you will get six opinions’ captures the essence of this point. This is because there are far too many variables and unforeseen events that will influence the future role of the US dollar globally. As such, to answer the primary research question of this thesis, interpretive research is the chosen research paradigm due to the inherent subjective aspect of making projections into the future. Interpretive research is a method of research used when there is no simple ‘yes or no’ answer or where multiple conclusions can be drawn from studying the same sources of information and evidence. Therefore interpretive research is best geared towards formulating and discovering, through the use of qualitative research, what an involving process or phenomenon means within a wider context. Effectively, by analysing and interpreting the qualitative data, a degree of understanding and educated conclusions can be drawn and the evidence and analysis throughout this thesis provides a firm footing to attempt this.

While there are a variety of different risks and threats that can impact the future role of the US dollar as the sole key reserve currency, an educated assessment and conclusion for this research question can be formulated by studying the two significant risks that were highlighted in the introduction. These risks are currently highly relevant and vital to understanding the evolving phenomenon.

Chapter Outline

Before the two risks mentioned are studied, a literature review will be conducted to highlight and explore potential literature gaps surrounding these two key risks. This will be done in order for this thesis to provide a unique perspective that will add to the literature in this field. Following this, Chapter 1 will provide a historical perspective on the evolution of reserve currencies over the last 500 years and the rise of the US dollar to its current position as the sole key reserve currency. This provides essential context and a foundation to understand the scope of this topic. Once this is studied, the rest of the thesis will focus on the two key risks facing the US dollar.

With regard to studying the first risk of excessive sovereign debt, Chapters 2–5 will address this. In order to address this risk, it is important to have a theoretical lens of analysis in order to understand the risk of excessive indebtedness. For this thesis, the main theory that will be used is the Debt Super Cycle Theory, which will be covered in Chapter 2 along with other supporting theories. The Debt Super Cycle Theory does not state a specific level of debt that is considered excessive or a level of debt that would be deemed too risky. However, what the theory does explain is that there are four ways in which a government can deal with excessive indebtedness. These include grow your way out of the debt, implement austerity measures, inflate the debt away and finally default on the debt. This theoretical framework is used to examine America's sovereign indebtedness and its impact on the US dollar's value and hence its ability to function as a reserve currency.

Once the economic theory is covered in Chapter 2, Chapter 3 will address the actual state and level of sovereign debt in the US. Additionally, the sovereign debt position of Japan, Germany, France, United Kingdom, Italy and Spain will also be explored. Following Chapter 3, the role unorthodox monetary policy has played in generating economic growth and in decreasing the cost of borrowing for the US government, as well as the six other nations, will be studied. Once both Chapters 3 and 4 have been explored, Chapter 5 will combine the theory outlined in Chapter 2 with the findings in Chapters 3 and 4. Specifically, Chapter 5 will have to cover two key points. Firstly, an analysis why, in an increasingly interconnected global economy, sovereign debt problems and unorthodox monetary policy in other key nations can have impacts on the US economy and hence the US dollar.

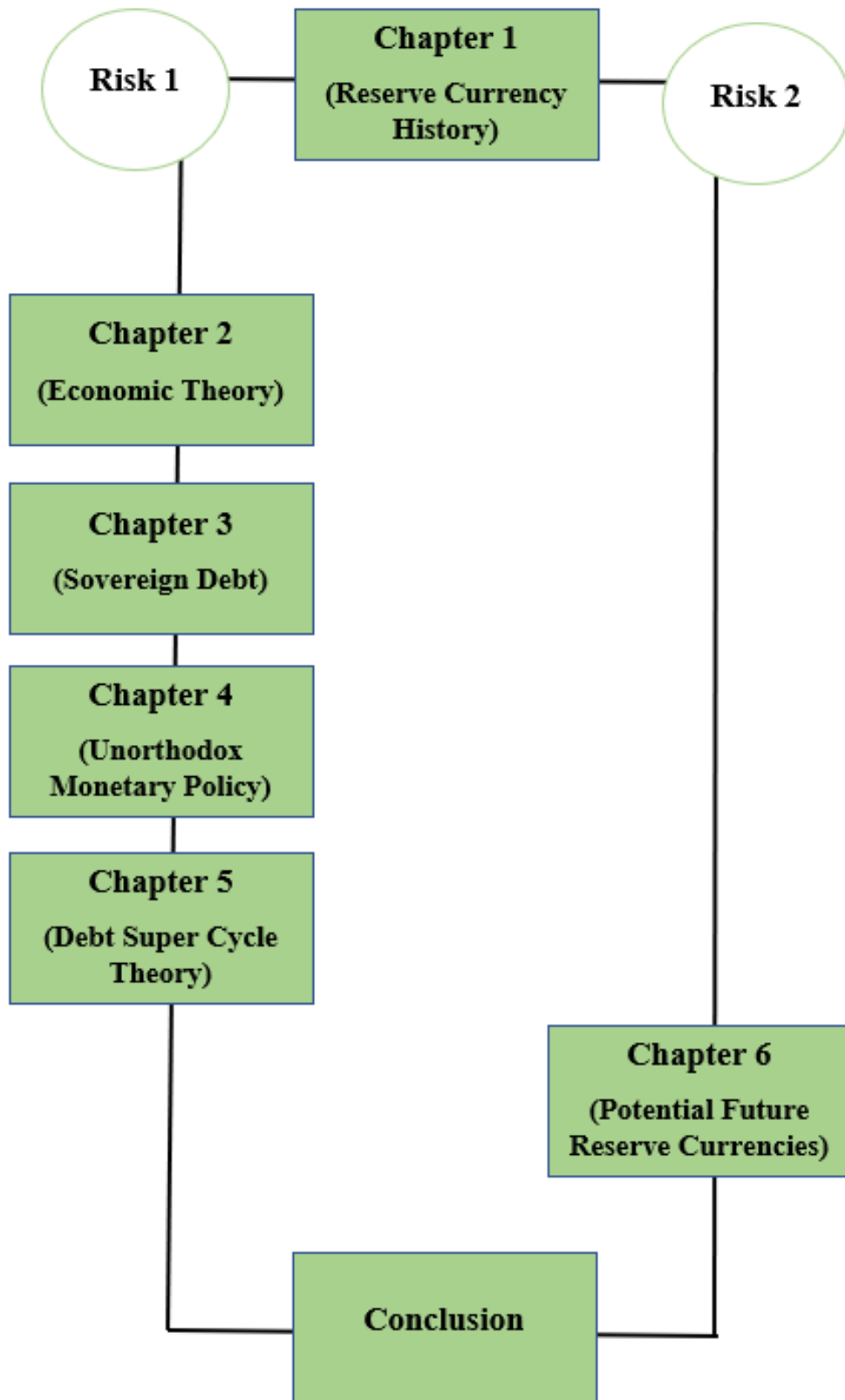
This is why this thesis also studies the sovereign debt position and unorthodox monetary policies of the key global economies of Japan, Germany, United Kingdom, France Italy and

Spain. Secondly, this chapter will explore all four debt reduction paths the US government may face in the future as outlined by the Debt Super Cycle Theory. In addition to trying to determine which of the four options are more likely to be implemented compared to the others, an analysis on the impact each path would have on the US dollar's future role as the sole key reserve currency will be discussed to gauge just how large of a threat sovereign indebtedness could be for the US dollar. Once this is discussed, this thesis will focus on the second risk facing the US dollar's future role as the sole key reserve currency.

With regard to the second risk, while only one chapter is required to adequately address it, it does not mean it is less important or less relevant in addressing the research question. As such, Chapter 6 will explore the potential rise of other currencies such as the Chinese yuan, Russia ruble the euro, etc. Additionally, as part of this chapter, a variety of different forms of currencies, other than the common fiat currency, will be discussed. As part of this analysis, the merits, pitfalls and viability of these different types of currencies will be studied. Finally, potentially a different form in the US dollar may provide and lead to increased confidence in its underlining value. Therefore it's important to study and interpret the viability of the US government doing this. Potentially, by transforming the US dollar away from being fiat in nature, the US government could restore faith in the US dollar's value, and hence ensure it remains the sole key reserve currency if a sovereign debt crisis does transpire in the future.

Finally, after both risks to the US dollar's future are studied, an answer to the research question will be delivered in the form of a conclusion. While both risks to the US dollar are different, they are inherently interconnected. This is because a loss in confidence in the US dollar's value due to excessive indebtedness means that another currency will have to rise to take its place. This is particularly true when there are nations such as China and Russia who, given the opportunity, would like their currencies to play a greater role globally. Additionally, if another reserve currency is to rise in the future it will have to challenge the US economically, and it is hard to see how this challenge will be successful if the US does not experience a sovereign debt crisis. Therefore, as both risks are interconnected, a conclusion will answer the question of whether the US dollar remains the sole key global reserve currency in the future based on the extent of the combined risks.

Chapter Outline Flow Chart



Data Sources

Lastly, with regard to chosen data sources, a wide variety of qualitative secondary sources will be used. These include academic journal articles, non-fiction books by academics and professionals working in the fields of economics and finance and a wide variety of accredited and reputable newspapers, such as the Financial Times, The New York Times, CNBC, Bloomberg, etc. Additionally, in a supporting role to the qualitative information, quantitative data will be used to highlight and reinforce the qualitative information. For example, time series data on economic growth rates, inflation rates, debt-to-GDP ratios etc., will be of importance to incorporate within this thesis in order to appropriately address the research question. Databank sources will be used for this qualitative information and will include sources from the International Monetary Fund (IMF), The World Bank, The Federal Reserve Economic Databank (FRED), OECD etc.

Literature Review

The decline of the US dollar as a key reserve currency is a subject that is widely explored and examined within the academic literature. While the literature discusses a variety of different reasons as to why the US dollar role as the key reserve currency will decline, there are two commonly cited reasons in the literature. These include the rise of other currencies, such as the euro or yuan, and excessive indebtedness of the US government that could lead to lost confidence in the US dollar's value. Therefore this literature review will focus on both reasons and where applicable highlight areas where there are gaps in understanding in the academic literature.

Rise of Other Currencies

A commonly cited currency that academics have argued could replace the US dollar as a reserve currency is the euro. Founded in 1999, academics such as Spiegel, (2005); Chinn and Frankel, (2005) and Papaioannou, Portes, and Siourounis (2006), pre GFC, all felt that the euro was going to reach parity with the US dollar. Chinn et al. (2005) even went farther and reasoned it would surpass the US dollar. However, these academics felt this would be the case for a variety of different reasons. Spiegel (2005) discussed that over time countries will want to hedge the US dollar more, so in the future the euro provides an ideal hedge for many nations. Papaioannou et al. (2006) believed that the petrodollar would weaken the advantage of the euro. Finally, Chinn et al. (2005) argued that the eurozone economically over the long term will surpass the US economy.

However, academic literature after the GFC argues that the euro currency is not in a position to become the key global reserve currency (Costiganm, Cottle, & Keys, 2017; Carbaugh, 2011). The viewpoint of Costiganm et al. (2017) is that the sovereign debt crisis and the threat of the nations of Portugal, Ireland, Italy, Greece and Spain (PIIGS) make the US dollar still the key reserve currency of choice. Both Costiganm et al. (2017) and Carbaugh (2011) contended that until the eurozone is a fiscal union and not just a monetary union, the euro will not be able to challenge the US dollar. Costiganm et al. (2017) added to this point by saying it is not going to happen as the Germans and the Greeks are diametrically opposed financially and could never agree on how a fiscal union would look. From a different point of view Gupta and Goyal (2014) argue that the eurozone economically is stagnating and for the foreseeable future is going to be growing at a slower rate than the US economy. Finally, Mastanduno (2009) claims that the US dollar will remain king as it is still seen as the ultimate safe haven currency. Evidence for this

is that despite the GFC originating in the US the US dollar appreciated rapidly (Mastanduno, 2009).

While the majority of post GFC literature on the euro's future as the key reserve currency is not favourable, there are some academic literature that is still bullish on the euro's future. Morgan (2009), Bulkot (2013), and Jayakumar and Weiss (2011) all argued that as the US dollar weakens in the future, the future will be a world where there are multiple reserve currencies with the euro being one of them. From a different point of view, Galati and Wooldridge (2009) argue that European countries will want to do more trade with euros, particularly when purchasing energy from overseas. On the whole, besides these three academic sources, there is little literature that is pro euro as a reserve currency in the post GFC era.

Another widely cited currency in the academic literature that could surpass the US dollar as the key reserve currency in the future is the Chinese yuan. Compared to the post GFC era, academic literature prior to GFC about the Chinese yuan rising to reserve currency status is not as extensive. However, Wilson (2007) and Matsat, (2006) do discuss the possibility all by arguing a different point. Wilson (2007) said that one day China will be as powerful, economically, as the US. It is because of this that Wilson (2007) argues that it is logical China will want to have the yuan to rival the US globally. Matsat (2006), on the other hand, reasons that as China continues to be the world's factory into the future, they will want to trade more in yuan in order to save on currency transaction costs.

In the post GFC era there is more on the subject. Mallaby and Wethington (2012), Yeh (2012) and Lee (2014) agree with Wilson (2007) in that a stronger Chinese economy on par with the US will one day lead to the yuan being a reserve currency. Wang, Huang, and Fan (2015) add that China's One Belt One Road initiative will continue to economically integrate countries towards China. The point being that the Chinese yuan will become more widely used globally the more China integrates with countries (Wang et al., 2015). From a different point of view, Bhat (2013) and Prasad (2013) argue that the yuan will be a reserve currency in the future because of the weakness and long-term demise of the US dollar due to the aftermath of the GFC. Where Bhat (2013) and Prasad (2013) disagree is that Prasad (2013) felt the yuan will one day fully replace the US dollar, whereas Bhat (2013) felt the yuan and US dollar would both share the role of being reserve currencies.

While there are many academic sources that believe the yuan can challenge the US dollar long-term, there is also a large body of research that argues differently. Lee (2014), Gao and Coffman (2013) and Chong (2013) all argue that the Chinese economy needs to continue to open up before the yuan can be considered a reserve currency. Lee (2014) and Gao and Coffman (2013) both contend that the yuan is to be unpegged before this happens, whereas Chong (2013) claims that China needs to have an open debt market to international investors. Chinn (2015) reasoned that while the yuan could be a reserve currency with close neighbours, it is unlikely to be able to dethrone the US dollar with America's close allies as long as the US economy remains strong. Lai (2015) and Chanda (2013) from a different point of view cited that China has reached its peak growth rate and is going to economically stagnate in the future. Lai (2015) argued China could face a Japanese style decline whereas Chanda (2013) cited demographic problems that will hamper China's ambition for the yuan to act as a reserve currency. Finally, Brooks & Wohlforth, (2016) and Shimazu (2015) say that the US economy will remain strong long-term which will prevent the yuan from fully replacing the US dollar.

Although not as widely cited as the euro and the yuan, there is academic literature by Eichengreen (2012), Pop (2016) and Dailami and Masson, (2010) that discusses the future of a gold standard. All three journal articles though a gold standard would mitigate the impacts of lost confidence in fiat currencies.. Where they disagree is that Eichengreen (2012) and Pop (2016) felt a gold standard like the Bretton Woods agreement would be ideal, whereas Dailami et al. (2010) felt that a gold standard like what was commonplace globally in the second half of the 19th century would be the best. Differently from the three, Jordan (2015) felt that a world currency that was backed by a combination of gold and other commodities, such as silver and platinum, would be the best.

Another potential future reserve currency mentioned is the IMF Special Drawing Right (SDR). Chey (2012) and Costiganm et al. (2017) felt that the (SDR) currency would be a viable currency in the future in the event of another GFC. Chey (2012) felt that it could fully replace the US dollar, whereas Costiganm et al. (2017) argued it could be used temporarily to allow governments to renegotiate a new economic order. Finally, the last currency to mention is cyber currencies. While there is a sizeable amount of literature about the future of cyber currencies, what is missing from the academic literature is an understanding about the potential of cyber currencies acting as reserve currencies in the future. While not the same thing, Costiganm et al. (2017) and Pop (2016) both argue that all currencies will eventually go cashless and 100% digital, which would also include the US dollar as a reserve currency. However, a digital

currency is different from a cyber currency, so again there is a gap in the literature on this subject.

Lastly, the other major apparent gap in the literature is the combination of other currencies with different forms of currencies. For example, literature discussing how the Chinese could back the yuan by gold to dethrone the US dollar do not appear to exist. Any academic literature on how cybercurrencies could be fused with existing currencies today also are not found. As a result, this is an important area to study as these are real possibilities that could transpire in the future.

Excessive Indebtedness

A different branch of academic literature discusses that lost confidence in the ability of the US government to pay its debt will lead to the demise of the US dollar as a reserve currency. Keaney (2017) and Merki (2015) point to rising yields and lower value of US bonds will lead to nations converting their reserves into euros, yen and pounds. Pop (2016) disagrees with Keaney (2017) and Merki (2015) by arguing that all fiat currencies will be at risk and hence governments will rush to convert their reserves into intrinsically valued goods, such as gold, oil and other commodities. Eichengreen (2012) also had this viewpoint but only cited gold as being the new reserve currency of choice in the aftermath of a collapse in the bond market.

Sharma (2011) and Prasad (2010) argue that the problem in the future of excessive indebtedness could be caused if foreign nations dump the US debt as a form of economic warfare. The likely source of this according to Prasad (2010) would be China who is the foreign government who owns the most US debt. While not cited as a form of economic warfare, Carbaugh and Hedrick (2008) and Jordan, (2015) also acknowledge that there is the risk of foreign nations selling US debt. Carbaugh et al. (2008) argued that this could happen because of a run on confidence in the value of US debt whereas Jordan (2015) discussed how this could happen if foreign nations felt there is a risk of being defaulted on through inflation. Both are effectively the same point with the exception that Jordan (2015) explicitly points to inflation being the risk factor.

From a different point view of view, Kovačević (2014) and Greenspan (1999) argue excessive indebtedness will only be a problem to the US dollar if it is not clear how it will be paid for. Effectively, as long as markets believe the US government can pay its debt then the US dollar is not at risk of losing its reserve currency status (Greenspan, 1999). However, Bergsten (2009)

and Cox (2012) disagree and contend that confidence can be lost for a variety of reasons. Bergsten (2009) discussed how lost confidence in the US dollar can be due to new economic policy announcements, whereas Cox (2012) argues it's impossible to know or predict why markets can lose confidence in the value of sovereign debt.

With the above said, it is also important to study the commonly cited concept known as the Triffin Paradox. This paradox states that in order for a reserve currency to exist the home country has to be willing to run budget deficits to allow foreign nations to have reserves to invest in (D'arista, 2004). However, running budget deficits indefinitely place stress on confidence of the reserve currency; hence the paradox between short-term domestic and long-term international objectives. Bordo and McCauley (2016), Sharma (2011) and Cox (2012) cite the Triffin Paradox as the reason why debt levels in the post GFC era will eventually undermine the US dollar's reserve currency status. However, other academics, such as Carbaugh (2011) and Heldring (1988), believe the Triffin Paradox is a not relevant. Carbaugh (2011) discusses how other liquid assets other than debt can be used as reserves. Whereas Heldring (1988) argued that the US government could run budget surpluses and still allow foreigners to own US debt at similar levels by having domestic owners of US debt decrease their holdings.

While there is a clear body of literature pointing to the negative implications of US debt with regard to the US dollar, there are other academics who argue that the sovereign debt problem is not a major concern for the US dollar and its role as the key reserve currency (Gupta, et al. 2014; Pop, 2016; Kristijan & Dejan, 2016). Gupta et al. (2014) cited Japan's sovereign debt levels as reasons why the US government will be able to borrow far more into the future. From a different point of view, Pop (2016) argues that the US dollar could be placed back on a gold standard which would restore confidence. Finally, Kristijan et al. (2016) discussed that as all other major currencies globally have sovereign debt problems, it does not matter as there are no other alternatives.

There is not a shortage of literature that studies the impact of unorthodox monetary policy and sovereign debt. However, other than Mitry and Matula (2012), who discuss zero interest rates, and Kovačević (2014), who discusses Quantitative Easing, both with respect to how both can restore confidence in the US dollar, there is very little academic literature discussing the interconnectedness of unorthodox monetary policy, sovereign debt and the US dollar as the key reserve currency. Consequently, this thesis will attempt to advance the knowledge the role

unorthodox monetary policy impacts on the role of the US dollar as a reserve currency in effort to add to the academic literature.

Conclusion

In concluding the literature review, there is a deep and diverse body of academic literature that pertains to how the rise of other currencies as well as how sovereign indebtedness could lead to the demise of the US dollar as the key reserve currency. While there is a deep level of understanding among academics in these two research areas, there are still gaps in the literature. Specifically, two key gaps in the literature were discovered. The first is that there is very little written about how a fiat currency like the yuan could be transformed into a different form of currency to undermine the US dollar. The second is that very little has been written that highlights the interconnectedness of unorthodox monetary policy, sovereign debt and the ability of the US dollar to remain a reserve currency. Therefore this thesis will attempt to advance and add an understanding to the academic literature in these two areas of limited understanding.

Chapter 1: The Evolution of Global Reserve Currencies

Introduction

The key objective of this chapter is to study the economic history and evolution of the global reserve currency. Throughout history, if a Central Bank for a country was non-existent, the government would hold the foreign reserves (Investopedia, 2017). Over the last 500 years, various nations at different stages have had the privilege of having their currency act as the global reserve currency. Each country that has had their currency as the global reserve currency will be studied. Specifically, the key factors that enabled them to be a reserve currency, as well as why they lost this position will be discussed. The countries that will be studied, in order, are Spain, Netherlands, France, Great Britain and the US. Finally, the last section of this chapter will discuss why the US dollar today is the sole key reserve currency based on key economic metrics.

The main intention of this chapter is to show that reserve currencies rise and fall for various reasons. Subsequently, while the US dollar currently is the undisputed sole key global reserve currency, history shows it may not always stay the undisputed sole key global reserve currency. This is a very important point to get across as the US government cannot be complacent in believing the US dollar will remain the sole key global reserve currency forever. Reasons for this will be discussed in detail in Chapters 3–6.

Spanish Silver

Although global trade transpired before 1500AD, mainly through the Silk Road, it was the development of ocean-going Galleons during this time that allowed world trade to grow rapidly in size (Graeber, 2014). It was during this time that Christopher Columbus of Spain discovered the America's in 1492, Vasco Da Gama of Portugal who in 1498 first reached India through the southern route around the horn of Africa, and Rodrigo de Bastidas of Spain who discovered Panama and subsequently South America in 1501 (History, 1991). Consequently, with world trade increasing in volume, the need for a commonly accepted means of exchange was needed.

What turned out to fill this void was Spanish silver. Spain, with their good fortunes over the first half of the 16th century, found an immense amount of silver in their South American territory (Graeber, 2014). So much silver, and to a smaller degree gold, was found in South America that Spain gained the majority control of global precious metals (Weatherford, 2009). With silver being sent back to Seville, Spain by the tonnes, the minting of Spanish silver coins

transpired on a large-scale (Weatherford, 2009). As so many newly minted coins were created, the Spaniards were then able to trade with other civilisations globally in silver as opposed to bartering which previously was common place (Graeber, 2014). As silver does not degrade, other civilizations that accepted Spanish silver could then in turn use their silver to trade with other civilizations for goods (Weatherford, 2009). As a result, around the mid-16th century was the birth of the first global reserve currency (Weatherford, 2009).

However, the Spanish silver coin as the global reserve currency eventually faded over time due to a number of factors. Firstly, due to so much silver being brought back to Spain, the value of silver eventually fell by around two-thirds (Weatherford, 2009). This consequently led to rapid appreciation in prices of goods in terms of silver that ultimately led to what is known as the 'Price Revolution' (Graeber, 2014). During this time between 1540 and 1640, prices of goods throughout Europe rose by a factor of approximately 6–8 times (Graeber, 2014). What the Spanish failed to understand was the value of precious metal is not absolute. The Spanish ultimately learnt that increasing the money supply faster than the rate of economic growth, all else equal, leads to price inflation (Graeber, 2014). Despite this inflationary period, world trade and economic growth dramatically increased (Graeber, 2014).

Secondly, the Spanish Empire ultimately declined (Weatherford, 2009). This was largely due to the 40 plus wars that the Spanish fought in the 16th and early 17th century which, ultimately, left them bankrupt eight times in the years of 1557, 1560, 1575, 1596, 1607, 1627, 1647, 1652, and 1662 (Ferguson, 2009). Additionally, Spain fell in the trap of the resource curse where they failed to diversify their economy adequately enough from just mining precious metals (Graeber, 2014). Finally, as so much silver was leaving Spain and not returning in the forms of export receipts, a lot of the silver, especially in places like China, was melted down and re-casted into new silver coins (Graeber, 2014). All of these reasons led to the fall of the Spanish silver coin as the global reserve currency. With the decline in the use of Spanish silver, the door was open for the rise of the Dutch guilder.

Dutch Guilder

The Dutch guilder did not become the global reserve currency overnight. Instead, it was due to a number of factors. These include the establishment of the first Central Bank in 1609, the rise of the Dutch East Trading Company and the signing of the Treaty of Westphalia in 1648, which marked the end of both the Eighty Years' War between the Spanish and the Dutch and the

Thirty-year religious war between the Catholics and Protestants (Ferguson, 2009; Weatherford, 2009).

The first Central Bank in the world was established in Amsterdam in 1609 and was formally called the Amsterdam Exchange Bank (Historyworld, 2001). Its key purpose was to solve the practical problems merchants faced, with as many as 14 different currencies circulating among the different provinces (Weatherford, 2009). The Amsterdam Exchange Bank originally accepted all the different currencies and then eventually standardised them into one common currency known as the Dutch guilder (Ferguson, 2009). In effect, The Amsterdam Exchange Bank pioneered the system of cheque and direct debit transfers that we use today in modern banking (Ferguson, 2009). The Amsterdam Exchange Bank, in addition to precious metals, also handed out bank notes (Weatherford, 2009). These bank notes were almost 100% backed by precious metal reserves until as late as 1760 (Weatherford, 2009). This made a run on the bank virtually impossible and is largely responsible for the price stability and strong growth during what is known as the Dutch Golden Age.

The second factor that played a major role in the Dutch guilder becoming the global reserve currency was the establishment of the United East India Company in 1602; the first publicly traded company globally (Foucheéa, 1936). During this time, it was a very risky prospect sending ships to the East Indies in search of spices, mainly due to the risk of attack from the Spanish and Portuguese (Foucheéa, 1936). Of the 22 ships that set sail in 1598, only 12 returned safely (Ferguson, 2009). In order to improve the profitability, and hence lower the risk for the six trading companies of the day, it made sense to combine forces, grow larger and spread risk (Foucheéa, 1936). Hence the Dutch State General, the parliament of the united provinces, proposed the six East Indies trading companies of the day join forces to form the company to be known as the United East India Company (Foucheéa, 1936).

In order to grow the size of the company even quicker, it was proposed to raise capital from the citizens who would be compensated in the future from the profits obtained from selling spices i.e. a dividend payment (Foucheéa, 1936). In total, 6.45 million Dutch guilders were raised (Ferguson, 2009). Compared to the English rival East India Company, privately owned and founded two years prior, its value was approximately 820,000 guilders, making the United East India Company by far the biggest in the world (Ferguson, 2009).

Between 1603 and 1607, 22 ships set sail to Asia with the main intention of establishing trading posts and factories (Ferguson, 2009). With more ships being sent and, crucially, more coming

back with spices, the value and profitability of the United East India Company grew (Foucheéa, 1936). The first dividends were paid in 1611, followed by 1612, 1613 and in 1618 (Ferguson, 2009). Over time, thanks in large part to the development of the Amsterdam Exchange Bank, a stock exchange formed for trading shares in United East India Company in a secondary market (Ferguson, 2009). This was the birth of the first stock market in the world (Ferguson, 2009).

Throughout the 1630s and 1640s the United East India Company became extremely successful as it continued to expand its presence in the Southeast Asian region as well as continuing to bring ever larger quantities of spices back to Europe (Foucheéa, 1936). By 1650 they effectively had a monopoly on cloves, mace and nutmeg coming back to Europe (Ferguson, 2009). In addition, they acted as a trade hub for Asian trade between India, China and Japan, making them more profits in return (Foucheéa, 1936). The last major factor that contributed to the rise of the Dutch guilder was the conclusion of two devastating and costly wars, which ushered in a new, prosperous era for the Dutch (Ferguson, 2009).

The Eighty Years' War was fought against Spain from 1568 to 1648 over the 17 Dutch Republic provinces wanting independence from the Spanish Empire in order to avoid the crippling high taxes the Spanish imposed (Kissinger, 2015). The war was fought off and on over the 80 years making it one of the longest wars in European history (Kissinger, 2015). During the later stages of this war, the entire continent of Europe was fighting itself on the basis as to whether a nation wanted to be catholic or protestant (Kissinger, 2015). Known as the Thirty Years' War, which started in 1618, this war is regarded as one of the bloodiest in European history, where over a third of the continent were killed (Kissinger, 2015).

Both wars reached their conclusion with the signing of the Peace of Westphalia in 1648 (Kissinger, 2015). The signing of this treaty is regarded as the beginning of the concepts of states as we know them today. Essentially, the treaty outlined that each nation would respect other nations' right to exist and would not interfere with internal affairs within other nations (Kissinger, 2015). With this signing, the Dutch now had their own state and were free from having to worry about their right to existence (Kissinger, 2015). Having this security, as well as having the ability to focus resources away from war, only increased the Dutch's growing economic dominance globally (Ferguson, 2009).

By the 1650s the Dutch were the leading global power in trade, which subsequently brought them a huge amount of wealth and prosperity (Economic History, 2003). Additionally, the

Dutch made great advancements agriculturally, which in turn led to further prosperity, as more time and resources could be diverted and focused in other areas (Economic History, 2003). This trend in continued growth transpired for well over another century during the Dutch Golden Age (Economic History, 2003). This world trade conducted by the United East India Company was funded in Dutch guilders which, due to the size of trade as well as factoring in the safety and stability of the Dutch guilder thanks to the Bank of Amsterdam, made it the undisputed reserve currency of the time (Ferguson, 2009; Economic History, 2003). From as late as the 1760s, the Dutch were still responsible for as much as three times more of global shipping than the British (Ferguson, 2009).

However, gradually, over many decades in the first half of the 1700s, the Dutch guilder as the sole reserve currency declined (Ferguson, 2009). The guilder declined not because of the Dutch's mismanagement but because of the rise of France as a super economic power (Weatherford, 2009). Although the guilder eventually lost its position as the sole reserve currency, it remained important globally due in large part to the Dutch's continued financial dominance of the 18th century (Ferguson, 2009).

The French Livre

The French livre gained reserve currency status due to the rise of France economically, the reestablishment of a non-fiat livre and the fact that the Age of Enlightenment was centred in France (Graeber, 2014). During the 1700s there were four main superpowers in Europe. These included France, Great Britain, Prussia and Austria (Graeber, 2014). Italy and Germany were fractured states, Spain was in long-term decline thanks to prior centuries of over expansion, Russia was too isolated, and the Dutch and Scandinavian Republics lacked the population to be considered a superpower (Weatherford, 2009). What made France stand out most among the other three superpowers was its population (Weatherford, 2009). In 1700 the population of France was approximately 21 million which was the most at the time (Weatherford, 2009). Whereas the population of Great Britain, Prussia and Austria was approximately 9 million, 5 million and 3 million, respectively (Weatherford, 2009).

In addition to France's large population, France was also home to some of the most fertile farming land in all of Europe (Ferguson, 2009). These two factors, in combination with the adoption of major agricultural advancements made by the Dutch, led to massive economic growth (Graeber, 2014). Over time, France's new ability to produce large amounts of food led to a large rise in French exports (Graeber, 2014). What aided French agricultural exports was

the reestablishment of a non-fiat French livre silver coin in 1726 (Ferguson, 2009). Six years prior, the fiat French livre lost all form of value due to the South Sea Company bubble—regarded as the first stock market crash in history (Ferguson, 2009). As a result, the reestablishment of non-fiat currency made foreign nations more confident in bilateral trade with France due to the intrinsic value of the silver coin (Graeber, 2014).

Another important factor to consider in the rise of the French livre is the fact that the Age of Enlightenment was centred in France (Ferguson, 2009). The Age of Enlightenment, which spanned from 1715 with the death of King Louis XIV to 1789 with the start of the French Revolution, was a period of the intellectual movement of ideas (Weatherford, 2009). The fields of science, philosophy, politics, to the creation of economics in 1776, were all greatly advanced during this period (Ferguson, 2009). After the death of King Louis, the ideas of individual liberty and religious tolerance promoted by the people greatly contributed to France, and in particular Paris, being the centre of Europe during this revolutionary period (Weatherford, 2009). As a result, French hegemony during the 18th century greatly benefited the French economically. This made the French livre a popular currency globally which in turn made it the undisputed global reserve currency of the 18th century.

France through the 18th century continued to gain power on a relative basis compared to other European nations (Ferguson, 2009). This is despite the multiple wars the French fought over this time (Ferguson, 2009). However, the expansion of the French Empire came at the cost of rising debt for the French government (Ferguson, 2009). This, in combat with years of bad harvests, led to the French Revolution starting in 1789 and finishing in 1799 with the rise of Napoleon (Weatherford, 2009). The Napoleon Wars that transpired from 1803 to 1815 were fought between France against all other major European nations, including Russia (Ferguson, 2009). Fighting so many nations at one time left the country bankrupt, severely damaged their economy and ultimately led to the decline of the French currency, at this stage now called the French Franc, as the global reserve currency (Weatherford, 2009). The British Sterling would replace the French Franc, which coincides with the rise of the British Empire.

The British Pound in the Early 19th Century

The British pound began its transition as the sole global reserve currency around the fall of Napoleon in 1812 and the victory at Waterloo in 1815 (Ferguson, 2002). Specifically, there were three contributing factors around this time that led to this transition. Firstly, it was during this time that British inventions made in the first industrial revolution started to pay off

economically (Ferguson, 2002). Secondly, thanks to the Rothschild family's global dominance in banking, they were able to create the first global secondary bond market (Ferguson, 2009). Finally, the rise of British colonisation can also be contributed to solidifying the British pound as a reserve currency; particularly in the second half of the 19th century (Ferguson, 2002).

The first industrial revolution, which spanned from 1760 to 1830, benefited Great Britain more than any other nation (Ferguson, 2002). Most of the inventions from this time were British-made, including the power loom, the piston steam engine, the cast iron blowing cylinder, the train and many more (Ferguson, 2002). Therefore Britain had a head start in the productivity gains that transpired from these new inventions (Ferguson, 2002). These productivity gains led to large sustainable increases in population. Over the 19th century, the population increased by a factor of four, from 7.7 million to a population just under 30 million (Ferguson, 2002). This large population growth, with remarkable gains in living standards, led to Great Britain becoming immensely wealthy and the dominate superpower of the world by the 1850s (Ferguson, 2002).

The second factor that aided in the rise of sterling as a global reserve currency is the invention of a global bond market thanks to the Rothschild family (Ferguson, 2009). After making money in the textile industry, Nathan Rothschild and his four brothers started their banking business (Ferguson, 2009). Nathan was located in London, with the other four to be permanently located in Frankfurt, Paris and Amsterdam with the fourth travelling around Europe where needed (Ferguson, 2009). Their business model was taking advantage of the different prices of gold in these cities; a practice known as price arbitrage (Ferguson, 2009). Nathan Rothschild made his first vast fortune speculating on the fact that if Britain won the battle of Waterloo, the price of British bonds would rise due to a decrease in future borrowings of the British government (Ferguson, 2009). Great Brittan did indeed win the battle of Waterloo, which in turn made the Rothschild family excessively rich (Ferguson, 2009).

In the aftermath of Waterloo, the Rothschild banking empire continued to expand until it was the dominate bank in all of Europe (Ferguson, 2009). Thanks to the Rothschild's wide presence across Europe, they became the first bank to pay out sterling bonds to depositors all over Europe (Ferguson, 2009). This new type of bond came to be in 1818, making it possible for someone in Amsterdam to be paid out in sterling without having to travel to London to be paid (Ferguson, 2009). This proved to be so successful, sterling denominated bonds for French, Prussian, Russian, Austrian and Brazilian government debt were also issued, which, like the

British bonds, could be redeemed anywhere in Europe where the Rothschild's had a presence (Ferguson, 2009). It was the beginnings of the first truly global bond market. Having the majority of the bonds being denominated in sterling, plus having the sterling's intrinsic value tied to silver and gold, greatly helped establish the sterling as the dominate reserve currency of the 19th century (Ferguson, 2009). As a result, the Rothschild family indirectly played a large role in promoting the rise of the sterling.

The final aspect to consider in the rise of the sterling is the vast expansion of the colonies under the British Empire. It's important to note, British colonisation had been transpiring during the 16th, 17th and 18th century mostly in the Americas and Caribbean (Ferguson, 2002). However, during the beginning of the 19th century, particularly after the 1815 Congress of Vienna, Britain expanded its colonial reach to all four corners of the earth. South Africa, parts of India, Malaysia, Australia, New Zealand and parts of North Eastern Africa were all colonised by the 1840s (Ferguson, 2002). Eventually, by 1919, the peak of the Britain Colonial Empire and in the aftermath of World War I, Britain controlled a third of Africa, all areas of present day Pakistan, India, Bangladesh, Burma, Thailand, Papa New Guinea, Hong Kong and other various smaller islands located globally around the world (Ferguson, 2002). Without question, Britain was the global superpower of the day, controlling more foreign territory than any other great power by a large margin (Ferguson, 2002).

Having all these colonial territories was very valuable for Britain, particularly during the era of the second industrial revolution between 1870 and 1914 (Ferguson, 2002). These colonies provided the raw materials required for Great Britain to economically grow to the extent that it did during the 19th century (Ferguson, 2002). Secondly, Britain's colonies on the whole were only allowed to trade with Britain directly tariff free, whereas if permitted, colonial trade with other powers often had steep trade tariffs (Ferguson, 2002). Additionally, with most of this trade being carried out in sterling, sterling was acting as the reserve currency (Ferguson, 2009). As a result, while sterling was already a reserve currency, even before the colonisation era, the colonies cemented the sterling's status as a global reserve currency.

Ultimately, like the Roman Empire, Britain was overextended globally, particularly after World War I (Rickard, 2011). Additionally, under Winston Churchill's orders as Chancellor of the Exchequer, Britain returned the sterling to its pre-war gold peg, as he felt it was a point of honour and would place a healthy check on Britain's finances (Rickards, 2011). However, the results were devastating for the British economy, which eventually led to Great Britain being

the first major economy to enter the Great Depression (Rickards, 2011). Winston Churchill would later write this decision was one of the “greatest mistakes in his life” (Rickards, 2011).

With the Great Depression being felt globally, Britain finally broke its peg with gold in 1931, which only aided in the deterioration of trust in the sterling (Rickards, 2011). Meanwhile, the US, who was largely not impacted by World War I, was rapidly becoming an economic powerhouse during the 1920s aided partly by their isolationist stance (Rickards, 2011). While the Great Depression did indeed hurt the US economically, it ultimately did not stop its long-term economic rise and, after World War II, it was clear the British Sterling’s role as the reserve currency was over (Rickards, 2011).

The Bretton Woods Era 1944–1971

The Bretton Woods conference, formally known as the United Nations Monetary and Financial Conference, took place between the 1st and 22nd of July 1944 in the later stages of World War II (Federal Reserve History, 2013). The meeting involved 730 delegates from 44 key countries which was held in Bretton Wood, New Hampshire in the US (Federal Reserve History, 2013). From this conference a new world economic order was created. By this stage in World War II, it was becoming clear the allies would likely win (Conway, 2016). Additionally, with the exception of Pearl Harbour, the US had not been attacked on home soil and when compared to Europe, was in significantly better economic shape (Conway, 2016). As evidence of this, by this stage of the war, the US controlled two-thirds of the world’s gold supply (Rickards, 2014). Finally, the US was not going to make the same mistake they did after World War I by being isolated from the global economy (Steil, 2014). Consequently, this meeting was the beginnings of a new world order controlled by the US.

At the conclusion of the conference, it was agreed that the US Dollar would be pegged to the price of gold at \$35 dollars. With regard to other currencies, they would be pegged to the US Dollar, which indirectly also pegged them to the price of gold (Steil, 2014). Additionally, as part of the agreement, The US would convert US Dollars into gold for all investors and countries that wished to do so (Steil, 2014). Having other currencies fixed to the US dollar was of huge advantage to the US, as it gave them exchange rate predictability for the growing export powerhouse (Steil, 2014). This made the US dollar the global reserve currency and facilitated the vast majority of economic transactions.

In addition to the establishment of fixed exchange rates, the Bretton Wood Agreement also outlined the creation of the IMF, the International Bank for Reconstruction and Development (IBRD), which formally became known as The World Bank in 1995; and started the discussions for the development of the General Agreement on Tariffs and Trade (GATT), which was founded in 1948, that later became known as the World Trade Organisation in 1995 (Steil, 2014).

The IMF was established to make temporary loans and give financial advice and guidance to countries that found themselves in financial trouble (Conway, 2016). Effectively, the IMF has been able to provide the crucial role that gunboat diplomacy used to in prior centuries. Ultimately, the IMF has been an important institute for providing global economic stability internationally between nations in ways that are of benefit for the US global economic order. The World Bank was created to provide loans to developing countries to help fund important infrastructure projects, such as dams, transportation links, ports, etc. in order to help them grow economically. In total, since its 1947 inception, 12,746 loans have been made, all of which help foster American economic hegemony (World Bank, 2017).

Finally, the GATT, which was established in 1948, was set up with the purpose of promoting international trade through reducing and eliminating tariffs, quotas and other such trade barriers (Conway, 2016). With 164 member countries as of October 2017, the WTO is the largest global economic organisation in the world (Steil, 2014). Overall, this institution has been very important in promoting a free trade global economic order to American standards, which in doing so, has aided in American economic dominance (Steil, 2014). What is important to note is that all three institutions have helped improved the US's economic hegemony which, in turn, helps maintain the US dollar as the sole key reserve currency.

In saying this, these institutions did not stop the collapse of the Bretton Woods Systems. Although remarkable growth was achieved during the 1950s, the 1960s, under the Kennedy and Johnson presidencies, saw stagnant growth, rising trade and budget deficits and rising inflation largely due to President Johnson's guns and butter programme (Rickards, 2014). To fund the budget deficits, America abused their power of being the sole reserve currency by printing money to finance the Vietnam War and the social programmes back home (Conway, 2016). Nations who had a surplus of US dollars began to worry about what the future value of these US dollars would be (Steil, 2014).

Consequently, starting with France in January 1965, the French asked for \$150 million in US dollars to be converted into gold with an additional \$150 million to be converted soon after (Rickards, 2011). French President Charles De Gaulle famously offered to send the French navy to help with the gold transfer (Rickards, 2011). Soon after, Spain followed with a \$60 million dollar conversion (Rickards, 2011). Over the next few years, the nations of Switzerland, Netherlands and Italy would follow suit (Rickards, 2011).

With a run on the US dollar slowly starting to take place, the IMF in 1969 created a new currency called a Special Drawing Right (SDR) (IMF, 2016). The SDR's value was originally derived from the value of gold where one SDR was worth 0.888671 grams of gold which was worth about US\$1 (IMF, 2016). The SDR was meant to supplement the role of settling international accounts that both gold and the US dollar facilitated during this time (IMF, 2016). Thus only countries, and not individuals, could own SDR's (Rickards, 2011). The SDR system, while still currently in place today, ultimately did not replace the US dollar (Rickards, 2011).

Despite the instalment of the SDR system, there continued to be a run on the US dollar as countries continued to sell US dollars and buy US gold (Federal Reserve History, 2013). Ultimately, it was a one-sided trade that was depleting the stock of US gold (Federal Reserve History, 2013). Thus, President Richard Nixon, on August 15th, 1971, officially announced that US dollars were no longer convertible into gold (Steil, 2014). At the time, there was 8,000 tonnes of gold in US reserves, a fraction of the 20,000 tonnes a decade prior (Rickards, 2011). President Nixon's closing of the gold window, formally known as the Nixon Shock, officially marked the beginning of the end of the Bretton Woods era (Federal Reserve History, 2013).

It was not just the US dollar that now began to freely float. The British pound, French franc, German mark, Japanese yen and eventually all other major currencies would become freely floating fiat currencies (Steil, 2014). In addition to closing the gold window, President Nixon also adopted a 90-day wage and price freeze as well as a 10% import tariff to combat the growing balance of payments deficit that was largely blamed on growing Japanese and German export dominance (Rickards, 2011). This 10% import tariff had the same impact as a 10% devaluation in the US dollar. It immediately gave the US export market a desperately needed economic lifeline (Steil, 2014). Two weeks after the Nixon Shock, Japan, who were being protected militarily by the US from China and Russia, agreed to float their currency (Rickards, 2011). This resulted in an immediate one-day US dollar devaluation of 7% against the yen (Rickards, 2011).

In late September, a G10 meeting of finance ministers from the world's biggest economies met in London (Rickards, 2011). The US demanded a \$13 billion swing in the balance of trade from its current \$5 billion deficit to an \$8 billion surplus (Rickards, 2011). Until this happened the 10% import surcharge was there to stay (Rickards, 2011). Two weeks later the key members met in Washington for an annual IMF meeting (Rickards, 2014). More nations started to appreciate their currency against the dollar ranging from the 3–9% range (Rickards, 2011). This was not enough from the Americans perspective, but it did lead to the US softening its threats as the US indicated it would consider dropping the surcharge as long as the balance of payments moved in the right direction (Rickards, 2014).

In early and mid-December of 1971, the G10 finance members met in Rome and then in Washington where it was finally agreed that the US would devalue the price of the US dollar of gold by about 9% from \$35 to \$38 (Rickards, 2011). Although the US gold window was still closed, it did increase the value of foreign nations' gold holding in US dollars, as the US indicated they would maintain a peg to gold at the new \$38 level (Rickards, 2011). As for the devaluation of foreign currencies, the US dollar was devalued by 3–8% against the major G10 nations giving a total adjustment of 12–17% when including the gold devaluation (Rickards, 2011). Japan, being the strongest economy, was devalued by 17% (Rickards, 2011). With fixed exchange rates restored at a level fairer from the American's perspective, the US import surcharge was dropped (Rickards, 2011).

The short-term benefits the devaluation provided to America was short-lived. By 1973 the US was in the worst recession since the Great Depression (Steil, 2014). Additionally, the United Kingdom, also in economic turmoil, was forced to devalue the pound by 6% on June 23rd, 1972, which, by the end of the year, fell even more to 10% against the US dollar (Rickards, 2011). Immediately, speculation that the Italian lira would have to devalue emerged. Not helping matters, President Nixon was infamously quoted saying, "I don't give a shit about the lira" (Rickards, 2014). A week later West Germany enacted currency control on the 29th (Rickards, 2011). Then by July 3rd the Swiss franc and the Canadian dollar began to float (Rickards, 2011). The IMF and the US Fed quickly responded by establishing swap lines and short-term currency lending facilities with central banking globally, in order to try and stop the currency turmoil (Steil, 2014); however, the damage was done.

Post Bretton Woods 1973--Present

In the beginning of 1973, the IMF officially claimed the Bretton Wood era to be over (Conway, 2016). From this point forward, it was the wild west in terms of the value of currencies. Each major countries' currency was free to float where market forces determined the exchange rate (Conway, 2016). Additionally, with no currency being backed by gold, or any other commodity, it was the beginning of the era of fiat currency that exists today (Conway, 2016). The question of whether the US dollar would remain the global reserve currency was up for debate.

Although the US was still a global superpower and still the most powerful economically, inflationary pressures by late 1972 were rapidly growing (Shilling, 2010). These inflationary pressures placed a question mark over whether the US dollar could remain a store of value for excess saving. Inflation really set in from October 1973 (Shilling, 2010). In response to western support for Israel in the Yom Kippur War, OPEC nations placed an oil embargo on the nations of Canada, Japan, the Netherlands, the United Kingdom and the US (Shilling, 2010). Although it only lasted seven months, over this time the price for a barrel of oil skyrocketed from \$3.50 to \$11.50, which released massive inflationary pressures throughout the economy (Shilling, 2010).

In order to re-establish confidence in the US dollar, as well as to secure America's energy sources, Richard Nixon and US Secretary of State Henry Kissinger developed the Petrodollar system in 1974, which has been an immensely successful policy for the US to this day (Katusa, 2015). The Petrodollar system initially involved only Saudi Arabia selling oil in US dollars, as well as investing all surplus oil profits in the US. In exchange, the US guaranteed the safety and legacy of Saudi Arabia and the Saudi Family as leaders of the country (Katusa, 2015).

Over time, due to Saudi Arabia's large influence in OPEC, the Petrodollar extended to all members of OPEC (Katusa, 2015). As a result, to this day, with the exception of some Russian and Iranian transactions, any nation wanting to buy oil has to pay with it in US dollars. In doing so, it provides a massive floor for the demand in US dollars (Katusa, 2015). However, this policy, while it has helped in the long-term, did not shore up confidence in the US dollar right away, nor did it help with inflationary pressures within America (Katusa, 2015).

Despite the rise in interest rates, a cycle of future inflation expectations was established into the economy, which led to the continuation of inflation throughout the decade (Steil, 2014).

Between 1977 and 1981, the value of the US dollar lost 50% of its purchasing power (Steil, 2014). The price of gold in 1971 as discussed was \$35 (Steil, 2014). By January 21st, 1980 it peaked at over \$843 as can be seen in Figure 2 (FRED, 2017). This dramatic rise in the price of gold was a reflection of the markets not trusting the US dollar as a reserve currency (Steil, 2014). By this stage, the US economy was in economic stagnation (Steil, 2014). If the US dollar was to maintain its reserve currency status, the US government had to get inflation under control.

Paul Volcker, elected as chairman of the Fed in August 1979, in an unpopular move among citizens, rose interest rates sharply (Steil, 2014). At their peak, he raised interest rates to 20% in June 1981, as can be seen in Figure 3 (FRED, 2017). Additionally, the tax cuts implemented by President Reagan helped companies grow while also enticing foreign investment, which in doing so, helped restore faith in the US dollar (Conway, 2016). The shock therapy from the interest rate rise and the benefits from tax cuts worked. Inflation fell from 13.5% in 1980 to 1.9% by 1986, as shown in Figure 4 (FRED, 2017). The policies were so successful that the US dollar's value went from a position of being weak in 1980 to a position, in the eyes of the Americans, of being too strong by 1985 (Conway, 2016).

By 1985 the US was running a large trade deficit, particularly vis-a-vis Japan and West Germany (Rickards, 2011). This led to the September 1985 Plaza Accord, in which the finance ministers of West Germany, Japan, France and United Kingdom met in New York (Steil, 2014). With these nations still being protected by the US in the Cold War, they agreed to slowly over time devalue their currencies against the dollar (Rickards, 2011). This policy was very successful. Between 1985 and 1988, the dollar declined 50% against the Japanese yen, 40% against the French franc, and 20% against the German mark (Rickards, 2011). This led to the February 1987 Louvre Accord, signed in Paris, where the same nations agreed to stop the decline in the US dollar which ultimately stabilised its value (Conway, 2016).

From this point on, particularly after the fall of the Berlin Wall in 1989, the world economy entered the period referred to as the great moderation in which economic growth worldwide was strong, inflation low and confidence in the US dollar as the global reserve currency high (Conway, 2016). Even the bursting of the 2000 Dot Com bubble and the Great Financial Crisis 2008, both crises that originated in America, did not dent the US dollar's perception as the global reserve currency (Rickards, 2014). If anything, both crises strengthened the US dollar's roll, owing to the fact the US dollar is perceived as a safe haven currency, or more

pessimistically, in the words of legendary bond investor Bill Gross, “The cleanest dirty shirt” (CNBC, 2012). To understand why this is the case, it is important to study key economic metrics that explain why this is the case.

The US Reserve Currency Today

There are a couple of key metrics that can be studied in order to understand why the US dollar is the sole key reserve currency globally. These included studying both the unallocated and allocated reserves globally, the total currency distribution of global foreign exchange transactions and looking at foreign owned debt denominated by currency.

Allocated and Unallocated Reserves

Focusing on reserves held by nations globally, there are two different types being either allocated or unallocated. Looking at Figure 5, it shows the size and growth of both types of reserves overtime (IMF, 2017). The essential difference between the two is that allocated reserves are where countries globally tell the IMF precisely how much of each main type of currency they own (Conway, 2016). Whereas unallocated reserves are countries that disclose to the IMF how much total reserves they own, valued in US dollars, but do not disclose the specific breakdown of what they own; i.e. how many euros, yen, pounds, etc. (Conway, 2016). As of 2017, 149 countries globally report their allocated reserves and only 52 report reserves on an unallocated reserve basis (IMF, 2017).

Focusing solely on allocated reserves, Figure 6 and Figure 7 show it is evident that the US dollar is the dominant global currency and hence why the US dollar is considered the sole key reserve currency globally (IMF, 2017). As both graphs show, the composition of US dollars owned as foreign reserves is by far the greatest among any of the other large currencies’ IMF, 2017). While not as high as the 72% in 1999, at 64% as of 2017, the US dollar is very much still the sole key reserve currency in regard to global allocated reserves as the next two biggest currencies on this basis are the euro and the British pound at 19.7% and 4.4%, respectively (IMF, 2017).

Total Currency Distribution of Global Foreign Exchange Transactions

The second metric to study is the percentage of global trade that is conducted in US dollars. As Table 1 shows, between 87–90% of all foreign exchange transactions globally since 2001 have been conducted in US dollars (BIS, 2016). The next biggest currency used is the euro that has fluctuated between 31 and 38% over this time period (BIS, 2016). It is important to note these

figures are out of a total of 200% as there has to be two currencies for each transaction (BIS, 2016). Expressed differently, approximately 43–45% of every single transaction globally involved the use of the US dollar on one side of the trade. It is important to note that the Bank of International Settlements methodology does not account for offshore trading, which explains why China's figures appear to be lower (BIS, 2016).

Foreign Owned Debt Denominated by Currency

The final metric to study is the percentage of total foreign owned debt that is denominated in US dollars. It is important to note that while the majority will be US government debt, both Yankee bonds and euro-dollar bonds are included in this data (BIS, 2015). These are two types of bonds that are both denominated in US dollars but are issued by a foreign non-US entity or issued by a US entity to non-US investors, respectively (Investopedia, 2017). Expressed differently, both the Yankee bonds and euro-dollar bonds are denominated in US dollars but are not official US sovereign debt (Investopedia, 2017). Table 2 shows that as of June 2015, the largest currency used for total denominated debt owned by foreign entities was the US dollar at 42.7% (BIS, 2015).

The reason why this metric is important when studying reserve currencies is that in order to be a reserve currency, foreign governments have to have an ability to invest their excess reserves (Eichengreen, 2012). This is because it would not be profitable for a government to hold physical currency as inflation would erode its value. Therefore governments need an asset to invest their excessive reserves. While this can be done with equities and other financial assets, the most common is debt, as it is highly liquid and is generally regarded as a conservative investment that does not wildly fluctuate in value (Eichengreen, 2012). As a result, a country that wants its currency to be a reserve currency has to require foreign entities to purchase their debt (Eichengreen, 2012).

The second largest currency for this dataset is the euro at 39.2% (BIS, 2016). This figure would suggest that the US dollar could not be considered the sole key reserve currency under this metric due to the US dollar and euro being effectively the same. However, the reason why this is not the case is that a large percentage of euro denominated debt is owned by other European countries (BIS, 2016). For example, Germany owns the largest percentage of French sovereign debt, as they both share the same currency, the 39.2% overstates the importance of euro denominated debt as a reserve currency for non-EU nations (BIS, 2016). As a result, the US dollar under this metric is still clearly the most important reserve currency globally.

Conclusion

In conclusion, this chapter has outlined the history of the rise and fall of the key global reserve currencies. Specifically, these have included the Spanish silver, Dutch guilder, French livre, British pound and the rise of the US dollar. Arguably, at the height of their global influence, none of these reserve currencies would have appeared to be at risk of being superseded. However, as was discussed in this chapter, all at some stage were. As a result, just because the US dollar's role as the key global reserve currency appears to be unrivalled today, it does not mean it will be in the future. In saying this, the final section of this chapter shows that the US dollar is without question the sole key reserve currency as of 2017. This is based on allocated and unallocated reserves, the percentage of total world trade that uses the US dollar and for the fact that US dollar denominated debt is the largest currency owned by foreign entities and governments. Therefore, under these metrics, it would not appear the US dollar's status as the sole key reserve currency is in imminent risk.

Ignoring the rise of other currencies (which will be covered in Chapter 6), as mentioned in the introduction, the main threat that will challenge the US dollar's ability to function as the sole key global reserve currency is lost confidence in its ability to act as a store of value. More specifically, lost confidence in its ability to act as a store of value is determined by the US government ability to pay their debt. As a result, when looking at the potential demise of the US dollar's ability to function as the key global reserve currency, it is important to study the overall sovereign debt position of both the US and the six key countries mentioned in the introduction. However, before this, the Debt Super Cycle Theory, along with other supporting theories and economic concepts, needs to be covered as will be done in the next chapter.

Chapter 2: Economic Theory

Introduction

As will be discussed in this chapter, this thesis will use the Debt Super Cycle Theory as the key theoretical framework. However, there are a variety of other important theories and concepts that underpin and support the key aspects of the Debt Super Cycle Theory which will be covered.

These include the following:

Supporting Theories
Financial Instability Hypothesis
Debt Deflation Theory
Quantity Theory of Money
Fisher Equation
Complexity Theory
Bond Vigilantes

Debt Super Cycle Theory

The term debt super cycle was first coined by the influential economist Tony Boeckh back in the early 1970s (Mauldin & Tepper. 2011). Prior to this, super cycle theories in economics had been applied to areas such as interest rates, money velocity, bank liquidity etc. (Forbes, 2010). However, Boeckh, based on the underpinnings of Irving Fisher's work, was the first to apply the term super cycle with debt (Forbes, 2010). It's important to note, Boeckh's work and writings focused only on sovereign debt (Forbes, 2010). The idea behind the Debt Super Cycle Theory is that during the recession and trough years on the economic business cycle, both Keynesian inspired fiscal expansion policies and easy monetary policies are implemented (Mauldin & Tepper, 2011). This, in turn, increases sovereign debt (Mauldin & Tepper. 2011). When an economy enters another recession, the same policies are implemented. The issue is that generally more sovereign debt is acquired during the recession/trough stages than is paid off in the expansion and peak years (Mauldin & Tepper, 2011). As a result, over time, the long run trend is total sovereign debt levels continue to increase with each business cycle, even if some years experience debt reduction (Mauldin & Tepper, 2011).

In the post GFC era, the Debt Super Cycle Theory has increasingly entered into academia and financial market conversations. As discussed in Chapter 3, debt since the end of World War II has been consistently increasing over time with larger jumps in debt generally after recessions (Mauldin & Tepper, 2011). However, the Debt Super Cycle Theory says that this cannot be sustained indefinitely. There comes a point where no new debt can be taken on (Skarica, 2014). Eventually, confidence is lost in governments' ability to pay, bond markets revolt, borrowing interest rates go up, which ultimately make it too expensive for governments to service the debt and pay for public goods (Skarica, 2014). It is important to note, the theory does not try and predict when debt levels will become unsustainable, i.e. when debt to GDP ratio equals 250%, as market confidence is inherently unpredictable (Skarica, 2014). What it does show is that based on the underlying economic fundamentals, eventually there will be a loss in market confidence leading to a debt crisis if nothing is done to improve the underlining economic fundamentals reduction (Mauldin, & Tepper. 2011).

To illustrate this point numerically, Japan's finances will be used. Japan's 2017 budget is outlined to spend ¥101 trillion (The Japanese Times, 2016). For this budget, they are using the assumption that the average rate of borrowing will be 1.6% (The Japanese Times, 2016). If this is the case, the debt servicing cost will be ¥24.62 trillion, which is 24.37% of their total spending (The Japanese Times, 2016). Put differently, 75.63% of the budget can be used to spend on public goods, such as health, infrastructure, education, welfare, etc. If interest rates were to double to 3.2%, an interest rate that is common for advanced nations in normal economic times, effectively half of the budget will be going towards paying off interest. In this case, the Japanese government would have to cut approximately a third of their expenditures on public goods, assuming tax revenue is not increased, just to pay off the interest on the debt, let alone thinking about paying off the principle. This would be socially destabilising and ultimately not sustainable without some form of debt restructuring.

When a government finds itself in this situation, they have four choices. The first choice is grow their way out of the debt (Skarica, 2014). This is by far the most appealing method as debt reduction can transpire while economic growth continues. However, this option is also the hardest to achieve (Mauldin & Tepper. 2011). Moreover, this option requires leaders to be proactive and deal with the crisis before being forced to (Mauldin & Tepper, 2011). The next three options are generally implemented when markets force leaders to react and are economically painful. These include an austerity path, debt defaults and inflating the debt away (Skarica, 2014). All four options are discussed below.

Firstly, if governments take a proactive approach by attempting to grow their way out of debt, they can achieve this by either increasing their population or increase their productivity per worker (Skarica, 2014). Increasing their population is relatively straightforward. Either increase net immigration or provide incentives for woman to have more children (Skarica, 2014). Increasing worker productivity is a lot harder to achieve. This can be done by lowering taxes, cutting regulations, increased infrastructure spending, promoting the adoption of new technologies, etc. (Skarica, 2014). The most crucial aspect to this growth option working is that sustained government surpluses over the medium- to long-term have to be run in order to reduce the debt burden (Skarica, 2014). At the very least, as long as growth rates are greater than the budget deficit as a percentage of GDP, then the total debt to GDP ratio will slowly decline despite net debt levels increasing (Mauldin & Tepper, 2011).

What makes this option so hard to achieve when debt levels are high is that often measures to increase productivity also increase government expenditure, i.e. infrastructure spending (Skarica, 2014). Known as the economic term ‘priming the pump’, advocates for this option point out that spending money leads to greater increases of growth down the road if spent properly (Skarica, 2014). While there are merits to this argument, the payback in increased productivity can have a substantial time lag, i.e. investments in education, and there is still a limit to how large debt can get (Skarica, 2014). Finally, it is also important to note, if government actions and words are seen as credible in growing the economy/running budget surplus, market confidence, all else being equal, will increase, which, in turn lowers borrowing costs, reducing the risk of experiencing a painful debt crisis (Mauldin & Tepper, 2011).

The second option that governments generally only choose when the markets force them to is to undertake austerity measures. Austerity is where governments reduce public expenditure or increase government revenue, to an economically painful level, in order to improve their financial position (Skarica, 2014). For this policy to be successful, and hence to reduce their debt burden, budget surpluses eventually need to be run for multiple years to both lower the debt principle and to restore confidence in the bond market in order to reduce borrowing costs (Mauldin & Tepper, 2011). Additionally, if government actions and words are credible to honour their debt, confidence in the bond market as well as faith in the underlining currency can be restored (Mauldin & Tepper, 2011). Running austerity budgets over a medium term is economically very painful as expenditure cuts into pensions, welfare checks, health care, etc. This makes everyday citizens worse off (Skarica, 2014). As a result, while austerity measures may be necessary, they are obviously not a politically popular path to pursue.

The third way governments can service their debt is to default. Defaulting on debt can be done in a variety of ways, from partial haircuts of the principle, lowering interest rates, increasing the debt maturity date to outright refusing to pay the entire principle (Skarica, 2014). Throughout the centuries there are hundreds of examples of countries defaulting on their debt. Notable examples in recent times include Russia in 1998, Turkey 2001, Argentina in 2001 and 2003 and, of course, Greece that has restructured their debt terms at the expense of creditors (Reinhart & Rogoff, 2011). Going down this route, while it may help lower the debt, creates a host of problems. As they say, “There is no free lunch.” Effectively, defaulting just places the economic burden onto another group, i.e. bond holders, both domestically and foreign, losing the value of their bonds. Defaulting also leads to a loss of confidence, inability to borrow more, at least at cheap interest rates, and often comes at the expense of private citizens’ wealth. This is very harmful for short to medium term economic growth (Mauldin & Tepper, 2011). As a result, defaulting on debt is not a painless option.

Finally, the last way in which governments can service their debt is to inflate their way out of debt, often done by printing money (Mauldin & Tepper, 2011). Again, looking over the prior centuries, there are hundreds of examples of nations debasing their currency to allow them to pay off their debt. As debt is generally fixed in nominal terms, paying off the same debt with inflated currency is an option (Skarica, 2014). However, this increased level of inflation, particularly if it is hyperinflationary, is very destructive to the wider economy (Mauldin & Tepper, 2011). Any citizen who had cash assets quickly finds its value, and hence its purchasing power is far less in high inflationary times. This leads to lower standards of living and wealth (Mauldin & Tepper, 2011).

Financial Instability Hypothesis

The Financial Instability Hypothesis, developed by Hyman Minsky, was revisited and seen in a whole new light after the 2008 GFC (Wray, 2015). Famed economists from Nobel Prize winning Paul Krugman, to current Fed Chairwoman Janet Yellen, have acknowledged the deep and insightful ideas of Minsky as being far ahead of his time (Wray, 2015). Although he died in 1996, his theories pointed to future financial crises (Wray, 2015). As a result, Minsky’s work was seen in a whole new light due to the fact so few economists foresaw the GFC.

At the heart of this theory is a phrase he coined: “stability is destabilizing” (Wray, 2015). Hyman argued that financial crises are embedded in capitalism as periods of economic prosperity incentivise borrowers and leaders to act in an increasingly riskier manner (Wray,

2015). This increased risk-taking and excessive optimism leads to financial bubbles that eventually burst (Wray, 2015). As a result, capitalism is predisposed to moving from periods of financial stability to instability (Wray, 2015).

Hyman's theory works from the Keynesian view that investment spending fluctuates with changes in the business cycle (Wray, 2015). Hyman adds to this by incorporating the financial markets to this economic phenomenon. Specifically, Hyman argues that the purchase of assets, such as capital equipment for businesses or houses from households, requires borrowing from the bank in the modern era (Wray, 2015). It is this need for financing that generates structural fragility. In times of increasing prosperity, both banks and borrowers become more optimistic about the future which, in turn, leads to increased risk-taking (Wray, 2015). Banks start to ease up on credit quality eligibility for borrowers, down payment requirements and the type of collateral accepted as down payment (Wray, 2015). Borrowers start to commit larger portions of their expected income to debt service as well as start relying more on short-term lending as opposed to long-term (Wray, 2015).

With increased loans being made, underlying values in assets, particularly housing and land, increase in value. This increase's incentives for borrowers to purchase these assets which leads to higher prices in a self-reinforcing cycle (Wray, 2015). Eventually, borrowers feel prices of assets can only go up (Wray, 2015). Explicitly, Hyman outlined three different phases of financial instability that transpire through the upside of a business cycle. The first phase is the hedge phase where all debt borrowed can have both the interest and principle paid from the expected income of the borrower (Wray, 2015). As more risk-taking transpires, financial instability reaches stage two, the speculative phase (Wray, 2015). It is in this phase where the borrower can pay back only the interest portion of the loan from the expected income (Wray, 2015). The final phase is the Ponzi phase in which neither the interest nor principle can be paid from expected income (Wray, 2015). This phase sees the principle of the loan itself increase. The Ponzi phase lasts as long as the bank is willing to refinance and allow the borrower to continue borrowing (Wray, 2015).

The speculative leading cannot last forever. Eventually, when asset prices stop rising, both borrowers and lenders realise their positions, leaving them short of cash to meet their obligations (Wray, 2015). It is this moment when the financial system turns from being stable to unstable. This is called the Minsky Moment (Wray, 2015). Both the borrower and the bank

liquidate their assets to meet their borrowing requirements which leads to a deflationary credit crunch (Wray, 2015).

Hyman Minsky's Financial Instability Hypothesis theory complements the Debt Super Cycle Theory as it provides an explanation on why too much debt eventually becomes unsustainable. While the Financial Instability Hypothesis has been discussed in terms of household debt and corporate debt, it can also be applicable with sovereign debt. The only difference is the bond market is the bank and the household or firm is a government borrowing. Despite these small differences, the same three phases of debt build-up can be modelled with sovereign government debt. As a result, this theory is useful in explaining why governments are eventually forced to choose between austerity, defaulting and inflating their way out of debt if economic conditions deteriorate.

Debt-Deflation Theory

A very insightful theory worth outlining for this thesis is Irving Fisher's Debt-Deflation Theory. This theory was published during the height of the great depression in October 1933 under the title *The Debt-Deflation Theory of Great Depressions* (Irving, 1933). His insights into the cause of the Great Depression is both relevant in explaining the 2008 Financial Crisis as well as the potential for future crisis. In total, there are nine steps to Irving Fisher's Debt Deflation Theory.

The theory starts by assuming there is a period of over indebtedness throughout the economy (Irving, 1933). This leads to (1) debt liquidation by either debtors, creditors or both as they become worried about their ability to pay off debt (Irving, 1933). This debt liquidation leads to distress selling, leading to (2) a contraction of the deposit currency as bank loans are paid off (Irving, 1933). As the money supply decreases, the velocity of money correspondingly decreases (Irving, 1933). Both the contraction of deposits and the slowdown in the velocity of money lead to (3) a fall in the level of prices or, in other words, an appreciation of the dollar (Irving, 1933). This is assuming that the fall in prices is not interfered with by artificial inflationary measures (Irving, 1933).

If this is the case, then there will be (4) a greater fall in the net worth of businesses which will lead to increased bankruptcies (Irving, 1933). This leads to (5) a fall in profits in a capitalist economy (Irving, 1933). With the fall in profits, (6) both a reduction in output and an increase in unemployment result (Irving, 1933). With output falling and unemployment rising, (7) in pessimism in growth and a loss in confidence transpires (Irving, 1933). This leads to (8)

hoarding and a continual slowing of the velocity of money (Irving, 1933). In total, the above eight steps lead to (9) a complicated disturbance in the rate of interest particularly as the nominal rate decreases and the real rate rises (Irving, 1933).

A very important consideration that Irving Fisher notes is that the value of the dollar may appreciate in value faster than the number of dollars owed shrinks as a part of the liquidation process (Irving, 1933). Or in other words, due to the deflationary pressures that come with liquidation, the real value of the debt gets bigger despite portions of it being paid off (Irving, 1933). This theory fits well with the Debt Super Cycle Theory as it provides an additional step by step process explaining how too much indebtedness leads to a deflationary environment. This theory, like Hyman Minsky's Financial Instability Hypothesis, is useful in explaining why governments can find themselves in a position where they must choose between defaulting, austerity measures or inflating the debt away.

Quantity Theory of Money

This theory relates to the inflation option of the Debt Super Cycle Theory. Specifically, this theory explains how money printing by a Central Bank leads to inflation and, in some cases, hyperinflation. This theory was developed by Milton Friedman in the 1970s and is a central theory related to the Monetarist economic school (Investopedia, 2017). Although the ideas underpinning the Quantity Theory of Money can be traced back to classical economic thinkers, as well the work of Irving Fisher, it was Milton Friedman who advanced its implications (Investopedia, 2017). Monetarist's view inflation primarily as being positively correlated with the monetary supply (Investopedia, 2017). At the centre of this view is the Quantity Theory of Money, which can be expressed as $M \times V = P \times Y$ (Investopedia, 2017).

M being the money supply which can take on various definitions (M0, M1, M2, M3).

V is the velocity of money which is simply the rate a dollar changes hands. For example, a money velocity of three represents a single dollar changing hands three times within a given time period, usually a year.

P represents the price level (inflation level) for a given time period.

Y represents the real GDP or income for the economy for a given period.

Key aspects of this theory include assuming velocity of money is constant, an increase in the money supply will lead to an increase in inflation (P) and/or real growth (Y) (Shilling, 2011).

However, if the economy is at full capacity, then the increase in the money supply will lead to a direct increase in only the inflation rate (Shilling, 2011). If you relax the assumption of the velocity of money being constant, then an increase in the money supply can lead to two outcomes. Firstly, both inflation and real growth can remain constant if the velocity of money decreases by the same percentage as the increase in the money supply (Shilling, 2011). Secondly, a combination of all three variables can change if the mathematical identity is held (Shilling, 2011).

As money printing according to the Monetarist School is inherently inflationary, central banks should solely focus on price stability by only incrementally changing the money supply to accommodate the needs of growth (Shilling, 2011). It is also important to note that an increase in the money supply can have a time delay between when it is increased and when it impacts on inflation (Shilling, 2011). For example, money that was printed in the US during the 1960s did not result in elevated levels of inflation until the late 1970s (Rickards, 2011). As a result, just because immediate inflation does not transpire from money creation, it does not mean it will not lead to inflation in the future.

The Fisher Equation

The Fisher equation was derived in the 1930s by Irving Fisher, the same economist behind the Debt-Deflation theory (Investopedia, 2017). Simply, the real interest rate is equal to the nominal interest rate minus the inflation rate ($r = i - \pi$) (Investopedia, 2017). From the perspective of a debtor, they want negative real interest rates. Negative real interest rates, as the equation above shows, is when the inflation rate is greater than the nominal interest rate (Middelkoop, 2015). Debtors want a negative real interest rate as it means the debtor can pay off the creditor in the future with dollars worth less than today, as inflation erodes the value of each dollar (Middelkoop, 2015).

In a complete reverse to this, having positive real interest rates is bad for debtors and good for creditors. This is because debtors have to pay more money in real terms as inflation rates are not high enough to erode the higher nominal interest rate required to pay (Middelkoop, 2015). Looking at this from a government's perspective, they want inflation rates to be greater than the interest payments they have to pay on their sovereign bonds (Middelkoop, 2015). This is a very important point that will be addressed at length in Chapter 4 when looking at monetary policy implementation in the post GFC era.

Complexity Theory

It is a well-known fact that economics as a science is notoriously horrible at predicting recessions. It is of little surprise individuals such as Laurence J. Peter have joked “an economist is an expert at telling you tomorrow why the predictions he made yesterday did not come true today” (Shilling, 2011). In the 13 US recessions since the Great Depression, the consensus among economists have not predicted a recession before it occurred (Shilling, 2011).

A relatively new branch of science that is being pioneered in terms of its application to financial markets is Complexity Theory. Edward Lorenz developed Complexity Theory in 1960 when he studied the unpredictable nature of meteorology (Rickards, 2016). Lorenz was studying atmospheric flows and found that minute changes in initial conditions can lead to widely different outcomes in flow (Rickards, 2016). In effect, all being equal, one small change to a system on a particular day can lead to dramatically different outcomes to other days. It is from this work where the famous ‘butterfly effect’ comes from. The idea being a butterfly’s wings flapping in New York can create hurricanes in the Gulf of Mexico (Rickards, 2016).

Since Lorenz’s development of Complexity Theory, it has been applied to a wide range of systems that are both manmade and natural. Some examples of manmade systems include nuclear bombs or traffic jams and earthquakes, solar flares and avalanches for natural systems (Rickards, 2016). It’s important to note, systems such as a Swiss watch may be complex, but they are not a complex system because there is no unpredictable nature to the systems function. For example, the hands do not suddenly spin counter clockwise. However, as mentioned, Complexity Theory is also highly applicable to financial markets.

To be a complex system there needs to be four aspects. Firstly, there needs to be agents which are simply independent actors in a system (Rickards, 2016). With regard to the finance market, the agents are the investors who participate in the financial markets. Secondly, the system should have a feedback or an adaptive behaviour aspect from the agents (Rickards, 2016). This means that the agents can learn from and adjust their behaviour based on prior moves in the system. In the stock market, an investor who loses money is likely to adjust their investment strategy in the future to prevent further losses. Similarly, if an investor sees other investors buying an asset in large quantities, a herd mentality of investors following the ‘smart’ money can transpire.

Thirdly, the agents need to be diverse (Rickards, 2016). If they are identical then the adaptive behaviour will be weak as one agent's behaviour will reinforce the other agent's behaviour instead of changing it. Looking at the financial markets, investors are located all across the globe coming from a wide range of economic backgrounds. Additionally, investors can be small retail investors or large institutional investors and everything in between. Finally, the last aspect of a complex system is there has to be a channel of communication and interaction between the different actors to facilitate feedback and adaptive behaviour responses (Rickards, 2016). With the internet and TV, news media outlets (such as CNBC, Bloomberg and Reuters) can connect investors with current market conditions in real time in a highly efficient manner. As a result, due to the financial markets strongly demonstrating all four aspects of a complex system, using Complexity Theory as a framework is valuable for insight into the financial market's stability.

An implication of Complexity Theory is that the system is inherently unstable and will eventually move from being in a state of calm to a state of chaos (Rickards, 2016). Additionally, you cannot tell the key event that will trigger the complex system to change its state from calm to chaos, just like you cannot predict the one snowflake that will cause the avalanche or the one hydrogen atom in the sun that will trigger a chain reaction causing a solar flare. However, what you can do with Complexity Theory is study the underlying dynamics of the complex system and make observations about the degree of instability in the system as a whole (Rickards, 2016). This is the equivalent of studying the size of the snow pack and its potential for creating an avalanche.

This idea of complexity fits very well with the Debt Super Cycle Theory, as Debt Super Cycle Theory, like Complexity Theory, does not specify a specific debt to GDP ratio when debt becomes unserviceable/unsustainable. Instead, as has been discussed, the Debt Super Cycle Theory says that debt at some point becomes unsustainable by looking at the underlying financial foundation of debt levels. Therefore Complexity Theory explains why it is more important to look at the stability of the overall sovereign debt levels instead of trying to predict a specific level of debt or event in which debt levels become unstable. For example, the Debt Super Cycle Theory could not predict why Greece entered their debt crisis at a debt to GDP ratio of 170% whereas Japan, with a debt to GDP ratio of 235%, has remained crisis free. But Complexity Theory can explain that Japan's debt level is unstable and becomes increasingly susceptible to a crisis the bigger it gets and the longer the time goes before it is addressed.

Bond Vigilante

The last important concept to cover is the term Bond Vigilante, which was coined in 1983 by US investment strategist Ed Yardeni (CNBC, 2016). This term describes a bond market investor who protests, or stands up against, fiscal or monetary policies they consider to be inflationary, by selling bonds which increases the interest rate on the bond (Roubini & Miam, 2010) Generally, Bond Vigilante respond to over indebtedness of a country or company who have an elevated risk of defaulting (Roubini & Miam, 2010). Investors not wanting to be defaulted on, sell their bonds (Roubini & Miam, 2010). This leads to a decrease in the value of the bond which, in turn, leads to more investors selling in fear of further downside (Roubini & Miam, 2010). This cycle becomes self-reinforcing until the country or company takes measures to reduce their default risk or when speculative investors buy in an attempt to get a bargain (Roubini & Miam, 2010).

There are two notable examples of this phenomenon transpiring. In the US, from October 1993 to November 1994, 10-year bond yields increased from 5.2% to 8.0% (Forbes & Ames, 2014). This was due to fears of the Clinton administration's budget (Forbes & Ames, 2014). In the years that followed, the Clinton administration balanced the budget and ran three budget surpluses which ultimately restored confidence in the US bond market (Forbes & Ames, 2014). The second notable example is from the European sovereign debt crisis where the nations of Portugal, Ireland, Italy, Greece and Spain (PIIGS) all saw their bond yields dramatically rise (Forbes & Ames, 2014). Just looking at Greece in September 2009, their 10-year bond was trading at a 4.5% yield (Forbes & Ames, 2014). By April 2010 it was 9.1%. Ultimately, it reached its peak of 36.6% in February of 2012 (Forbes & Ames, 2014). This concept is useful as it provides insight into how debt goes from being sustainable to unsustainable through the channel of loss in market confidence; a concept that complements the Debt Super Cycle Theory.

Conclusion

To conclude this chapter, the key theory for this thesis is the Debt Super Cycle Theory which states when a government is in a situation of unsustainable indebtedness, the only way to deal with the debt is to grow out of the debt, reduce expenses and/or raise taxes through austerity, inflate away the debt or default on the debt. Additionally, other supporting theories to the Debt Super Cycle Theory that are also valuable for other aspects of this thesis were covered in this chapter. These included the Financial Instability Hypothesis, Debt Deflation Theory, Quantity

Theory of Money, the Fisher Equation, Complexity Theory, and the concept of Bond Vigilantes
With the theory section of this thesis now completed, attention can now focus on the first aspect of the thesis that explores the sovereign debt position of the US and the other six countries studied in this thesis.

Chapter 3: The Rise of Sovereign Debt

Introduction

This chapter will be divided into two key sections. The first section will focus on the US sovereign debt. Specifically, this will involve studying how the US sovereign debt has built up over time, where it is likely to head under the Trump administration and the risks involved with the current debt levels. The second section of this chapter will focus on the other six key countries that are being studied in this thesis. This will involve studying the current debt position of these six countries while also highlighting metrics of the perceived risk of their sovereign debt.

The United States Sovereign Debt

Firstly, looking at the US sovereign debt levels, it is clear they are very high compared historically. As of September 2017, the US official sovereign debt surpassed \$20 trillion (US Government Debt, 2017). Figure 8 shows at a percentage of GDP, the debt to GDP ratio stands at 106%. Historically, this is the second highest level the debt to GDP ratio has ever been. The record at 119% was during when large amounts of debt were required to finance the war (US Government Debt, 2017). As a result, the US debt to GDP ratio is close to being at its all-time high. This section will study the historic build-up of the US sovereign debt followed by the future trajectory of US sovereign debt.

Historical Build-Up of US Sovereign Debt

After the war, the US entered one of the most prosperous periods in which the debt to GDP ratio dramatically depreciated (Merki, 2015). This was due to the fact the majority of budgets were slightly positive or balanced but mainly because the pace of economic growth was outstripping the growth in debt by a wide margin during one of the most prosperous times in US history (Merki, 2015). However, in the 1970s the debt to GDP ratio reached its lowest post WW II level. Since then the subsequent debt build-up that the US has experienced is part of the debt super-cycle (Federal Budget, 2017).

By the time President Ford entered office in 1974, the debt as a percentage of GDP was at its lowest, standing at around 31.2% (US Government Debt, 2017). President Carter, who inherited a percentage of 33.8%, would maintain a debt to GDP level hovering around 31–35% level (US Government Debt, 2017). However, after President Reagan took office, the debt to GDP ratio has rose substantially. Under President Reagan, the debt to GDP ratio went from

31% to 50% in large part due to the generous tax cuts and increased military spending (US Government Debt, 2017). Under President Reagan's eight years, he ran a budget deficit every year averaging -4.125% of GDP (Federal Debt, 2017). During President G.H.W. Bush's presidency, debt to GDP continued to climb from 50%–61% in large part due to the continuation of Reagan's key policies (US Government Debt, 2017).

Over President Clinton's two terms, the debt to GDP ratio dropped from 61% to 54% (US Government Debt, 2017). For the last three years of his presidency, he even ran budget surpluses (Federal Budget, 2017) (Figure 9). Although small, they were the first budget surpluses since Richard Nixon's 1969 budget (Federal Budget, 2017). President G.W. Bush would run a modest 1.2% budget surplus in his first and only year in office, which subsequently is the last budget surplus the US has achieved (Federal Budget, 2017). Thanks to G.W. Bush's tax cuts, his home loan policies and the Iraq War, the debt to GDP ratio increased from 54% to 68% (Federal Budget).

Finally, under President Obama, who inherited the country in the wake of the GFC, the debt to GDP exploded from 68% to 106% of GDP the day he left office (US Government Debt, 2017). The reason why debt increased as much as it did under President Obama's term is due to the large government stimulus that was implemented in order to restore growth in the aftermath of the worst economic downturn since the Great Depression. For example, putting aside the increased unemployment benefits and assistance subsidies that had to be paid out to struggling Americans, the 2009 Troubled Asset Relief Program (TARP) alone added \$700 billion to the deficit (CNBC, 2013). As a result, as Figure 9 shows, large budget deficits, particularly in the years just after the GFC, were generated with some years experiencing double digit deficits (US Government Debt, 2017). This build-up in sovereign debt in the post GFC era has not been without its repercussions and consequences.

In the wake of the 2011 debt ceiling crisis, the debt rating agency S&P downgraded the US sovereign debt rating for the first time ever, from AAA to AA (S&P Global, 2011). In their statement, S&P said, "The downgrade reflects our opinion that the fiscal consolidation plans that Congress and the Administration recently agreed to fall short of what, in our view, would be necessary to stabilize the government's medium-term debt dynamics" (S&P Global, 2011, Para. 3). This shock corresponded with a 20% stock market correction (El-Erian, 2016). In the years following this, there has been multiple prominent institutions warning about the US fiscal health.

Two years later after the 2011 debt ceiling crisis, Congress found itself fighting over the same issue. This time, certain functions of the government had to be closed in October 2013 due to lack of government funds (El-Erian, 2016). Ultimately, the passing of the Continuing Appropriations Act raised the debt ceiling and ended the government shut down but not before confidence in America's ability to manage its debt was negatively impacted (El-Erian, 2016). The Chinese government ran newspapers voiced concerns by saying,

The astonishing failure of the US Congress to put national needs before their partisan interests has sparked fears among investors and governments around the world that maybe it is time to think about the unthinkable. US politicians can discuss, bicker and argue over government spending and economic growth. Kicking cans is one thing, but throwing caution to the wind is not a course of action worthy of the world's leading economy (China Daily, 2013, Para. 8).

More recently, global financial NGOs have voiced concerns over America's debt situation. A June 4th, 2015 IMF report on the US fiscal position concluded, "Public finances in the U.S. remain on an unsustainable path. The inability of the Congress and the Executive Branch to collectively pass a budget and corresponding appropriations bills, creates a level of fiscal uncertainty that is damaging to the U.S. economy" (IMF, 2015, Para. 17). The Bank of International Settlements in a June 2016 report has also warned the US, and the global economy as a whole, that they "cannot afford to rely any longer on the debt-fuelled growth model that has brought it to the current juncture" (CNBC, 2016, Para. 2).

To better understand what a US debt to GDP ratio of 106% means, it's important to compare the size in nominal terms in relation to the rest of the world's economies. As of September 2017, global sovereign debt levels stand at approximately \$65.2 trillion measured in US dollars (National Debt Clock, 2017). Therefore the \$20 trillion US debt makes up 31% of all sovereign debt globally (National Debt Clock, 2017). For comparison, the next biggest nominal debtor is Japan with 14% (National Debt Clock, 2017). So while the US does not have the largest debt to GDP ratio, nor is it the riskiest (like Greek debt), due to its size, it is like a bank that is too big to fail (King, 2016). As a result, any problems or loss in confidence in US debt will be felt globally.

The last point to make in this subsection of this chapter is to study the breakdown of ownership of the \$20 trillion. Figure 10 shows that there are four broad groups that own US debt. As of December 2016, \$5.5 trillion was owned by intergovernmental offices, \$2.5 trillion by the

Federal Reserve, \$6.1 trillion by foreign governments, and \$5.5 trillion by private investors (Federal Reserve, 2017; US Department of Treasury, 2017). Intergovernmental debt is debt that is owned by governmental institutes such as the social security fund. Generally, these government agencies are only buyers and not sellers of US debt. As will be covered in detail in the Quantitative Easing section in the next chapter, the majority of the \$2.5 trillion owned by the Fed has been purchased in the post GFC era. While the Fed has indicated they will slowly start selling their ownership of US debt, in the post GFC they have been only buyers of US debt.

As Figure 11 shows, of the \$6.1 trillion owned by foreign governments, Japan and China are by far the largest holders of US debt standing at \$1,115.1 billion and \$1,059.7 billion, respectively. If confidence in the value of dollar starts to deteriorate, foreign governments, most notably the Chinese, would likely quickly sell their ownership of US debt. This would exasperate the weakening confidence in the US dollar. Therefore foreign governments can quickly become net sellers of debt. The final group of ownership is the \$5.5 trillion owned by private investors. These include private household, pension funds, investment banks, insurance companies, etc. Like foreign government ownership, private investors can quickly become net sellers of debt if confidence in the US dollar are placed in question. Now that the historical build up and the current sovereign debt position have been explored, this chapter will now turn towards studying the likely future trajectory of US sovereign debt.

Future Build-Up of Sovereign Debt Under President Trump

Looking forward under President Trump, while it is too early to tell definitively which direction US debt will head, future sovereign debt under President Trump is likely going to continue to increase. While Donald Trump's 2018 budget is not finalised, as it still has to pass congress sometime in the second half of 2017, it is clear that if he gets his way, sizeable cuts to a variety of soft policy programmes will be implemented (The United States Whitehouse, 2017). These include funding for programmes such as global warming, NOAA, the arts, foreign aid etc (The United States Whitehouse, 2017). Together, these proposed reductions in Non-Defence Discretionary spending is set to decrease by \$54 billion for 2018 (Committee for a Responsible Budget, 2017). While these cuts do indeed improve the budget, cuts need to be made from the Social Security/unemployment benefits, Medicare and health, and the military as these three areas of expenditure make up approximately 75% of the total budget (The United States Whitehouse, 2017).

With regard to Medicare, Trump's proposal would see \$903 billion saved over a 10-year period, which is a sizeable cut (Committee for a Responsible Budget, 2017). Looking at social safety nets, they are expected to be cut \$272 billion over the next 10 years (Committee for a Responsible Budget, 2017). Education reform, particularly with cutting subsidies to student loans, will be reduced by \$143 billion (Committee for a Responsible Budget, 2017). Finally, all other expenditure cuts are expected to save \$560 billion over the next 10 years (Committee for a Responsible Budget, 2017).

While the above are sizeable cuts, there are areas of expenditure that President Trump plans to increase. Looking at the military budget, President Trump has requested a \$52 billion dollar increase from last year for a total of \$639 billion (The United States Whitehouse, 2017). Additionally, \$200 billion in increased infrastructure spending has been earmarked (Committee for a Responsible Budget, 2017). However, overall net expenditures are expected to decrease from this proposed budget (The United States Whitehouse, 2017). While cutting net expenditure will help improve the budget, implementing President Trump's proposed tax cuts according to the Budget Congressional Office are expected to cost \$5.5 trillion over 10 years (Time, 2017). This obviously will not help the financial debt situation.

Overall, according to the Committee for a Responsible Budget (2017, Para. 21),

Deficits would fall from \$603 billion in 2017 to \$440 billion in 2018, rise to \$526 billion in 2019, and ultimately turn into a \$16 billion surplus in 2027. As a share of GDP, deficits would shrink from 3.1 percent in 2017 to 2.0 percent by 2021 and turn into a 0.1 percent surplus by 2027.

Essentially, it will take 10 years for a budget surplus to be generated under President Trump's budget proposals. It is important to note the assumptions made for the President's budget is that economic growth will average a very generous 3% for the next 10 years.

Looking at Figure 12, it shows that since the GFC, annual real economic growth for the US has only been around 2% (World Bank, 2017). Assuming 3% continuous growth for the next 10 years implies that a recession will not occur unless some non-recessionary years have growth rates in the 4–6% range. Summed up succinctly, Larry Summers, ex-US Treasury Secretary for President Clinton and ex-Director of the National Economic Council for President Obama said,

A business trying to sell stock on the basis of a document half as hype-filled as the Trump budget would be a joke. No reputable investment bank would underwrite

their offering. A great mystery here is why the experienced investment bankers in senior positions in the Trump administration hold the budget of the US to so much lower standards of integrity than they applied in their earlier lives. (Larry Summers, 2017, Para. 3).

The Congressional Budget Office, when assuming growth rates would average 1.9% for the next 10 years, a far more realistic assumption, found President Trump's budget plan would lead to \$3.4 trillion more added to the debt than what the President's plan forecasts (CNN, 2017). As a result, short of Conservative Tea Party Republicans asserting a sizeable amount of influence over America's future budgets, it is likely the total federal debt is going to keep increasing under President Trump's administration. The question is, at what rate?

Although not sovereign debt, municipal and local state debt has also markedly increased in the last two decades (US government Debt, 2017). In recent years there is growing concern that some of the states and sovereign territories will have to be bailed out by the federal government (CNBC, 2017). This would obviously increase the federal deficit as state debt would effectively become sovereign debt. As a result, it's important to briefly study municipal state and local debt. As Figure 13 shows, municipal debt has effectively tripled from \$1.2 trillion in 2000 to \$3.1 trillion in 2017 (US Government Debt, 2017). Although the graph shows it has flatlined since 2010, it does not tell the entire story as some states like California and Florida have improved their budget position while states like Illinois and Texas have sizeably increased their deficit (US Government Debt, 2017). As a result, some states are far worse off than others. Specifically, the worst states and sovereign territories that are most likely to default in the near term are Illinois and the territory of Puerto Rico (CNBC, 2017).

In 2017 Moody's and S&P rating agencies have both downgraded Illinois to a credit rating one above junk status (CNBC, 2017). This is in reflection of the slowly progressing, deteriorating Illinois deficit that has been very messy and politically divisive (CNBC, 2017). The state cannot agree on how to fix the budget as demands to cut teachers' pensions led to multiple strikes over the last couple of years (Washington Post, 2016). For example, calls to cut state employees' salaries led to February 2017 strikes (Reuters, 2017). Making matters worse, the state can't agree on how much Chicago, the state's largest city, should cut spending compared to other smaller cities and towns in the state (Reuters, 2017). In September 2017, at \$203 billion and counting, it is not clear how the Illinois debt crisis will end (US Government Debt, 2017). Many conservative members of Congress have refused to let Illinois be the first state to be

bailed out in fear of setting a precedence for other indebted states to follow (The New York Times, 2017). However, if basic social services cannot be provided, the Federal Government may have to intervene.

Another important example is Puerto Rico. On April 2017, Congress and President Trump decided not to bailout Puerto Rico (The New York Times, 2017). Consequently, Puerto Rico in May 2017 filed a \$70 billion bankruptcy claim making it the largest municipal bankruptcy in US history (Reuters, 2017). In the aftermath of Hurricane Maria, in which Puerto Rico was devastated, it is even more apparent very little, if any, of the \$70 billion will be recovered. As a result, many pension funds and Wall Street banks are set to lose sizeable amounts of money (The New York Times, 2017). Regardless of the outcome in Illinois and Puerto Rico, there are approximately a dozen states that have excessive debt problems, with another dozen or so states that have debt levels that are high (CNBC, 2017). As a result, it is important to acknowledge that in a future nationwide economic downturn, some of the \$3 trillion in state debt may have to be converted into sovereign debt (El-Erian, 2016). It's speculation to try and put a figure on what this could be but it is important to be aware of the growing risk in municipal debt.

The last important aspect to acknowledge when studying the US fiscal position going forward is to study the size of the unfunded liabilities of the US. An unfunded liability is where future payment obligations are greater than the present value of assets on hand to pay them (Investopedia, 2016). The best example of this is the Social Security program. The Social Security program receives money annually from working aged citizens and then uses them to buy assets, such as bonds, as well as to pay for retired individuals receiving their social security cheque (Investopedia, 2016). The problem is that as more people retire and continue to live longer, less and less money from a smaller labour force is generated to pay for the increasing Social Security handouts (Investopedia, 2016). As a result, this fiscal gap between what is expected to be paid out in the future minus what the expected future income will be is the total of the unfunded liability (Investopedia, 2016).

There are many assumptions that must be made when estimating the total value of the unfunded liabilities (CNBC, 2016). Just focusing on Social Security, the Social Security Administration in 2016 projected that unfunded liabilities will reach \$11.4 trillion by 2090 (CNBC, 2016). If unchecked, the infinite horizon calculation gives a value of \$32.1 trillion, which is a staggering figure (CNBC, 2016). Boston University economics professor, Laurence J. Kotlikoff, who also served as a senior economist on President Reagan's Council of Economic Advisers, places the

entire unfunded liabilities of the US using the infinite horizon calculation at a value of \$211 trillion (NPR, 2011). Even if the true value is only \$100 trillion, this is never going to be serviceable. What this means is that government promises, such as receiving Social Security when you retire, over the long-term are not going to be honoured all else being equal (NPR, 2011). So while unfunded liabilities do not impact the budget directly, if and when these unfunded liabilities are reneged, future standards of living will be lower for many middle and low-income households.

In conclusion to this section of the chapter, as Figure 8 and Figure 9 illustrate, sovereign debt build-up since the 1970s has significantly increased, hence why the term debt super cycle has become more widely used. As mentioned, total sovereign debt for the US stands at \$20 trillion. This equates to approximately \$210,000 of debt per American citizen (National Debt Clock, 2017). Based on President Trump's first nine months in office and studying his proposed budget and tax policies, it is likely debt levels are going to continue to increase. With this in mind, it is important to study if the growth in US sovereign debt is unique to the US or part of a global trend.

Other Countries

There are many different metrics to analyse sovereign debt and its perceived riskiness. However, as the studying of the sovereign debt for these six nations is a supporting point and not a key aspect of this thesis, this section will only focus on a couple of aspects. Firstly, an overview of the actual economic debt data will be looked at in order to gain a historical perspective and to show what current debt levels are for the six nations today. Following this, the sovereign credit rating, along with idiosyncratic factors of the six nations' debt, will be discussed. Finally, an overview of the liquid reserve assets of these six nations will be studied.

Economic Data

A June 2017 report by the Institute for International Finance (IIF) found that total global debt (including household, government and cooperate) is now 327% of global GDP at US\$217 trillion (Institute for International Finance, 2017). In 2007, the global debt level value was US\$149 trillion, where it made up 276% of world GDP (Institute for International Finance, 2017). As this shows, like the US data, global debt levels have increased sizably since the GFC. There are many countries with excessive debt levels that could be studied, such as Greece, Portugal, Ireland, Iceland, Belgium, etc. However, as just mentioned, a brief overview of the

six most important countries outlined will be studied simply due to these countries being so large economically.

Firstly, Figure 14 and Figure 15 shows debt levels for all six countries have increased since 2000 (IMF, 2017). Specifically, over this time period, Japan's debt to GDP percentage has increased 100.2%, United Kingdom 51.6%, Spain 40.6%, France 38.8%, Italy 27.7% and Germany 5.9% (IMF, 2017). Except for Germany, these increases in debt are not a positive development. Additionally, again apart from Germany, the five other nations continue to see debt levels increase (IMF, 2017). While the rate of debt build-up has slowed in recent years, with the exception of Germany, it is still moving in the wrong direction for these key countries (IMF, 2017).

Looking at Figure 16, over the last 27 years, particularly between 2008 and 2010 when countries were recovering from the GFC, sizeable budget deficits have been run annually by these nations (World Bank, 2016). This explains why total debt levels continue to rise as governments continue to spend more than they receive in tax revenue. Most of these nations post 2012 have undertaken various forms of austerity measures in an attempt to improve their overall debt position (Bordo, et al., 2016). While deficits have narrowed in recent years, as Figure 14 and Figure 15 shows, overall debt levels continue to increase (with the exception of Germany). As a result, like the US, Italy, Japan, United Kingdom, Spain and France continue to face a situation of debt build-up towards or past historic all-time highs.

Sovereign Credit Ratings and Idiosyncratic Factors

A good indication on the perceived riskiness of these six countries' debt is to study the credit ratings on their debt. The three main global rating agencies are Fitch, S&P and Moody's. The current credit ratings for each country from the three agencies is shown in the table below (Trading Economics, 2017). Additionally, the table shows how many cuts have been undertaken since January 2000. The two countries that have seen the most downgrades are Italy and Spain (Trading Economics, 2017). Both countries were a part of the infamous PIIGS nations in Europe that were at the centre of the European debt crisis (Bordo, et al. 2016). With junk status rating being BB+/ba1, both nations are a two of downgrades away from being in this territory (Trading Economics, 2017).

Sovereign Debt Ratings				
Country	Rating Agency	January 2000	October 2017	# of Downgrades
Japan	Fitch	AAA	A	5
	S&P	AAA	A+	4
	Moody's	Aa1	A1	3
France	Fitch	AAA	AA	2
	S&P	AAA	AA	2
	Moody's	<u>Aaa</u>	Aa2	2
Germany	Fitch	AAA	AAA	0
	S&P	AAA	AAA	0
	Moody's	<u>Aaa</u>	<u>Aaa</u> (Negative)	0
Italy	Fitch	AA-	BBB	5
	S&P	AA	BBB-	7
	Moody's	Aa3	Baa2 (Negative)	5
United Kingdom	Fitch	AAA	AA (Negative)	2
	S&P	AAA	AA	2
	Moody's	<u>Aaa</u>	Aa1	1
Spain	Fitch	AA+	BBB+ (Positive)	6
	S&P	AA+	BBB+ (Positive)	6
	Moody's	Aa2	Baa2	6

With regard to Italy, their economy continues to struggle with high unemployment, to achieve solid growth, deal with their banking system that potentially may need even larger bailouts than what has already happened, and with crippling high levels of sovereign debt (The New York Times, 2017). Fitch's April 2017 credit rating cut reflected this, while they stated that "Italy's persistent track record of fiscal slippage, back-loading of consolidation, weak economic growth, and resulting failure to bring down the very high level of general government debt has left it more exposed to potential adverse shocks" (Financial Times, 2017, Para, 4). Ignoring

external adverse shocks, as can be seen in Figure 17, Italy's banking sector is dealing with crippling high levels of bad debt (World Bank, 2017). As a result, this should be watched very closely as it has the potential to lead to another debt crisis similar to 2012, which could not only bring down Italy, but the wider Eurozone if systemic risk spreads (The New York Times, 2017).

Studying Spain's debt outlook over the last year, rating agencies have acknowledged that their debt position is definitely stable and modestly improving thanks to their growing economy (Bloomberg, 2017). S&P went as far as to say that they could upgrade Spain's credit rating within two years if their "strong economic performance" continues (Financial Times, 2017). Similar praise has also come from the IMF which called Spain's recent economic performance "impressive" (Financial Times, 2017). Yet it's important to put Spain's growth in perspective. As you can see from Figure 18, it took until 2017 for their economy to recover from the GFC (World Bank, 2017). Additionally, they are still struggling with crippling high levels of unemployment, standing at 17.8% as of April 2017 (World Bank, 2017). Plus, their banking sector, while in better shape than the recent past, is still highly indebted with large levels of nonperforming 'zombie' loans from their prior property bubble (Bloomberg, 2017). As a result, while their economy and overall debt position is improving, their debt is by no means risk free.

Japan, which has experienced the third most cuts out of the six nations, is experiencing what some economists have dubbed three lost decades (El-Erian, 2016). Japan has the highest debt to GDP ratio in the world, they have struggled for decades with deflation pressures and have had a hard time achieving sustained economic growth rates (El-Erian, 2016). What has kept Bond Vigilantes away is the fact that Japan consistently runs very large trade surpluses, has a very high level of private savings and has the second largest global reserves (El-Erian, 2016). From S&P ratings, an A rated debt, which is what they give Japan, reflects their definition of "somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations in higher-rated categories. However, the obligor's capacity to meet its financial commitments on the obligation is still strong" (Standard & Poor, 2017, Para. 6). Consequently, while Japanese bonds are by no means risk free, the Japanese government is not the riskiest by a long shot despite having the largest debt to GDP ratio globally.

The United Kingdom and France have only seen modest rating cuts over the last 17 years (Trading Economics, 2017). While debt levels are historically high for both countries, the rating agencies still believe their debt is safe given their AA/aa2 status (Trading Economics,

2017). With regard to the United Kingdom, in recent years they have struggled to achieve robust growth which consequently has led to all three major rating agencies threatening to cut their sovereign debt rating further (Trading Economics, 2017). Reflecting this, the uncertainty with Brexit and the recent British elections, which saw Teresa May's government lose seats, led Moody's to release the following statement:

The likelihood of an abrupt and damaging exit with no agreement has increased since the referendum. The economy has started to slow, and growth prospects could be materially weaker if the UK fails to reach a free trade arrangement with good access to the single market. Additionally, continuously higher budget deficits than expected and further delays in reversing the rising public debt trend would also be negative for the rating (Business Insider, 2017, Para. 4).

Even if the United Kingdom did have their credit rating cut again, they still would be considered relatively safe.

Looking at France, if Marie Le Pen had won the March 2017 elections, all three agencies indicated that they would likely have cut France's credit rating due to her desire to remove France from the EU (CNBC, 2017). However, as pro-business Emmanuel Macron won the presidency; all three rating agencies after the election have indicated France's credit rating is stable and not in risk of being downgraded (Bloomberg, 2017). Prior to Emmanuel Macron's election, the reason why France's debt has become riskier, and hence why all rating agencies have twice cut France's rating in recent years, is because their total sovereign debt continues to rise while also failing to implement the required structural changes to make their economy more business friendly and productive (Bloomberg, 2017). However, the new government promises to cut public expenditure and make the required structural changes to improve the overall financial stability of the French economy (Reuters, 2017). As evidence of this intention, the Prime Minister, Édouard Philippe, recently said,

We are dancing on a volcano that is rumbling ever louder. The French are hooked on public spending. Like all addictions it doesn't solve any of the problems it is meant to ease. And like all addictions it requires will and courage to break the habit. (Reuters, 2017, Para. 5).

While its very unlikely France will have their credit rating upgraded without sizeable debt reduction, it will likely stay stable assuming the French government can improve the business environment.

Finally, Germany, arguably the safest debt to own worldwide, has seen zero rating cuts (Trading Economics, 2017). If Germany continues to run budget surpluses like they have done in recent years, it is very unlikely their debt ratings will be downgraded. However, the rating agencies have indicated in the past that if Germany was to take on a larger role in ensuring the debts of other European nations are honoured, then their rating could be downgraded (BBC, 2011). The last point to make is that rating agencies have been wrong in the past. For example, AIG insurance was rated AA a month before they went bankrupt during the GFC (Huffington Post, 2009). As a result, it is significant to note that Black Swan events, an economic event that is unforeseen or impossible to predict, can dramatically change the credit worthiness of these countries. Therefore it is important to not be overly reliant on what the rating indicates.

Liquid Reserve Assets

Another important way to measure the perceived debt risk of these six countries is to study the amount of liquid reserve assets these countries own. Having liquid reserve assets allows for governments to use them just like a household uses savings (Carbaugh, 2011). Both can use their savings to either pay off debt or to purchase goods without having to issue new debt (Carbaugh, 2011). As a result, the more liquid reserve assets a government owns, the safer their debt is as they are more likely able to meet their debt repayment obligations (Carbaugh, 2011).

Looking at Figure 19, it is clear that Japan, with over US\$1.2 trillion worth of liquid reserves as of 2016, has by far more reserves than the other five countries (World Bank, 2016). However, as has been discussed, they also, by a large margin, have the most debt compared to the other five countries. With the exception of Spain who have reserves valued at \$US64 billion, the other four nations have reserves valued between US\$100 billion and US\$200 billion (World Bank, 2016). While the value of these reserves appears to be sizeable, it's important to compare the size of reserves to the size of the total debt to get a more accurate idea about how it helps reduce debt serviceability risk.

Firstly, it's important to note that the debt of the six nations has been converted into US dollars in order to compare apples with apples. As a result, exchange rate fluctuations can distort the true reserve to debt ratio. It should be noted that the ratio still provides a good indicator of how

much reserves each country has compared to their debt. Looking at Figure 20, it shows that on the whole the six countries have maintained a similar level of reserves as a percentage of their total sovereign debt (FRED, 2017). As of 2016, Japan at 12.36% and Germany at 10.21% have the two highest percentages (World Bank, 2016; FRED, 2017). With regard to Japan, this factor is a major, if not the most important, reason why Japan's debt is deemed relatively safe besides them having the highest debt to GDP ratio globally (King, 2016). In effect, if Japan wanted to, they could pay off 12.36% of their debt outstanding by selling their reserves on hand. For Germany, who already has a low debt burden, this percentage only makes their debt that much safer.

Looking at the other four countries, their reserve to debt percentage stands between 5% and 7.5% for 2016 (World Bank, 2016; FRED, 2017). While the percentage could be worse, the countries of Spain and Italy would definitely benefit from having a higher reserve cushion (Rickards, 2014). Although the nations of Spain and Italy did not use their reserves to protect themselves in the 2012 debt crisis, the market clearly did not believe these countries' reserves on hand were adequate enough as it was (El-Erian, 2016).

Conclusion

As has been outlined in this chapter, debt levels in the US, and the other six countries, are at or near their all-time highs. Both the Debt-Deflation Theory and the Financial Instability Hypothesis outline how excessive debt levels can eventually lead to a debt deflation induced economic/financial crisis. As a result, according to both theories, if debt levels continue to rise, there is the real risk of a debt deleveraging process transpiring. Additionally, another potential impact of these elevated levels of debt is Bond Vigilantes revolting as owners of sovereign debt feel the risk of governments not owning their debts has increased. In this case, the outcome will be an inflationary environment similar to the late 1970s in the US as was outlined in Chapter 1. Effectively, depending on how governments and central banks respond, excessive debt levels will lead to either a deflationary or inflationary environment if the problem of excessive indebtedness is not proactively addressed (as will be discussed in Chapter 5).

With regard to excessive debt levels and its impact on the US dollar acting as the key reserve currency, if confidence is lost in the US government's ability to pay its bills, foreign governments, firms and individuals will question the underlining value of the US dollar. As a result, if there is uncertainty in the value of the US dollar, there will also be uncertainty in the

US dollar's ability to function as the sole key reserve currency. Therefore, as will be outlined in Chapter 5, tough dissections will have to be made in dealing with excessive indebtedness.

As Complexity Theory outlines, predicting the exact debt levels that will cause a debt deflation process or Bond Vigilantes to revolt is pointless as it is impossible to predict; just like it is impossible to predict an earthquake will happen on a specific day and time in the future. However, as debt levels continue to rise, Complexity Theory outlines it becomes more likely a debt crisis will transpire; just like earthquakes become more likely to occur the longer time goes on from the last earthquake. Therefore, from an American perspective, it is vital they ensure debt in the future remains at manageable levels in the eyes of the market in order to ensure the US dollar continues to act as the key reserve currency.

While studying the total debt levels provides a good indication on the overall debt sustainability, it does not provide the entire picture. Specifically, it is also very important to study the monetary easing policies that have been implemented post GFC. As will be outlined and covered in detail in the next chapter, the unorthodox monetary policies that have been implemented have made debt serviceability historically very cheap for both the US and for the other six countries studied. By making debt serviceability cheap, confidence in the US government's ability to pay its future debt, and hence confidence in the underlining value of the US dollar, is improved. In effect, these unorthodox monetary policies have bought the US and the other six countries time in addressing their excessive sovereign indebtedness.

Additionally, the unorthodox monetary policies that have been implemented have helped generate economic growth in the aftermath of the GFC. As will be discussed in Chapter 5, economic growth is a crucial factor in ensuring debt levels can remain sustainable. Therefore studying the role unorthodox monetary policy has played globally in improving debt sustainability is an important factor when looking at the US dollar's ability to continue to function as the key global reserve currency.

Chapter 4: Unorthodox Monetary Policies

Introduction

In the wake of the GFC, unorthodox monetary policies have been implemented to both stimulate economies and to make debt serviceability cheap. From the US perspective, generating economic growth and lowering the borrowing cost both help to improve confidence in the US dollar's ability to remain as a store of value and hence its ability to function as the key global reserve currency. While the benefits and impact of economic growth on the total sovereign debt level will be studied in the next chapter, an explanation on how the unorthodox monetary policies implemented stimulate and generate economic growth will be studied in this chapter.

In addition, this chapter will also describe how the unorthodox monetary policies make it cheaper for the US, and the other six countries, to borrow and service their existing debt. The specific policies implemented in the post GFC era that will be studied include Zero Interest Rate Policy (ZIRP), Negative Interest Rate Policy (NIRP), Quantitative Easing and Moral Suasion. Where applicable, the specific details of the policies that have been implemented by the four key Central Banks will be discussed. The four key Central Banks are the US Federal Reserve (Fed), the European Central Bank (ECB), the Bank of Japan (BOJ) and the Bank of England (BOE). However, before the monetary policies are discussed, an overview of the cost of borrowing for the US and the other six countries in the post GFC era will be studied.

Cost of Government Borrowing

Focusing firstly on the cost for the US government to borrow money, the historic yields of the 1- and 10-year treasury bond will be studied. It is important to study both as there is a difference between the cost of short-term and long-term debt. Figure 21 shows that over the last 55 years, the yield on the one-year treasury has traded at its all-time low in the post GFC years (FRED, 2017). Focusing on Figure 22, it shows that between 2009 and 2016, the cost for the government to borrow for a 1-year bond was between 0.1% and 0.5% which is effectively zero compared to 15% plus percentage that the US government had to pay bondholders in the late 1970s early 1980s (FRED, 2017). While the yield has increased to just under 1.5% in October 2017, it is still at a near historical low. As a result, the cost for the US government to borrow short-term in the post GFC era has been very low and manageable.

With regard to the long-term 10-year bond, like the 1 year, the cost of the US government to borrow in the post GFC era is at a historically all-time low. Figure 23 shows that interest rate yields on the 10-year bond has steadily declined since the early 1980s from 15% to the all-time low of 1.37% in July 2016. As of October 2017, the yield is just under 2.5%. However, considering that the US government has been able to borrow for 10 years at rates ranging between 1.3% and 4% in the post GFC era, it has been historically very cheap for the US government to borrow (Figure 24). Another way to measure the cost of borrowing for the US government is to measure the total interest rate expense as a percentage of the total budget.

As you can see from Figure 25, at 13.2% for 2016, the interest rate expense as a percentage of the total budget expenditure is substantially lower than the 20–28% paid during the 1990s (US Department of Treasury, 2017, Federal Reserve, 2017). Considering that the total sovereign debt level is at its near all-time high as a percentage of GDP, this is a strong indication that shows the cost of borrowing is historically very cheap for the US government. As a result, it is clear that the cost for the US government to borrow money in the post GFC era is at a historical all-time low.

Looking at the other six countries, like the US, the cost for all six countries to borrow are at historic all-time lows for both the short-term 1-year bond and the long-term 10-year bond. Figures 26-29 shows this. There are a couple of important points to mention. Firstly, for Japan and Germany, they have been able to borrow at negative rates for their 1-year bonds. While the graphs do not show this, this is also true for other maturity lengths up to the 7-year bond. This effectively means that these governments charge investors the privilege for them to lend money to them which would have been unthinkable pre GFC. This is due to the fear of deflation transpiring in the future for these economies.

The second important point to note is the 2012 spike in Italian and Spanish yields for both their 1- and 10-year bonds. This is a perfect example of the Bond Vigilante effect. The reason why investors lost confidence in the ability for these countries to pay their debts is due to the European sovereign debt crisis. While confidence was eventually able to be restored, as will be discussed later in this chapter, it is still a very important event to consider. If Bond Vigilantes can attack Italian and Spanish debt, they can attack the US sovereign debt or any of the four other countries studied in this thesis. As a result, just because the cost for the US and the other six countries is at its all-time low, it does not mean it will indefinitely remain low, nor does it mean that it cannot rapidly rise. Now that it has been showed that the cost for the US and the

other six countries are at their all-time lows in the post GFC era, this chapter will now focus on the key unorthodox monetary policies that are responsible for the low government borrowing costs.

Zero Interest Rate Policy

The control of the prime interest rate, also known as the Official Cash Rate, has been the main monetary policy tool for central banks globally, post the Great Depression (King, 2016). When an economy enters a recession, or is in risk of deflation, the prime interest rate is lowered, which also lowers all other interest rates in the economy (King, 2016). The intention of this is to stimulate business investment, consumption spending and export competitiveness through the weakening of the currency (King, 2016). Additionally, the cost of government borrowing also decreases when prime interest rates are lowered (Investopedia, 2015). When the economy is experiencing inflationary pressures, raising the prime interest rate has the opposite effect by making the above four channels more expensive, which in turn lowers inflationary pressures (Investopedia, 2015). ZIRP is simply when the prime interest rate is lowered to zero percent, or very close to it, where it remains for a sustained period of time (Investopedia, 2015).

A major concern with having interest rates at or near zero is the risk of a liquidity trap (El-Erian, 2016). If an economy was experiencing deflation and recessionary pressures, the monetary policy would be to cut interest rates as described above (El-Erian, 2016). However, if interest rates are already at zero percent, then the Central Bank is stuck in a situation where they are hamstrung in stimulating the economy through interest rates trap (El-Erian, 2016). This subsequently, all else being equal, will lead to a more severe recession than if the economy was operating at a higher interest rate. It is this situation that economists call a liquidity trap (El-Erian, 2016). It is a potentially dangerous position for an economy to find itself in long-term and should generally be avoided by central bankers (El-Erian, 2016).

Prior to the GFC, ZIRP policy for a major industrialised country has only been seen in Japan in the wake of their 1989 economic meltdown (Investopedia, 2015). However, since the GFC, we have seen many nations that have lowered interest rates to, or very near, zero percent. The first and most important nation to adopt ZIRP was the US (Investopedia, 2015). In the wake of the GFC, as Figure 30 shows, Ben Bernanke lowered interest rates from a high of 5.25% on June 29th, 2006 to 0.25% on December 16th, 2008 (FRED, 2017). Interest rates would remain at 0.25% for seven years until Janet Yellen increased it by 25 basis points on December 16th, 2015 to 0.50% (FRED, 2017).

Exactly a year later, the second-rate rise to 0.75% was implemented followed by another 25-basis point rise on March 15th, 2017 (FRED, 2017). Finally, the last rate hike took place on June 14th, 2017 to where it currently stands at 1.25% (FRED, 2017). Market consensus as of July 14th, 2017 has priced in one more rate hike by the end of the year at 35% (CNBC, 2017). So while interest rates in the US are now above zero, being only at 1.25% a decade after the last recession is truly unprecedented (CNBC, 2017). If this was a normal economic recovery, interest rates would be expected to be in 5–8% range as has been historically common in post Great Depression business cycles (El-Erian, 2016).

The second biggest block economy, The ECB, has also adopted ZIRP. The ECB has two different interest rates offered to institutional banks (ECB, 2017). The first is the Marginal Lending Facility rate which is the rate charged to banks if they need to lend overnight from the ECB (ECB, 2017). The second is the Deposit Facility rate the ECB charges banks if they park funds with the Central Bank overnight (ECB, 2017). As Figure 31 shows, the Marginal Lending Facility has decreased from 4.25% in late 2008 to its current low rate of 0.25% (ECB, 2017). With regard to the Deposit Facility rate, that has decreased from 3.25% in late 2008 to the -0.4% where it sits today (ECB, 2017). More on the negative interest rate policy will be discussed shortly.

As mentioned above, the BOJ has had interest rates at or near zero for a very long time (Bank of Japan, 2017). Between 1992 to present, the prime interest rate in Japan have fluctuated between 2% and 0.1% (Figure 32) (Bank of Japan, 2017). A discussion on the short term overnight lending rate will be discussed shortly in the NIRP section. As for the BOE, they lowered interest rates from 5.75% at the end of 2007 to 0.5% after the GFC (Figure 33). In the aftermath of the June 2016 Brexit vote, the BOE lowered interest rates further to where they currently stand at 0.25%.

What's important to note is these four central banks are responsible for 55% of the global economy (IMF, 2016). Having this large of a percentage of the global economy operating with ZIRP, or near ZIRP, in the post GFC era is unprecedented and is definitely not the norm in the post Great Depression era (King, 2016). Additionally, it's also important to note that there are other advanced economies that are also operating with ZIRP. The countries of Canada, Demark, Czech Republic, Israel, Norway, Sweden and Switzerland all currently have interest rates at 0.5% or lower (Global Rates, 2017). Finally, the last point to note is that this policy has been sustainable due to a persistent lack of inflation globally.

Looking back to the Fisher equation discussed in Chapter 2, negative real interest rates for governments help erode the value of their debt repayments. Subsequently, these low nominal prime interest rates, which have in turn lowered sovereign bond yields as discussed earlier, are helping to create a negative real interest environment (King, 2016; Investing, 2017). In saying this, the last variable in the Fisher equation, inflation, is making achieving negative interest rates harder for central banks to achieve (King, 2016). As you can see from Figure 34, inflation rates post GFC for the US, United Kingdom, Japan and the EU have been stubbornly low from the Central Bank's perspective (World Bank, 2017). Therefore while zero interest rate policies have helped create a negative interest rate environment, very low levels of inflation post GFC have minimised ZIRP's effectiveness from the point of view of sovereign debt relief.

Negative Interest Rate Policy

Due to the persistent deflationary pressure in the global economy since the GFC, some nations' central banks in the last couple of years have experimented with negative nominal interest rates (King, 2016). This is an entirely new policy that has never been implemented in the modern era of banking (King, 2016). Normally, commercial banks that hold excess deposits with the Central Bank are paid a small interest payment (Skarica, 2014). With negative interest rates, the central banks are charging normal retail banks for having surplus deposits with the Central Bank (Skarica, 2014). This is done to try and force banks to lend money to households and businesses, which, in theory, leads to both inflation and economic growth (El-Erian, 2016). Additionally, NIRP, like ZIRP, lowers bond yields which makes it cheaper for governments to continue to borrow as well as to service existing debt that is rolled over.

The first nation to experiment with negative interest rates, albeit being quasi in nature, was Switzerland in the 1970s in order to counter its appreciating currency (El-Erian, 2016). While it did not stay negative forever, it was the first country to experiment with negative interest rates (El-Erian, 2016). In the post GFC era, the truly first negative interest rate to be implemented was Sweden in 2009, followed by Denmark in 2012 and Switzerland in December 2014 (King, 2016). All three countries were, and are still, perceived by investors as safe haven currencies, which made their currencies too strong from their perspective (King, 2016). Consequently, adopting negative interest rates was a way to deter foreign investors from buying assets dominated in their currencies (King, 2016).

However, the first major Central Bank to implement negative interest rate policy was the ECB. As you can see from Figure 31, on June 11th, 2014 the ECB cut the Deposit Facility rate from

0% to -0.1% (ECB, 2017). Interest rates would be cut three more times each by 0.1% on September 10th, 2014; December 9th, 2015; and March 16th, 2016; to where it stands today at -0.4% (ECB, 2017). So as of time of writing, the ECB charges European banks 0.4% on all excess reserves that are parked with the ECB (ECB, 2017). While most European banks do not charge retail customers a negative interest rate on their deposits, there are some exceptions. All within the month of August 2016, the Bank of Ireland, RBS and Raiffeisenbank Gmund am Tegernsee all started charging interest on depositors with over €100,000 deposited in their banks (Financial Times, 2016). As of time of writing, the ECB has not announced when they will raise interest rates (CNBC, 2017). However, both the German's and the BIS are urging the ECB to start normalising rates sooner rather than later (CNBC, 2017).

The last major Central Bank to implement NIRP is Japan who, in January 2016, lowered their prime interest rate from 0% to -0.1% (Figure 32) (Bank of Japan, 2017). The short term overnight lending rate is charged on excessive reserves commercial banks have with the BOJ. By charging banks to park their money with BOJ, the banks have an incentive to lend the money to the wider economy (King, 2016). As of October 2017, the interest rate of -0.1% is still in place (Bank of Japan, 2017). The latest statements from the BOJ is that the interest rate of -0.1% is stable (CNBC, 2017). However, they will not rule out further cuts into negative territory nor will they indicate when they are likely to increase interest rates (CNBC, 2017).

As with ZIRP, NIRP can also help central banks achieve a negative real interest environment, which in turn helps with the financial debt position of governments as the Fisher equation outlines. If a persistent deflationary environment transpires in the future in the key economies studied, due to high levels of debt studied in Chapter 3, it is very possible the four key Central Banks will implement NIRP into far lower negative rates than what has been implemented so far by the ECB and BOJ. For the US specifically, this would be legally permitted under section 13(3) of the Federal Reserve Act 1913 in which the Fed is allowed to act in any way it sees fit during “unusual and exigent circumstances” (Jacobs & King, 2016).

Quantitative Easing

Quantitative Easing (QE) is a policy in which the Central Bank purchases either government securities, non-government securities, or a combination of both, with the intention of lowering interest rates through increasing the money supply; akin to printing money (El-Erian, 2016). In effect, QE is the Central Bank providing artificial demand for securities with the intention of manipulating the prices of the underlining securities (El-Erian, 2016). More will be discussed

on the specifics of QE policies that have been implemented globally by the four key central banks. Furthermore, this section will conclude by exploring the potential future unintended consequences of QE policies. But before that, the rationale for purchasing government bonds, Mortgage Backed Securities (MBS) and other types of financial assets will be discussed.

Quantitative Easing Economic Impact

The most common security purchased under QE policies has been sovereign bonds (King, 2016). Bond interest rates are inversely related to the underlining value of the bond (King, 2016). So as the Central Bank purchases more bonds, the value increases which subsequently lowers the interest rate yield (King, 2016). This in turn lowers the borrowing costs of governments. The purchase of sovereign debt with QE money is monetisation, meaning the government can issue new debt from newly created money without having to find a market buyer to purchase the newly created debt (King, 2016). Therefore, if there was a run on bonds thanks to bond vigilantes, the Central Bank can be the buyer of last resort (King, 2016). Overall, there are four key ways in which the purchase of sovereign debt with QE money stimulates the economy.

Firstly, by lowering the coupon payment government bonds pay, the appeal for investors to purchase bonds decreases (Bank of England, 2015). This, in turn, incentivises investors to purchase other riskier assets, such as stocks, Real Estate Investment Trusts (REITs), MBS, etc (El-Erian, 2016). This helps prop up these other asset classes which experienced sharp losses during the GFC (El-Erian, 2016). Proponents of QE argued that an increase in the value of these financial assets will lead to the wealth effect (King, 2016). This occurs when an individual experiences an increase in the value of their assets owned. Thus, as they become richer on paper, they will go out and increase consumption spending throughout the economy which in doing so stimulates growth (King, 2016).

Secondly, by artificially lowering the government's borrowing rates, the ability for governments to run large budget deficits to mitigate the GFC is enhanced (Bank of England, 2015). Discussed in the previous section, the massive debt build-up through the large budget deficits that governments ran in the years after the GFC has only been serviceable due to this ultra-low interest rate environment (Mattie, 2016).

Thirdly, as was described in the ZIRP and NIRP sections, lowering the nominal rate for government bonds helps foster negative real borrowing interest rates for governments, as the

Fisher equation explains (Investing, 2017). Finally, although the Central Bank members will not specifically state it publicly, QE has the added benefit of weakening the home currency (Mattie, 2016). The benefit from having a weaker currency is that it increases export competitiveness which in turn stimulates economic growth (Mattie, 2016).

Collateralized Debt Obligations (CDOs), a financial asset that is a type of MBS, were one of the key assets classes responsible for the GFC (Mattie, 2016). A CDO is a collection of mortgages that are combined which offer the owner's frequent payments, like a dividend payment, through the rent collected on the mortgages owned (Mattie, 2016). The benefit behind these securities is that it offers diversification by offering the owners access to a large pool of rent revenues from multiple different mortgages (Mattie, 2016). However, as was discussed, there was systematic risk associated with MBS, which ultimately made many of them either completely worthless or worth a fraction of what they originally were worth when the American housing bubble imploded; i.e. a large percentage of these CDO's were toxic assets (Mattie, 2016). Some of the central banks purchased these MBS at full price for two reasons.

Firstly, by purchasing these MBS off the banks, they were able to in effect bail them out (Gilder, 2016). Some banks, such as Merrill Lynch, had purchased so many, they were effectively bankrupt due to the write off in value of these MBS assets (Gilder, 2016). By purchasing these toxic assets from the banks, their balance sheets were able to be improved slowly overtime (Gilder, 2016). Secondly, by purchasing these MBS from the banks themselves, they received a huge injection of cash which they could either use to purchase and help prop up other asset classes, such as stocks, or could loan these funds out to businesses and households in order to help stimulate the real economy (Gilder, 2016).

Finally, there have been a variety of other financial asset classes that have been purchased by the four key central banks with their QE policies. These included Electronic Traded Funds (ETFs), Stocks, Real Estate Investment Funds (REIFs), cooperate bonds, commercial paper and normal bank loans (Mattie, 2016). These other classes of assets as a percentage of total QE spent far less than bonds and MBS (Mattie, 2016). As a result, the rationale of the purchasing of each asset class will not be covered. In saying this, the purchase of these other financial assets has been largely used to support key segments of the financial markets as well as for the purpose of generating the wealth effect for other owners of these financial assets (Mattie, 2016).

The last important point to note is that QE policies have helped prevent deflation from occurring within the seven key economies studied. As mentioned in Chapter 2, deflation makes the real value of debt greater (El-Erian, 2016). Additionally, a debt deflation trap, highlighted in Irving Fisher's Debt Deflation Theory leads to lower economic growth due to delayed consumption spending (Investopedia, 2017). As a result, central banks have been desperate to avoid deflation. More on this point will be discussed in the last subsection of this section of the chapter.

United States

Although the Japanese BOJ was the first central bank to experiment with QE, as will be discussed shortly, the US Fed was the first post GFC nation to experiment with this unconventional policy (Gilder, 2016). On November 25th, 2008, just two months after the collapse of Lehman Brothers, the head of the Fed, Ben Bernanke, announced the Fed would be purchasing \$600 billion worth of MBS, which, on the whole, were toxic subprime mortgages from the various banks in bad financial health (The Balance, 2016). In addition to this \$600 billion in MBS, the Fed announced it would be purchasing \$100 billion in other debt securities (The Balance, 2016). The Fed also announced they would guarantee the debt of Fannie Mae and Freddie Mac (Gilder, 2016). To give a perspective on the size of these purchases, the balance sheet of the Fed before this announcement was approximately \$850 billion as can be seen in Figure 35 (Federal Reserve, 2016). This policy, known as QE1, almost doubled the Federal Reserve's balance sheet; or expressed differently, was worth 4.8% of GDP (Mattie, 2016).

Despite this \$700 billion in purchases, as well as lowering interest rates to zero as discussed, the economy and the financial markets were still imploding (Gilder, 2016). This is when the Fed increased their QE1 operations by announcing on March 9th, 2009 that they would buy an additional \$750 billion more in MBS, \$100 billion in Fannie and Freddie debt, and \$300 billion of longer-term treasuries over the next six months (The Balance, 2016). The announcement of this policy was sufficient to restore market confidence as this same day coincided with the bottoming of the US stock market (Gilder, 2016).

While QE1 helped start the economic recovery, it was not enough. The second round of QE, known as QE2, was implemented in November 2010 as you can see from Figure 35 (Federal Reserve, 2017). This transpired in the backdrop of fear over a double dip recession where the US economy was on the cusp of experiencing deflation and a further decline in GDP (Mattie,

2016). This new round involved the purchasing of \$600 billion in long-term treasuries over an 8-month period (The Balance, 2016). Additionally, \$250–\$300 billion of MBS that were maturing on their balance sheet were reinvested back into MBS (The Balance, 2016). With the \$600 billion purchased being only US debt with QE2, this policy was focused on stimulating the broader economy more so than the property market (The Balance, 2016). The markets did rally as a result of this policy announcement as would be expected (Gilder, 2016). However, it was relatively short-lived. With the August 2011 S&P US credit downgrade, markets quickly went into a bear market correction with a 20% plus downside movement (Gilder, 2016). To combat this stock market downturn, more stimulus was implemented. This involved the implementation of operation twist, discussed later in this chapter.

The last major QE operation from the Fed was announced on September 13th, 2012 which was subsequently known as QE3 (The Balance, 2016). This policy was different from the prior two with there not being an end date (Gilder, 2016). The policy called for \$85 billion in sovereign bonds to be purchased monthly indefinitely (The Balance, 2016). This announcement was a positive surprise to markets and subsequently resulted in 2013 being one of the strongest years for the US stock market in history (Forbes, 2015). The beginning of the monthly bond value tapering started in December 2013 and finally ended in October 2014 (Forbes, 2015). Crucially, after this point in time, while the Fed was not expanding their balance sheet from this point on, they were rolling over their maturing bonds by purchasing new bonds; effectively keeping their balance sheet constant at \$4.5 trillion as can be seen in Figure 35 (Mattie, 2016).

During a February 2017 Senate Open Banking Committee testimony, Janet Yellen discussed how the possible unwinding of the Federal Reserve’s balance sheet must be “gradual”, “natural” and there must be a “communication plan” (CNBC, 2017), although specifics of what the policy would look like were not forthcoming at the time. After the June 2017 FOMC meeting some clearer insight into how it would look was discussed. In the statement, the Fed wrote,

For payments of principal that the Fed receives from maturing Treasury securities, the Committee anticipates that the cap will be \$6 billion per month initially and will increase in steps of \$6 billion at three-month intervals over 12 months until it reaches \$30 billion per month. (Federal Reserve, 2017, Para. 7).

With respect to the MBS, the Fed laid out a similar approach where it will start tapering \$4 billion a month until it reaches \$20 billion monthly (Federal Reserve, 2017).

However, this is not the official policy, which is expected to be announced during the September 2017 FOMC meeting. A starting date towards the end of 2017 or early 2018 is expected to be announced (CNBC, 2017). It's important to note that during the June FOMC meeting, the Fed officials felt the long-term balance of the balance sheet will be "appreciably below that seen in recent years but larger than before the financial crisis" (BBC, 2017). So it is hard to know what the final balance sheet value will be long-term. What needs to be noted is that this policy could have serious unintended consequences (El-Erian, 2016). As the Fed becomes a net seller of bonds and MBS, they will have to find more buyers, both foreign and domestic, to keep yields on these securities from rising out of control. Particularly if the Fed simultaneously continues to normalise interest rates (El-Erian, 2016). If yields do markedly rise, as they did for Italy and Spain during the European debt crisis, the US will find itself in serious economic trouble simply for the fact the debt servicing expense will rapidly rise due to the large base of sovereign debt (Mattie, 2016). Time will tell how successfully long-term the Fed will be able to unwind their balance sheet.

United Kingdom

In the month of March 2009, the same month the Fed increased their QE1 policy, the BOE announced that they too would be implementing a QE policy (The Guardian, 2009). For the BOE this would involve purchasing an initial £175 billion with the vast majority of it being British Government bonds and a small percentage being high quality British corporate bonds (The Guardian, 2009). These £175 billion were purchased by the end of October 2009 (The Guardian, 2009). At the November 2009 Monetary Policy Committee (MPC) meeting, an additional £25 billion in assets were purchased (The Telegraph, 2009). Over time, at the December 2010, October 2011, February 2012 and July 2012 MPC meetings, additional assets valued at £50 billion, £75 billion, £50 billion and £50 billion were announced to be purchased, respectively, all of which went towards the purchase of British bonds (Financial Times, 2011; BOE, 2016). By this point in the BOE QE programme, a total of £375 billion worth of assets had been purchased (BOE, 2016). Again, the vast majority had been British government bonds (BOE, 2016). The £375 billion in total assets was to be continuously rolled over whenever they matured, which effectively kept the BOE's balance sheet total assets owned constant (Bank of England, 2016).

The £375 billion balance would remain constant for over four years (BOE, 2016). Then, after the June Brexit vote, when there was real concern the British economy may slide, an additional

£60 billion of British bonds and £10 billion of high quality corporate bonds respectively were purchased during the August MPC meeting (BOE, 2016). Additionally, at this meeting, the BOE announced a policy innovation with the creation of the Term Funding Scheme (TFS) (Financial Times, 2016). With the creation of £100 billion in new funds, the BOE effectively gives commercial banks free money on loan on the condition that they use the money to make loans to households and small firms that is at a cheaper rate than the normal market rate (Financial Times, 2016).

The idea behind this policy is that it can stimulate the real economy by making it cheaper for households and firms to borrow (Financial Times, 2016). An additional benefit of this policy is that banks can't use the QE money to purchase stocks and other financial assets as has been common with prior QE policies (Financial Times, 2016). As of time of writing, although the BOE is considering hiking rates, the BOE has not indicated or ruled out whether they will be implementing future QE policies (Bloomberg, 2017). Additionally, with economic uncertainty hanging over the British economy as a result of ongoing Brexit negotiations, it is unlikely the BOE will announce a balance sheet write down like the Fed has announced unless the economy is growing robustly (Bloomberg, 2017).

Japan

As was mentioned earlier, Japan was the first country in the world to experiment with QE policies. Due to what was already a lost decade thanks to the 1989 economic crisis, the BOJ, in March 2001, implemented a QE policy in order to stimulate the economy. This involved tripling the monthly limit of government purchases of sovereign debt from ¥400 billion to ¥1.2 trillion (Federal Reserve Bank of San Francisco, 2006). Also, over a 4-year period they increased commercial banks' current account balance with the BOJ from ¥5 trillion to ¥35 trillion (Federal Reserve Bank of San Francisco, 2006). Overall, it is not clear how successful this policy was as Japan continued to suffer deflationary pressures (Federal Reserve Bank of San Francisco, 2006). Additionally, the increase in government bonds was on a far smaller scale compared to future QE policies from the BOJ.

Japan's next QE policy was announced in October 2010, which involved a relatively small ¥5 trillion worth of sovereign debt buying (Reuters, 2010). A year later another ¥5 trillion was purchased (BBC, 2011). These two one-off asset purchases had a limited impact on inflation and growth. As Figure 36 shows, the next QE policies implemented were significantly larger than the prior QE policies to date. After the announcement of Abenomics in December 2012,

the BOJ started their latest QE policy on April 4th, 2013 (Reuters, 2013; BOJ, 2017). This policy doubled the balance sheet from ¥135tn to ¥270tn within a 2-year period (Reuters, 2013). On a monthly basis, this is worth approximately US\$70 billion (Reuters, 2013). Compared to the US QE3 policy of \$85 billion monthly, Japanese QE policy was massive as a percentage of their economy, considering that Japan's economy is approximately a third the size of the US (Reuters, 2013).

As part of the announcement, the head of the BOJ, Haruhiko Kuroda said, "This is an unprecedented degree of monetary easing. We took all available steps we can think of. I'm confident that all necessary measures to achieve 2 percent inflation in two years were taken today" (Reuters, 2013, Para. 3). With this policy coming to an end, the BOJ shocked the markets on October 31st, 2014 with the announcement that they would expand their QE policy by purchasing approximately ¥80tn annually with no end date (CNN, 2014). Additionally, the BOJ announced that they would be annually purchasing ¥6tn worth of ETFs, ¥90bn REITs, ¥2.2tn commercial papers and ¥3.2tn worth of corporate bonds indefinitely (The Diplomat, 2016).

With regard to winding down the QE policy, Kuroda, on March 2017, for the first time publicly acknowledged that eventually the open-ended QE policy will end and that a wind down of the balance sheet will be on the cards (Reuters, 2017). He stated, "We have a lot of measures at our disposal, so I am sure we can take the most appropriate policy steps while maintaining market stability, which would include reducing the size of our balance sheet" (Reuters, 2017, Para. 5). However, the minutes from the latest BOJ meeting suggest board members are concerned about winding down the QE policy as inflation is still well short of the 2% target (CNBC, 2017).

The BOJ is quickly putting themselves in a corner. As of time of writing, the BOJ owns 37.4% of all Japanese sovereign debt outstanding (Bank of Japan, 2017). It is likely markets will eventually be spooked if the BOJ ends up owning too much of the sovereign debt (El-Erian, 2016). It could be when the BOJ reaches a symbolic 50% or it could be 70%—only the market knows. However, if they ease up on QE they may face deflation, which they are desperate to avoid (Rickards, 2016). What is certain is that eventually there will have to be a policy change as this path cannot continue indefinitely (El-Erian, 2016). Out of the four central banks discussed in this chapter, the BOJ has experimented with QE policies the most and therefore

subsequently is likely to be the first to face unintended consequences of these policies if they come to par (El-Erian, 2016).

Eurozone

The ECB started experimenting with quasi-QE policies during the European sovereign debt crisis between 2010 and 2012. This was done through the creation of programmes such as the Securities Markets Programme (SMP) and the Outright Monetary Transactions (OMT). The SMP was set up in May 2010 in response to Greece succumbing to Bond Vigilantes (Commonwealth Bank, 2012). Its intention was to sterilise the money supply of European countries by buying and selling the sovereign bonds as needed to keep liquidity stable (ECB, 2010). For example, if investors sold Greek bonds the ECB would buy Greek bonds and vice versa. In total, over its two-and-a-half-year operation, it purchased €212.1bn of sovereign bonds (Commonwealth Bank, 2012). This policy was non-transparent, keeping market participants in the dark as to what countries' bonds they were buying or how much they were buying or selling on a monthly basis (Commonwealth Bank, 2012).

Two years later on August 2nd, 2012, when it was apparent Spain and Italy were on the verge of defaulting thanks to the Bond Vigilantes, the ECB replaced the SMP with the OMT (ECB, 2012). The OMT called for the purchase of sovereign bonds aimed "at safeguarding an appropriate monetary policy transmission and the singleness of the monetary policy" (ECB, 2012). This intentionally ambiguous statement made it unclear at what level of risk and market uncertainty the ECB would intervene in the market. The real success of this policy is that the OMT never purchased a single bond as the credible threat that they would do so, along with Mario's Draghi's 'whatever it takes' speech (as will be discussed in the next section), was enough to restore confidence in European bond markets (ECB, 2013). While the SMP and OMT were quasi-QE policies, actual QE policies were to come.

As Figure 37 shows, on January 21st, 2015, Mario Draghi announced €1.1trillion would be purchased between February 2015 and September 2016 in €60 billion monthly purchases (CNBC, 2015; ECB, 2017). These purchases were only of government debt (Bruegel, 2016). Germany was, and continues to be, in express opposition to QE policies, as Germany believes in sound money policies and feels QE is akin to bailing out countries (Bruegel, 2016). However, the Germans were compensated by ensuring there is minimum risk sharing as €44 billion of the €60 billion monthly purchases was to be divided proportionally based on the size of each eurozone country (Bruegel, 2016); i.e. Germany being the largest eurozone country, would

have the biggest percentage of the €44 billion being used to purchase German bonds. Also, there were eligibility criteria that was placed on the purchasing of sovereign debt (Bruegel, 2016). In addition to the bonds having a yield above the deposit rate, the ECB was not allowed to own 25% of a single-issue limit nor could they own 33% of an issuer limit on Eurosystem holdings (Bruegel, 2016). This was put in place to minimise the ECB's ownership, and therefore control of a single country's bonds (Bruegel, 2016).

With inflation still subdued, on December 3rd, 2015, the policy was expanded by an additional six months until March 2017 (CNBC, 2015). As part of this announcement, Mario Draghi said QE policies would continue “until we see a sustained convergence towards our objective of a rate of inflation which is below but close to 2 percent” (Bruegel, 2016). Additionally, as part of the policy expansion, regional and local government bonds were added to the list of assets that could be purchased (CNBC, 2015). During the March 2016 ECB meeting, it was deemed that inflation was still too low. Subsequently, the monthly bond purchases were increased from €60 billion to €80 billion (Financial Times, 2017). Starting in June 2016, the ECB announced that they would start purchasing corporate bonds with the newly created QE money (Financial Times, 2017). As of June 2017, only €75 billion of the total €1.8 trillion of QE money had been used to purchase corporate bonds (Financial Times, 2017).

At the December 2016 ECB meeting, the ECB surprised markets by saying they will cut monthly purchases from €80 billion back to its original €60 billion a month (Financial Times, 2016). Mario Draghi insisted this was not a tapering move and said, “This is the first small step towards the exit, but the exit will not be rushed” (Bloomberg, 2017, Para. 3). While the rate of monthly asset purchases decreased, the ECB increased the policy for an additional nine months until the end of 2017 (Financial Times, 2016). As of October 2017, the latest official stance from the ECB on their QE policy is that, “if the outlook becomes less favourable, or if financial conditions become inconsistent with further progress towards a sustained adjustment in the path of inflation, the Governing Council stands ready to increase the program in terms of size and/or duration” (CNBC, 2017, Para. 3). Market consensus is split with some market commentators guessing the ECB will announce a tapering plan while others, such as the French Bank Societe Generale, believe QE will be extended well into 2019 (CNBC, 2017). As a result, the jury is out as to how many trillion euros the ECB's QE policies will ultimately be.

Potential Unintended Consequences of Quantitative Easing Policies

What should be evident is that the QE policies that have been implemented by these four central banks have been very large in scale. As evidence of this, looking at Figure 38, the four central banks' balance sheets as a percentage of GDP is far greater in 2017 than it was before the GFC (FRED, 2017). Consequently, central banks and their actions now play a greater role in the financial stability and overall economic health of the global economy (El-Erian, 2016). The last important aspect that needs to be addressed is to consider why inflation has been non-existent in the post GFC era despite the size and scope of these money printing policies.

Recapping the quantitative theory of money, assuming the velocity of money is constant, an increase in the money supply leads to an increase in inflation and growth. In reality, both inflation and economic growth in the seven key countries has been on the whole lower than 2% in the aftermath of the GFC (World Bank, 2017). Specifically, looking at the US, Figure 39 shows that the monetary base has increased from around \$900 billion in 2008 to around \$4 trillion today thanks to the QE policy 1 (FRED, 2017). The broader M2 measurement of money shows an increase from around \$7.5 trillion to \$13.5 trillion over the same time period (Figure 40) (FRED, 2017).

The reason why this very large increase in the money supply has not been inflationary is due to the substantial fall in the velocity of money. Again, looking at the US, the velocity of money for both the M1 and M2 money supply has decreased substantially (Figure 41 and Figure 42) (FRED, 2017). With regard to the other three key central banks, they too have all seen their velocity of money for their currency decrease substantially over the last few years, despite the large increases in the money supply thanks to the QE policies (El-Erian, 2016).

A big reason for the decrease in the velocity of money is that the QE money that was handed out to the commercial banks has largely been used to repair their balance sheets in the aftermath of the GFC (El-Erian, 2016). Additionally, a sizeable percentage of this QE money has been invested in financial assets, such as stocks and bonds, instead of being used to make loans for households and small and medium businesses (El-Erian, 2016). This QE money being tied up in financial assets generally does not change hands nearly as often as it would in the hands of households and small to medium businesses, who generally have a high marginal propensity to consume (El-Erian, 2016). As a result, the velocity of money for the four key currencies has decreased.

However, in the future, due to the Bond Vigilantes phenomenon, if confidence is lost in the US ability to pay its debt, or for the other three currencies and their governments, the velocity of

money could start to increase at a relatively rapid rate (El-Erian, 2016). The reason why it could be rapid is due to the self-reinforcing cycle of high inflation incentivising increased rates of consumer spending/selling of financial assets dominated by USDs (El-Erian, 2016). This, by definition, is an increase in the velocity of money. As was mentioned in Chapter 1, the money printing the US did in the 1960s as part of the guns and butter policies of Lynden B Johnson did not lead to high inflation until the mid-1970s (Jordan, 2015). Therefore just because the scale of money printing that has been implemented through these QE policies has not resulted in high inflation as of yet, it does not mean it will not transpire in the future due to a time delay (El-Erian, 2016). More on this point will be discussed in Chapter 5, as it has very important implications for the future of the US dollar.

Moral Suasion (Foreign Guidance)

Moral suasion is an economic/political term for the ability of politicians and central bankers to use persuasion to, but not force, the market to act in a way the governments or central bankers want them to (Jacobs & King, 2016). With regard to central banking and monetary policy, moral suasion, also known as foreign guidance in finance terms, has become a far more important tool used by central bankers in the post GFC era (El-Erian, 2016). While moral suasion does not directly lead to economic growth or reduced borrowing costs for governments, it can indirectly influence both through instilling confidence into market participants. Moral suasion can be conducted through inflation rate targeting, dot plot graphs, and through market commentary.

Inflation Rate Targeting

Throughout the second half of the 20th century, on the whole, central bankers were quiet in the sense that markets did not pay attention to their words or guidance anywhere near to the degree they do today (El-Erian, 2016). In fact, regular announcements from central banks on the whole were not existent and commonly only took place when actual changes to monetary policies were implemented (El-Erian, 2016). Generally speaking, central bankers had a very high degree of autonomy; with a strong degree of non-transparency in the sense that it was not always clear as to the rationale and reasoning for changes in monetary policy (El-Erian, 2016). However, over time this has changed and particularly in the post GFC era.

Before 1989, no central bank globally outlined their effective targeted inflation rate (El-Erian, 2016). The first country to do so was New Zealand with the signing of the Reserve Bank of

New Zealand Act 1989, better known as the Policy Target Agreement (El-Erian, 2016). Now virtually every major central bank globally outlines and communicates to the market a range of inflation that they are comfortable with before taking monetary policy action (El-Erian, 2016). With regard to the four most important central banks globally, the BOE was the first of the four to implement an inflation target of 2.5% in 1998 (Bank of England, 2017). This rate was later decreased to 2% in 2003 (Bank of England, 2017).

The ECB since its inception in 1998 also implemented an inflation target rate (ECB2017). Instead of aiming for 2% inflation, their mandate originally was to keep inflation under 2%. However, this changed in 2003 to a mandate of keeping inflation around 2% and not necessarily under 2% (ECB, 2017). In the post GFC era, where deflation has been a real concern globally, the Fed finally implemented a 2% or greater inflation target in January 2012 (Federal Reserve, 2015). A year later, the BOJ in January 2013 also set a target of 2% inflation or greater (Bank of Japan, 2013).

Dot Plot

The US Federal Reserve, under Ben Bernanke, created the Fed dot plot in January 2012 as a new way in which the Fed is able to jawbone the market (El-Erian, 2016). After each Federal Open Market Committee meeting, the 16 Fed board members give two forecasts, one at the end of the calendar year, and a long-term forecast on where they expect the prime interest rate will be in three years (Jacobs & King, 2016). These 16 individual forecasts are then graphed on a dot plot in which the degree of agreement or disagreement on future interest rates can be seen based on the spread of the 16 dots (Jacobs & King, 2016). This insight into where the Fed board members see future interest rates is a very strong telegraph tool (El-Erian, 2016). Financial markets watch the Fed dot plot closely and act on the results accordingly.

If the Fed wants higher interest rates but knows the economy is likely too weak to raise interest rates, telegraphing that the Fed is likely to raise interest rates, even if they do not privately think it is feasible, is a strong tool in coercing the market to meet their objective (Jacobs & King, 2016). As a result, this new telegraphing tool is increasingly playing an important role in stimulating financial markets to meet the Federal Reserve's objectives. The other three main central banks (BOJ, ECB, BOE) currently do not use the dot plot as a tool of foreign guidance although the BOJ members in 2017 discussed the possibility of implementing such a tool (Bloomberg, 2017).

Market Commentary

With the rise of the internet, social media and financial TV programmes, the media has, over time, increased their coverage of central bankers' actions and words (Jacobs & King, 2016). In addition to widely circulated Federal Open Market Committee (FOMC) minutes being distributed, press conferences started to become a regular occurrence (Jacobs & King, 2016). From 2011, Ben Bernanke started doing press conferences once every two months in which he would explain the decisions and rationale of what the Central Bank was thinking (Jacobs & King, 2016). Ben Bernanke's predecessor, Janet Yellen, as well as the heads of the major central bankers of the ECB, BOJ and BOE, have started and continued to do the same (Jacobs & King, 2016). The words from the FOMC minutes, as well as the spoken words from the central bankers themselves are now so scrutinised, investment banks have created computer algorithms that interpret these words and make investment decisions in microseconds in order to get ahead of the markets (Jacobs & King, 2016). This shows to what level and impact central bankers' words have in today's world.

While there are many examples of central banker technocrats' words having enormous impact on markets, there are three that are highly notable and influential for the global economy that will be briefly discussed. These include Mario Drago's (of the ECB) 'Whatever it takes' speech; Ben Bernanke's 'Taper Tantrum' speech; and the words of Thomas Jordan, the head of the Swiss National Bank (SNB), used in the months prior to the time the Swiss broke their Euro Peg.

In mid-2012, the eurozone debt crisis was at its peak intensity. At this time, Italy and Spain, the third and fourth largest eurozone countries respectively, were paying long-term interest rates north of 5%, shown in Figure 27 and Figure 29 (Rickards, 2016; Investing, 2017). In short, there was a serious possibility of a full on sovereign debt crisis leading to the breakup of the 19-member monetary union (Rickards, 2016). Desperate to prevent this outcome under his watch as President of the ECB, Mario Dragio on July 26th, 2012 announced, "Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough" (ECB, 2012). These strong words worked and were sufficient to keep the euro intact (for now) as sovereign debt yields in the peripheral nations markedly decreased while stock markets globally rallied over the following months (Rickards, 2016).

The second example came when Ben Bernanke, on May 22nd, 2013, indicated that the Fed was considering reducing the amount of monthly QE3 asset purchases (Financial Times, 2013). The

specific words he used were, “If we see continued improvement and we have confidence that is going to be sustained, then in the next few meetings, we could take a step down in our pace of purchases” (Financial Times, 2013, Para. 2). Five large emerging market economies, later known as the fragile five, had become too reliant on undependable foreign investment to finance their future growth (BBC, 2013). These five countries, comprising India, Indonesia, Turkey, South Africa and Brazil, subsequently faced strong capital outflows and therefore painful currency depreciations (BBC, 2013). This market event provides a perfect example showing that, unlike the first example, words can have negative implications for certain economies.

The last notable example of moral persuasion comes from the official statements and words of the head of the SNB, who broke the Euro peg. In December 2014, Thomas Jordan was quoted saying, “The franc is still highly valued. Enforcing the minimum exchange rate of 1.20 per euro is absolutely central to ensure adequate monetary conditions in Switzerland and the SNB stands ready to enforce it by buying unlimited foreign currency” (The Economist, 2015, Para. 6). In the week before the January 15th, 2015 event, Thomas Jordan described the peg as “absolutely central”, while the vice-chairman Jean-Pierre Danthine said 48 hours prior to scrapping the peg that it would remain the “cornerstone” of SNB policy (Reuters, 2015).

This policy was ultimately not sustainable, as one-sided market buying pressure rapidly depleted the SNB’s foreign reserves as they were forced to be net sellers of francs in order to maintain the currency peg at 1.20 franc to the euro (Reuters, 2015). Not wanting to sell all of their Swiss franc reserves, the SNB did a complete U-turn on policy and allowed the peg to be broken (Reuters, 2015). This move, a true black swan moment, shocked markets globally. In addition to currency impacts globally, this shock was particularly hard for the Swiss equity markets and their corresponding export orientated companies (The Guardian, 2015). The CEO of Swiss watch maker Swatch summed up the implications well for many Swiss economic powerhouses when he said in response to the SNB decision, “Today's SNB action is a tsunami; for the export industry and for tourism, and finally for the entire country” (The Guardian, 2015, Para 6).

What this shows is that central bankers are perfectly willing and/or capable of lying in an attempt to cause favourable market movements in order to meet their objective. In the immediate aftermath of the decision, Thomas Jordan was quoted saying, “If you decide to exit such a policy, you have to take the markets by surprise” (Reuters, 2015). This has very

important implications for the wider market in which the credibility and trustworthiness of central banker's actions are put into question. In the words of the chief economist at Swiss bank Sarasin, "In my opinion, this damages confidence in the Swiss National Bank that has always been saying it can keep up the minimum exchange rate. I see big risks in this" (Reuters, 2015, Para 4).

Conclusion

This chapter has shown that there has been a wide range of unorthodox monetary policies that have been implemented globally in the wake of the GFC. To recap, these have included ZIRP, NIRP, and Quantitative Easing and Moral Suasion. On the whole, these unorthodox monetary policies have helped the US, and other developed nations, recover from the GFC through generating economic growth. As will be discussed in the next chapter, economic growth is vital in ensuring total debt levels remain serviceable.

Additionally, these unorthodox monetary policies have also made borrowing costs, and hence debt serviceability, cheaper for the governments studied. In effect, these monetary policies have bought governments time in addressing the growing debt problem outlined in Chapter 3. However, there are limits to the effectiveness of unorthodox monetary policy. Moreover, there could also be unintended consequences of implementing additional unorthodox monetary policy in the future, particularly if it is even larger in size and scope than what has already been implemented in the post GFC era. As will be discussed in the next chapter, the continuation of large scale unorthodox monetary policies could lead to uncomfortably high levels of inflation. As a result, unless governments are willing to accept high levels of inflation, monetary policy cannot indefinitely be used to address the growing sovereign debt levels.

The next chapter will combine the key findings that have so far been discussed from Chapters 1 to 4. Specifically, as referred to in Chapter 2, the four options outlined in the Debt Super Cycle Theory will be studied closely. For each of the four options governments can choose to address excessive indebtedness, a detailed discussion on its merits and pitfalls will be discussed. Additionally, how each option will impact the US dollar's role as the key global reserve currency will be discussed. Two of the options, namely growing out of the debt and inflating away the debt, are intertwined to the unorthodox monetary policies that have been covered in the chapter. Therefore, when discussing these two options in the next chapter, it is important to understand the impacts unorthodox monetary policies have had on sovereign debt levels.

Chapter 5: Responding to Excessive Indebtedness

This chapter will marry the economic theories and concepts outlined in Chapter 2 with the findings from Chapters 3 and 4. Firstly, this chapter will discuss why there will be another debt induced recession/crisis and why fiscal and monetary policy to mitigate its impact are limited will be discussed. Following this, each of the four main options governments face when trying to service debt, as outlined in the Debt Super Cycle Theory, will be studied. To recap, these include the growth path, the austerity path, defaulting on debt and inflating the debt away. As part of the analysis, only the US will be studied. However, broad implications outlined from studying the US debt position are applicable to the other six countries studied. Finally, this chapter will conclude with a discussion on how the US dollar's status as the global reserve currency will be impacted based on the four different possible paths the US chooses to service their debt.

Future Financial Crises in a Globally Interconnected World Economy

It's important to make the point that there will be another global recession/financial crisis. The seminal work of Harvard economists Carmen Reinhart and Kenneth Rogoff on financial crises confirms this (Reinhart & Rogoff, 2011). In addition to a variety of academic journals published on the subject, their book *"This time is Different": Eight Centuries of Financial Folly* outlines every known debt crisis in history. Since the 1638 Tulip Bubble, regarded as the first modern financial crash, the phrase "this time is different" has always been proven wrong when predicting there will be no future debt induced financial crisis and/or recession (Reinhart & Rogoff, 2011). Using thousands of sovereign, corporate and household debt crises as a dataset, it becomes clear, from a historical perspective, that financial crises and recessions are inherently in capitalism (Reinhart & Rogoff, 2011). Unless this time is truly different, unlike the prior thousands of examples, another global recession/financial crisis will transpire (Reinhart & Rogoff, 2011).

Drawing a theoretical principle from Complexity Theory, we can conclude that (like an earthquake) it's a matter of when and not if another financial/economic crisis transpires. In the case of the financial markets, the growing instability is the size of the debt. Complexity Theory states that as debt levels become larger, the systems become less stable (Rickards, 2016). As outlined in Chapter 3, the debt level globally is at its all-time high, which should be a real cause for concern. However, while the financial system may be unstable, as the theory states, you

cannot predict which specific event will turn the financial markets from a point of stability to chaos, just like you can't predict the snowflake that starts the avalanche (Rickards, 2016).

The 'snowflake' could be a collapse of a bank, a sovereign default, a global trade war, the election of a global populist leader, a major terrorist or cyber-attack, a war on the Korean peninsula, etc. (Rickards, 2016). Additionally, it could be a politician or central banker's words that trigger a crisis, such as Richard Nixon's words about the closing of the gold window or Ben Bernanke's words regarding tapering (Rickards, 2016). In addition to Complexity Theory, the financial concept black swan events attest to this problem of not being able to predict the unpredictable (Taleb, 2010). Hyman Minsky, and his concept of the Minsky Moment, also illustrates the point that markets can go from stable to instable in a flash (Wray, 2015). As a result, forecasting to the day, month or even the year that the debt burden becomes destabilising is a fool's guess (Rickards, 2016). What is important is to recognise that the current level of debt is unsustainable and will eventually lead to a day of reckoning if measures are not taken today to deleverage and reduce the instability of the debt levels (Rickards, 2016).

Many prominent and influential individuals in recent times have expressed concerns about a future crisis. In July 2017 the IMF's Managing Director, Christine Lagarde, was quoted saying, "I wouldn't rule out another financial crisis. Where it will come from, what form it takes, how international and broad-based it will be is to be seen, and typically the crisis never comes from where we expect it" (CNBC, 2017, Para. 2) Claudio Borio, the Chief Economist of the Bank of International Settlements, an institute that effectively is the central banks of central banks, in June 2017 warned,

The current ageing and unstable cycle could finish in much the same explosive way, contrary to the widespread belief that it was a once-in-a-century event caused by speculators. The end may come to resemble more closely a financial boom gone wrong, just as the latest recession showed, with a vengeance (The Telegraph, 2017, Para. 2).

In June 2017 the head of the Bank of England, Mark Carney, warned, "Banks are forgetting the lessons of the financial crisis, increasing the risk of reckless lending which could land them, and the wider economy, in trouble later" (The Telegraph, 2017, Para. 4). Finally, famed investor Warren Buffet, who is generally regarded as being a long-term bullish investor, in recent years and on multiple occasions has called derivatives a financial tool that can be used to increase leverage, "a potential time bomb" and a "weapon of mass destruction" for banks'

balance sheets (Bloomberg, 2016). Echoing this concern, in his 2017 annual shareholder letter Buffet wrote, “The years ahead will occasionally deliver major market declines – even panics – that will affect virtually all stocks. No one can tell you when these traumas will occur – not me, not Charlie, not economists, not the media” (CNBC, 2017, Para. 5).

Another important aspect to consider is the degree of interconnectedness in today’s global economy. As the world saw during the 2008 GFC crisis, the crisis that started in the US quickly unfolded worldwide with most countries’ stock markets imploding (Eichengreen, 2012). Even some of the best run economies that had no connection with subprime leading, such as New Zealand or Norway, found their stock markets crashing simply due to the global phenomenon that was the GFC (King, 2016). Looking at long run global exports as a percentage of the global economy, it is apparent that a big degree of the increased global interconnectedness is due to increased trade (Bulkot, 2013). Additionally, with the rise of the internet, and hence the ability to buy and sell global assets nearly instantaneously, it is unsurprising the financial world is as interconnected as it is (Bulkot, 2013).

Looking forward, the next major black swan event is very likely going to be felt globally. The US debt sovereign downgrade, the European sovereign debt crisis and the more recent 2015 China stock market crash are all evidence that markets globally can lose sizeable amounts of value in a short amount of time despite the problems not originating locally. As a result, the saying, ‘when the US (or China or Europe) sneezes, the rest of the world gets a cold’, will be relevant in the years ahead.

This increased global interconnectedness is the key reason it was so important to study the debt and monetary policy situation of the other six countries in Chapters 3 and 4. While this thesis has been predominately focused on the US, a crisis in any one of the other six economies could easily trigger a crisis in the US, or more accurately, speed up the unfolding of an inevitable crisis in the US (El-Erian, 2016). Additionally, it was important to show that debt and unconventional monetary policy was a global monetary phenomenon and not just relevant to the US. Therefore, for example, a run on the Japanese yen, thanks to lost confidence in their government’s ability to pay their debt, could quickly lead to lost confidence in the US dollar’s value. As a result, while there may be some safe havens such as the Australian dollar, the Norwegian krone, Swiss franc etc., it’s not clear at all whether any of the four key global currencies will act as a safe haven currency if a full-on debt crisis and a crisis in confidence in fiat currencies engulfs the developed world.

Finally, it is important to acknowledge that of the 33 recessions the US has experienced since 1854, the US is currently experiencing its third longest period without experiencing a recession (CNBC, 2017). To break the record, the US has to be recession free past June 2019 (CNBC, 2017). However, the longer times goes on, greater are the chances of a recession occurring sooner rather than later (Keaney, 2017). What is also of worry, as will be discussed in-depth shortly, is the ability of the US, and other major economies, to deal with the recession/crisis ‘successfully’ through fiscal and monetary policy.

Responding to the Next Crisis

When the global economy faces another financial/economic crisis, it is unclear whether large Keynesian style government expenditures can be successfully implemented (Sharma, 2011). This will particularly be the case if the financial/economic crisis is debt induced. When there is a crisis in confidence in debt, it is hard to impossible to find new buyers willing to purchase debt at a reasonable interest rate (Skarica, 2014). For example, at one point during the Greek crisis in 2010, interest rates north of 10% for the 10-year bond were still not high enough to persuade investors to buy their debt (CNN, 2010). As a result, if governments try to spend large amounts during a debt crisis it will have to be purchased through newly created QE money in order to monetise the debt (Skarica, 2014). While possible, it will be highly inflationary (Skarica, 2014). As the economist Peter Schiff describes, giving someone who is drunk more alcohol makes the problem worse (CNBC, 2017).

Monetary policy, discussed in Chapter 4, has been extensively used in unorthodox and new ways in the post GFC era. On the whole, these policies can be considered as being broadly successful if measured in terms of its ability to generate economic growth as well as its ability to lower borrowing costs for governments. Going forward, the four key central banks could continue to implement more and larger monetary policies. However, monetary policy has a diminishing impact the more it is implemented (Skarica, 2014). Or in other words, monetary policies have to be more ambitious to achieve the same result as earlier policies. For example, cutting interest rates from 1% to 0% is going to have less of a stimulus impact than cutting rates from 7% to 6%. This is because most households and businesses would have already borrowed at 1%. Whereas a 1% cut when interest rates are high makes a big difference as to whether to buy a home or invest in new capital equipment etc. Additionally, QE policies also have diminishing returns with regard to stimulating economic growth (King, 2016). Looking

at the Federal Reserve's QE policies in relation to lowering bond yields, QE3 was less effective than QE2, which was less effective than QE1 (King, 2016).

As a result, as the world economy is in a quasi-liquidity trap, interest rates will have to be cut deep into negative territory to have a similar stimulus impact as the interest rate cuts made during the GFC (King, 2016). Additionally, QE policies alone may not be enough. Helicopter money very well may be implemented in the face of a future downturn. However, while inflation has been elusive in the post GFC era, there is the risk that even larger future monetary policies may be highly inflationary (Skarica, 2014). This point, which was discussed in the QE section of Chapter 4, is very important and needs to be restressed. As the quantitative theory of money explains, a rapid rise in the velocity of money through lost confidence in a currency's value would be highly inflationary thanks to the increased monetary base due to the QE policies implemented post GFC. Therefore central banks will have to be aware of the potential unintended consequences of even large monetary policies being implemented.

The last important point to make is that the next economic downturn could very well be unrelated to debt problems. As mentioned earlier, the 'snowflake' or black swan event could be a war, a global pandemic, etc. Thus, there is the possibility that governments will be able to respond to the crisis through fiscal expenditures and monetary easing policies like they did during the GFC. Expressed differently, financial markets may allow the US to have debt levels at \$30 trillion, meaning they could still borrow large amounts to help mitigate the next crisis. However, the larger the debt level, the more likely a debt crisis. Therefore if it's not the next economic downturn it could be the following crisis if debt levels continue to rise. As a result, regardless as to when the next debt crisis is, one day the US is going to face four paths to deal with its large debt level if the current trend of debt increase is not corrected.

Debt Super Cycle Theory

The four paths will be discussed in the following order. Growth path, austerity path, inflate away the debt and default on the debt.

Growth Path

As was discussed in Chapter 4, unorthodox monetary policy has been extensively used in order to generate economic growth in the aftermath of the worst economic downturn since the Great Depression. Growth is vital for debt serviceability. Looking at the debt to GDP ratio, if economic growth rates are greater than the growth of debt, the debt to GDP ratio declines even

if the overall level of debt continues to increase. Additionally, if economic growth rates are declining or even negative, debt to GDP ratios can rise even if debt levels remain constant. Therefore it is vital that economies continue to grow to ensure their debt levels remain serviceable.

As mentioned in Chapter 2, there are two ways in which an economy can grow. It can increase its population or increase its productivity per worker (El-Erian, 2016). Looking at the key countries that have been studied, on the whole, population growth is stubbornly low (United Nations, 2017). Fortunately for the US, when compared to the other six countries, it has the best long-term future population projections as can be seen in Figure 43 and Figure 44 (United Nations, 2017). This is in large part reflected in the fact that the US continues to be seen as a land of opportunity and, subsequently, a great place to immigrate to (The Wall Street Journal, 2016). Plus, as Figure 45 shows, of the seven countries studied, the US as of 2015 has the lowest median age, at 38 years (UN Data, 2017).

So, while the US long-term may be demographically secure from a population perspective, over the short- to medium-term it is not clear whether population growth will be strong. According to the Census Bureau, at an annual increase of 0.7%, 2016 was the slowest increase in population growth for the US since 1937 (The Wall Street Journal, 2016). The key contributor to this, according to the report, was an aging society who continue to have less and less kids (The Wall Street Journal, 2016). With regard to immigration, immigration numbers are just above historical average which is a positive (The New York Times, 2017). However, while unlikely to make a large negative dent to population growth, President Trump's anti-immigrant stance will, at a minimum, not encourage population growth (The New York Times, 2017).

For comparison to the US, Japan, Italy and Germany all have rapidly aging populations as can be seen in Figure 45 (United Nations, 2017). Without essential structural changes, such as encouraging more births and/or encouraging immigration, these populations are expected to decline (United Nations, 2017). The 2050 population forecast, outlined by the latest UN report, has a base case of Japan's population decreasing from its current 126 million population to 107.4 million (United Nations, 2017). Japan's population growth, which has been largely flat for the last three decades, is a key factor in explaining their 28 years of flat to subdued growth (The Washington Post, 2016). Going forward, the rapidly decreasing Japanese population is

going to be one of the economic problems, if not the biggest, facing Japan in the long-term (The Washington Post, 2016).

For Italy, the same report shows a base case decrease in population from its current 60 million to 56.5 million, while Germany, with its 83.6 million population, is expected to decline to 74.5 million by 2050 (United Nations, 2017). As Angela Merkle's controversial refugee immigration policy for Germany shows, these forecasts need to be considered carefully as policies can change future projections (The Atlantic, 2016). In saying this, collectively, with the exception of the US, long-term population growth for these seven countries is likely to be minimal, and in the case of Japan, very likely to decline (United Nations, 2017). This is good news for the US over the long-term with regard to their ability to continue to economically grow.

With large increases in population growth unlikely in the short to medium term, economic growth is going to have to come from greater increases in worker productivity. It is increasingly clear President Trump is becoming an ineffective leader in terms of passing key legislation. In the first eight months of his presidency, with the failure of repealing and replacing Obamacare, his administration has not passed a single major legislative law (CNN, 2017). As for when the House and Senate will draft and pass a tax reform and infrastructure bill, two key legislative pieces which would help improve productivity, it is in question and likely at the earliest will not reach the floor until late 2017 or early 2018 (CNN, 2017). This is due to the fact that the House and Senate are going to be occupied with more pressing concerns during the second half of 2017 (The New York Times, 2017). These include the ongoing Russian investigations, the passing of the 2018 budget, raising the debt ceiling past December and dealing with the funding for the recovery from Hurricane Harvey and Irma (The New York Times, 2017).

Additionally, with President Trump distracted by the ongoing Russian investigations, North Korean provocations, his continuing fight with key Republican leaders, such as Senate majority leader Bob Corker, Mitch McConnell, John McCain, Jeff Flake etc., and now having to deal with the aftermath of Hurricane Harvey, Irma and Maria, it's not clear how much time and energy President Trump will have to implement his key legislative agenda, at least for the next four to six months (The New York Times, 2017). Furthermore, with American politics currently being incredibly divisive and for the fact that the Republican Senate has a very narrow 52 seat majority, the ability for the Senate to pass a purely partisan bill is tight. This was seen with the recent health care bill failure (United States Senate, 2017). So with a distracted

President and a congress that is politically divided, passing key legislation that will improve productivity is going to be difficult in the years ahead.

The one promising legislative law that likely will be passed at some stage will be an infrastructure bill, as there is broad bi-partisan agreement that America must invest in more infrastructure (CNN, 2017). This is because, according to the American Society of Civil Engineers (2017), the US infrastructure grade is D+. An infrastructure bill needed to just get the US a B- grade would create millions of jobs and would over time greatly improve the productivity of transportation by lowering costs (CNN, 2017). Also, improved transportation would increase everyday citizens' productivity potential by reducing the number of hours they spend stuck in traffic annually (Bloomberg, 2017).

In addition to transportation, other very important infrastructure components, such as improving the power grid, airports, drinking water, etc., will lead to greater levels of productivity for the US economy (Bloomberg, 2017). President Trump has called for a trillion-dollar infrastructure bill (CNN, 2017). In reality, an infrastructure bill that has a chance of getting through both houses of congress will be in the hundreds of billions (Bloomberg, 2017). Regardless, ignoring the fact that an infrastructure bill will lead to increased levels of sovereign debt, it is long overdue and would help the US economy achieve long-term productivity gains (Kristijan, et al., 2016).

One key notable area of productivity potential that the Trump administration appears to be sabotaging is education. Although congressional approval is required, President Trump's proposed 2018 budget calls for a \$9.2 billion, or 13.5% cut in the education department's budget (The Washington Post, 2017). Additionally, President Trump's budget proposal included cutting student debt interest subsidies, which is only going to make higher education more expensive and out of reach for the poor and lower middle-classes (CNBC, 2017). In an increasingly competitive world that requires higher education to be successful, particularly in the science, technology, engineer and mathematic (STEM) subjects, cutting the education budget is arguably incredibly short-sighted and will not improve workers' productivity over the long-term (ROSS, 2016).

The future economy is going to be centred around industries such as artificial intelligence, robotics, nano-technology, coding etc. (Ross, 2016; Keely, 2017). Therefore having an educated population with the necessary skills required to be successful in these future industries is imperative in order to be successful and productive over the long-term (Ross, 2016; Keely,

2017). Cutting the education budget is going to be counterproductive to achieving long-term productivity gains. While short- to medium-term productivity may not be impacted, without question long-term worker productivity will be if education investments in the American population are not made (Ross, 2016).

Lastly, when looking at productivity, it is also important to consider the new innovations and inventions that are being created instead of only policies. These include driverless cars, artificial intelligence, robotics, 3-D printing, cheaper renewable energy, new advanced materials, nano-technology, bio-technology, etc. (Ross, 2016; Keely, 2017). All of these fields, over the long run, have great promise in increasing workers' productivity (Ross, 2016; Keely, 2017). Many prominent individuals and thinkers, such as Ray Kurzweil, Alec Ross and Kevin Kelly, feel we are at the cusp of the fourth industrial revolution (Ross, 2016; Keely, 2017). The problem is the majority of these technologies are still in their very early stages of potential usefulness, similar to where the internet was in the late 1990s (Keely, 2017).

Therefore the massive gains in productivity that need to occur within the next 5–10 years to avoid a debt crisis are likely, instead, to be realised in the next 10–20 years, which will likely be too late to avoid a debt crisis (Keely, 2017). Furthermore, many prominent individuals feel that the disruptiveness of these new technologies will lead to mass joblessness in the medium-term as it will take considerable time for truck drivers, manufacturing workers, agricultural workers etc. to retrain themselves for new industries (Ross, 2016). Therefore the argument is that as there will be large temporary unemployment, productivity per worker will be subdued until the majority of the workforce has been retrained with the necessary skills to be productive in the new future economy (Ross, 2016). While this may be a grim short- to medium-term outlook, the good news is that in the long-term the future recovery from a debt crisis should be very bright in which standards of living will be far greater than they are today globally (Ross, 2016; Keely, 2017). However, the issue of excessive indebtedness will first have to be addressed by all the key countries.

If the growth path is to be obtainable, realistically the US needs to grow at a rate of 3–4% for the next 10 years while also running budget surpluses over this time. At the minimum, assuming growth rates in the 3–4% range, budget deficits at 1–2% maximum can be run, as although the total debt will continue to increase, the debt to GDP ratio will decrease as the rate of growth is greater than the growth of debt. As shown in Figure 12, growth rates in the US in the last 10 years after the GFC have been averaging 2% (World Bank, 2017). More recently,

the latest growth rate for the second quarter of 2017 was 3%, which is positive (CNBC, 2017). However, as discussed in Chapter 3, it is very improbable an average growth rate of 3% for the next 10 years can be achieved as President Trump's budget assumes. Especially as large productivity improving legislation has time delays and therefore is likely to be elusive over the medium term.

Finally, as was discussed in Chapter 4, the unorthodox monetary policies that have been implemented in the post GFC era have on the whole been successful in generating economic growth in the aftermath of the worst economic downturn in 80 years. However, as was discussed in the last section, monetary policy decreases in effectiveness the more it is implemented. As a result, it is extremely unlikely even larger and bolder monetary policy will generate real economic output. Put differently, now 10 years after the GFC, the access and cost of obtaining a mortgage or business loan is having negatable impact on potential future economic growth.

As the highly respected political scientists, and head of the American Council of Foreign Affairs's Richard Haass explains, the debt situation, like global warming, is a slow-motion crisis that lacks the urgency to address the problem until it ultimately is too late (Haass, 2017). As just discussed, there does not seem to be the political will, and/or the ability of the US to obtain high levels of GDP growth for a substantial period of time in the near to medium term. Therefore it is unrealistic and very unlikely that the US will be able to grow their way out of their current debt position. As a result, one of the other three options with dealing with debt servicing will likely have to be used.

Austerity Path

As discussed in Chapter 2, austerity is simply cutting back public expenditure or raising taxes in order to balance the budget (Bergsten, 2009). If done aggressively, it entails running budget surpluses to pay down the principle debt which has not been achieved since 2000 (US Government debt, 2017). The US government can willingly choose to go down this path if the fiscally conservative republicans in the freedom caucus can dictate future budgets (King, 2016). As the 2013 government shutdown showed, the freedom caucus can have major influence (The Atlantic, 2013). While a future government shutdown cannot be ruled out, more likely than not it will be short-term, as self-inflicted austerity is not politically popular as voters do not like taxes being raised, Social Security cut, unemployment benefits slashed, etc. (King, 2016).

More likely, what will force governments to go down this path is when the bond markets force governments to do so thanks to the Bond Vigilantes (El-Erian, 2016). As discussed in Chapter 4, a large reason why debt has been serviceable is due to ZIRP, NIRP and QE policies. This has ultimately led to one of the strongest global bond market rallies in history with global yields at the lowest they have ever been for most countries, making it incredibly cheap for governments to borrow (Kristijan et al., 2016). However, if prime interest rates rise, as they are slowly starting to in the US, there is the real risk that the interest payment expense will significantly increase (The Telegraph, 2017).

Rapidly rising interest rates are by no means a threat voiced by permafrost bearish market commentators. Alan Greenspan, ex head of the Federal Reserve, in an August 2017 interview is quoted saying,

By any measure, real long-term interest rates are much too low and therefore unsustainable. When they move higher they are likely to move reasonably fast. We are experiencing a bubble, not in stock prices but in bond prices. This is not discounted in the marketplace (Bloomberg, 2017, Para. 2).

Alan Greenspan went on to explain that,

The real problem is that when the bond-market bubble collapses, long-term interest rates will rise. We are moving into a different phase of the economy — to a stagflation not seen since the 1970s. That is not good for asset prices (Bloomberg, 2017, Para. 4).

In 2016 while refraining from giving a timeline, famed bond investor Bill Gross tweeted, “Global yields lowest in 500 years of recorded history ... This is a supernova that will explode one day” (Financial Times, 2016, Para. 1). Renowned economist Nouriel Roubini, who is widely credited in predicting the 2008 GFC in great detail, has warned the problem is a “liquidity time bomb” (CNBC, 2015). Finally, the global economic advisory group, The Lindsey Group, who are known for being a non-subjective entity, in a 2016 report said when referring to the global bond market, “We’re in an epic bubble of colossal proportions” (CNBC, 2016). Dozens of similar warnings can be found by other prominent individuals and groups.

The main point being that rapidly rising interest rates, thanks to Bond Vigilantes, should not be treated as a one in a hundred-year event, particularly due to the very large sovereign debt base (Mitry et al., 2012). What is not clear is whether the Bond Vigilantes will warn

governments like they did with Bill Clinton in 1994 or whether they will outright punish them like they did Spain and Italy in recent years. In saying this, either way governments will have to make tough choices about how to get their fiscal budget in order, assuming they do not want to default or inflate their way out of debt.

Rapidly rising interest rates will finally prevent governments from kicking the can down the road, as they have been doing for decades, and force them to make tough budgetary decisions. Looking at the US, this will require either significant tax increases, deep budget cuts, the selling of assets, and/or a combination of the three. All three options in different ways are painful. Realistically, to restore confidence in the bond market and hence ensure debt interest rates stay low and manageable, sustained budget surplus in the 1–4% range will be needed over the medium- to long-term (El-Erian, 2016).

Discussed in Chapter 3, on the expenditure side, this will mean budget cuts will have to be made to the three biggest expenses. These are healthcare, social security/welfare and military expenditure which collectively make up approximately 75% of the entire budget (National Priorities, 2016). Cuts to any of these areas will be politically unpopular no matter how they find ways to cut expenditure. If they decided to cut food stamps, or at least reduce the amount of food it provides to 41,310,785 million Americans as of June 2017, they will be left worse off (USDA, 2017). If they decided to reduce the social security cheque, that is going to hurt the 66.56 million Americans as of June 2017 who receive funds from this programme, many of who live pay cheque to pay cheque (Social Security, 2017).

If Congress repeals Obamacare and chooses not to replace it, according to the Congressional Budget Office (CBO), 32 million people by 2026 will lose healthcare insurance (CNBC, 2017). As far as the saving repealing Obamacare would save the taxpayer, this would only amount to \$473 billion over a 10-year period. While this helps, it is small considering the total deficit is \$20 trillion (CNBC, 2017). Finally, possibly deep cuts to the military could be found. However, to what extent could military cuts be achieved before national security, in the eyes of the American hawks, is compromised and thus they reject proposed cuts (Haass, 2017). As can be seen, there are no cost-free choices.

Looking at the tax side, there are a variety of ways in which increases in tax revenue could be found. For a start, there are nearly 200 tax loopholes, subsidies and deductions that predominantly the rich take advantage of (Pew Research, 2016). Closing loopholes and reducing the amount of deductions and subsidies offered would provide a great increase in tax

revenue. While some deductibles arguably should remain, such as child care subsidies, a large number, such as negative gearing tax deductions, should be reviewed (Pew Research, 2016). According to the US Treasury, these tax breaks amount to over \$1.3 trillion annually (Pew Research, 2016).

Very rich individuals like Warren Buffett have strongly criticised these tax breaks. In a 2011 opinion piece, Warren Buffett said,

Last year my federal tax bill — the income tax I paid, as well as payroll taxes paid by me and on my behalf — was \$6,938,744. That sounds like a lot of money. But what I paid was only 17.4 percent of my taxable income — and that’s actually a lower percentage than was paid by any of the other 20 people in our office. Their tax burdens ranged from 33 percent to 41 percent and averaged 36 percent. (The New York Times, 2011, Para. 4).

As a result, if and when the government is backed against the wall, there is potentially a sizeable amount of tax that could be generated from the top 0.1% of Americans (El-Eiran, 2016). Likely, this option will be far more politically obtainable than targeting the majority of Americans with tax increases.

One area where the American taxpayers were open to being taxed more is a fuel tax (Bloomberg, 2017). According to a 2017 Bloomberg survey, 55% of Americans were open to a fuel tax as long as the tax was to be solely allocated towards infrastructure expenditure (Bloomberg, 2017). At 18.4 cents a gallon for gasoline and 24.4 cents for a gallon of diesel, increasing the fuel tax makes a lot of sense and hopefully also dollars, particularly as fuel prices are historically low and the fuel tax was last reviewed in 1993 (Bloomberg, 2017). While raising the fuel tax is not a magic bullet, it could greatly help pay for badly needed infrastructure expenditure (Bloomberg, 2017). Other similar excise taxes on items such as alcohol, cigarettes, CO2 emissions etc. could also be potentially reviewed (Bloomberg, 2017).

Another major area of tax that has to be addressed is the cooperation tax. As of late 2016, there was over \$2.5 trillion in untaxed income parked overseas (CNBC, 2016). Donald Trump has talked about a onetime reduced tax rate if corporations repatriate foreign income which could be smart policy to increase tax revenue (CNBC, 2016). Going forward, ways to discourage companies in the first place from this practice need to be addressed (CNBC, 2016). Looking at individual income tax, while it is relatively high for OECD nations, introducing a millionaire

tax at say 50% or higher could be looked at. Steve Bannon, one of Donald Trump's ex-closest advisors, had proposed a 44% tax rate on high income individuals earning \$5 million (Bloomberg, 2017). However, as of time of writing it does not appear that the Trump Administration will follow through with this idea.

Unlike most OECD countries, the US does not have a federal goods and service tax (GST) (El-Erian, 2016). Again, this is something that should be considered when the need to increase tax revenue becomes apparent. Overall, like expenditure cuts, there is no free lunch. However, considering the income inequality in America is the worst in the OECD, going after the ultra-wealthy may be a socially optimum way to address the debt crisis (El-Erian, 2016). Illustrating this point clearly, the four wealthiest American families, as of 2017, are worth more than the bottom 40% of American citizens (Huffington Post, 2017). As a result, targeting individuals like this seems to be the logical path going forward.

The last important path of austerity that can be explored is the selling of federal assets. If there is a magic bullet for the US debt situation it is that they own a vast array of assets. A 2013 report found the federal government owns over 900,000 buildings (Institute for Energy Research, 2013). These buildings are used for housing government departments such as the FBI, NASA, IRS, EPA, etc. (Institute for Energy Research, 2013). A 2009 federal agency study found 45,190 federal buildings were being underutilised (Institute for Energy Research, 2013). While it is hard to know where this number stands in 2017, as it was a one-off study, no doubt there would be tens of thousands of federal buildings that could be sold to generate revenue today.

Looking at land ownership, as of 2013, the Federal government owns 755 million acres of onshore subsurface mineral estate and 1.76 billion acres of offshore lands for mineral estate (Institute for Energy Research, 2013). Excluding the environmental concerns, selling mineral rich federal land to oil and mining companies on a large scale would generate a sizable amount of revenue. The latest report by the Energy Information Administration (2016) estimates the US proven oil and natural gas reserves stand at 35.2 billion barrels, 324.3 billion cubic feet, respectively. Even with oil prices in the \$40–60 range and natural gas trading around \$3–4 dollars per one thousand cubic foot, this amount of proven reserves is worth trillions of dollars. Therefore if the federal government was willing to sell land where there is proven oil and gas reserves, potentially this could help reduce the government's debt burden.

To conclude this subsection, it is important to stress that tough austerity measures by definition are painful. The best country that could be used as a case study of the impact of austerity is Greece. In the last seven years, standards of living have decreased by 26% as measured by GDP per capita (World Bank, 2017). Unemployment at its peak was 28% and has only modestly improved to the current level of 23% (World Bank, 2017). Greek pensions have been cut 15–20% (Reuters, 2017). Average government salaries have decreased 14.6% between 2010 and 2015 (Eurofound, 2016). Disappointing for Greece is that due to their GDP decreasing to the extent that it has, despite paying off a sizable amount of debt, their debt to GDP ratio has actually increased from 170% in 2010 to 179% in 2017. This is true economic hell (World Bank, 2017). While the economic pain Greece has experienced is extreme, it cannot be ruled out that the US and some of the six countries studied may one day similarly find themselves in this situation. Even experiencing half of the economic pain Greece has experienced would be dire. Subsequently, the problem of excessive debt should not be taken lightly by elected leaders.

Inflate Away the Debt

The US, under two different market scenarios, can voluntarily choose to inflate the debt away. Firstly, if the Bond Vigilantes revolt by pushing up the cost of borrowing, as was described in the last section, inflation will rise (King, 2016). The choice the government and the Fed need to make in this scenario is whether to put the economy into a recession/depression by raising prime interest rates and implementing austerity, or whether to allow inflation to rise due to a self-reinforcing feedback loop (El-Erian, 2016). As was discussed in Chapter 4, this will be due to the rise in velocity of money as holders of fiat money become concerned the future value will be noticeably less. Additionally, inflation rates will likely accelerate higher if the government/Fed decide/need to monetise newly created debt with QE money (King, 2016).

The common analogy is that once the inflation genie is out of the bottle, it is very hard to put it back in (Skarica, 2014). Therefore this path can easily be disorderly, and subsequently very hard to manage, as inflation rates quickly spiral to uncomfortably high rates bordering on hyperinflationary (Skarica, 2014). This is particularly true if the Fed is too late to intervene to slow down inflation (Skarica, 2014). The way to clamp down on inflation is through moral persuasion, raising prime interest rates and/or reducing the money supply. The problem is that the higher inflation gets, the more aggressive the Fed will have to be to get inflation back in

line (Skarica, 2014). Therefore letting inflation rise before clamping down is a policy that could be very hard to implement and control if the Fed is behind the curve (Skarica, 2014).

The second scenario would include the US Government and the Fed choosing to engineer inflation in the face of deflation (El-Erian, 2016). As outlined in Chapter 2, both the Debt Deflation Theory and the Financial Instability Hypothesis explain how excessive levels of debt can lead to a deflation trap/spiral. This, of course, makes the real value of debt worse (King, 2016). Therefore, thanks to the lessons hopefully learned from the Great Depression in the 1930s, the government and the Fed will try and engineer inflation to avoid a depression (Bergsten, 2009).

Unlike the first scenario, the government and Fed are trying to engineer inflation instead of managing inflation (Skarica, 2014). Or in other words, they are being proactive instead of reactive. Therefore, through the use of manipulating interest rates and the size of QE policies in a surgical manner, the Fed will have a better chance of being able to achieve a range of inflation that is in the sweet spot. For central banks trying to inflate away debt, the ideal rate of inflation is in the 3–5% range (Skarica, 2014). This is because it is better to slowly over time inflate the debt away instead of trying to do it all at once (Skarica, 2014). If done slowly enough, markets and households will not immediately notice that inflation is eroding the value of the fiat US dollar, and subsequently its purchasing power (Carbaugh et al., 2008). Even if they do notice, as long as the market consensus is that inflation will not rise higher thanks to the credibility and strong statements of moral persuasion made by the government and the Federal Reserve, households and businesses will not rush to spend money as soon as it is earned (Carbaugh et al., 2008). This will keep the velocity of money in check and hence inflation in check (Carbaugh et al., 2008).

However, if the Fed engineers inflation rates that are too high, say in the 10–15% range, there is the real risk that the government and Fed will lose its credibility to control inflation (Kristijan et al., 2016). This will subsequently lead to a rapid rise in the velocity of money as individuals lose faith in the value and purchasing power of the fiat US dollar (Kristijan et al., 2016). An analogy is that it's like an employee who is more likely to go unnoticed stealing a couple of dollars at a time from a till as opposed to stealing \$50 at once. Therefore both the US and the Fed have to ensure they keep inflation at moderate rates in order to ensure confidence in the US dollar as a store of value, and hence its ability to function as a reserve currency, is not lost (El-Erian, 2016).

As the late famous economist Friedrich Hayek said, “I do not think it is an exaggeration to say history is largely a history of inflation, usually inflation’s engineered by governments for the gain of governments” (Brainyquote, 2017, Para. 1). Therefore, assuming inflation can persistently remain in the 3–5% range, plus assuming the growth in budget deficits is less than the rate of inflation, the real value of debt will decrease, which is a positive development for the US Government. Numerically an inflation rate of 4% over 10 years will erode the value of the dollar by 48%. Put differently, if the \$20 trillion dollar debt was to remain constant nominally for 10 years, in real terms it would be worth \$13.5 trillion in today’s dollars. This, of course, would be fantastic for the US government if it could engineer this.

It’s important to re-stress what was noted earlier in this chapter that as monetary policy has already been excessively used the Fed is going to have to be careful when trying to engineer inflation as markets may react in ways the Fed does not intend, such as the reaction to the ‘Taper Tantrum’ speech (El-Erian, 2016). In saying this, if the government and the Fed can achieve a moderate rate of inflation without the markets losing confidence in the dollar’s value, then this is an attractive and credible way for the US to service its debt (El-Erian, 2016). However, it needs to be restressed that this is easier said than done, as inflation can quickly get out of hand if credibility is lost (King, 2016).

Default

The US defaulting on their debt is the least likely painful option of the three that would be implemented by the government. This is due to the fact that the loss in confidence and damage to the economy and the US dollar would be a dire self-inflicted wound that likely would make economic and financial problems far worse than the original debt crisis. In a 2011 letter to Congress, Treasury Secretary Timothy Geithner outlined the consequences and repercussions of such policy. In his letter, he made four key points:

- (1) Defaulting on legal obligations would cause “catastrophic damage to the economy, potentially much more harmful than the effects of the financial crisis of 2008 and 2009” (US Department of the Treasury, 2011).
- (2) Default would place a considerable tax on Americas as all forms of borrowing would see their costs increase as the benchmark treasuring borrowing rate would markedly rise (US Department of the Treasury, 2011). In Geithner’s words, “Interest rates for state and local government, corporate and consumer borrowing, including home mortgage interest, would all rise sharply. Equity prices and home values would decline,

reducing retirement savings and hurting the economic security of all Americans, leading to reductions in spending and investment, which would cause job losses and business failures on a significant scale” (US Department of the Treasury, 2011, Para. 3).

(3) Geithner said, “Default would have prolonged and far-reaching negative consequences on the safe-haven status of Treasuries and the dollar’s dominant role in the international financial system, causing further increases in interest rates and reducing the willingness of investors here and around the world to invest in the US” (US Department of the Treasury, 2011, Para, 4).

(4) Finally, Geithner listed key groups that would be adversely impacted by a default. These include “U.S. military salaries and retirement benefits; Social Security and Medicare benefits; veterans’ benefits; federal civil service salaries and retirement benefits; individual and corporate tax refunds; unemployment benefits to states; defence vendor payments; interest and principal payments on Treasury bonds and other securities; student loan payments; Medicaid payments to states; and payments necessary to keep government facilities open” (US Department of the Treasury, 2011, Para. 5).

In his summary, Geithner went on to say, “any default on the legal debt obligations of the US is unthinkable and must be avoided” (US Department of the Treasury, 2011, Para. 7). Additionally, he added,

Throughout our history, that confidence has made U.S. Government bonds among the best and safest investments available and has allowed us to borrow at very low rates. Failure to increase the debt limit in a timely manner would threaten this position and compromise America’s creditworthiness in the eyes of the world. Given the gravity of the challenges facing the U.S. and world economies, the world’s confidence in our creditworthiness is even more critical today (US Department of the Treasury, 2011, Para. 9).

All four points, as well as his concluding remarks, clearly outline the negative consequences the US would face if it defaulted on its debt. What makes the US defaulting on its debt even more unlikely is that austerity measures and inflating the debt problem away are far better options to pursue when trying to service the debt. This is because, while confidence in the dollar potentially can be lost with these two options, it is not guaranteed if the government and Fed can maintain economic control, whereas a default would all but certainly lead to a complete

loss in confidence of the US dollar as a reserve currency in a short amount of time. Therefore the only rationale for the US Government to default on their debt is if they are already in a dire economic/financial position where confidence in the US dollar has already been lost.

The final important point is that there potentially is the option for the US Government to default on a sub ownership group of US debt. As outlined in Chapter 3, the broad breakdown of sub ownership of US debt can be divided by foreign ownership of US debt standing at approximately \$6.2 trillion, private ownership \$5.5 trillion, intergovernmental office ownership stands at \$5.4 trillion and finally the Fed owning approximately \$2.5 trillion (Federal Reserve, 2017; US Department of Treasury, 2017). In the realm of speculation, potentially, in some capacity, defaulting on the debt owned by the intergovernmental agencies and the Fed could be implemented without markets completely losing confidence in the US dollar. However, again this is just speculation.

Summed up succinctly, the US Treasury Secretary at the time, Jack Lew, in a letter to congress during the 2013 government shutdown outlined,

Any plan to prioritize some payments over others is simply default by another name. The US should never have to choose, for example, whether to pay Social Security to seniors, pay benefits to our veterans, or make payments to state and local jurisdictions and health care providers under Medicare and Medicaid. There is no way of knowing the damage any prioritization plan would have on our economy and financial markets (US Department of the Treasury, 2013, Para. 5).

In conclusion, the US defaulting on their debt would truly be a very large black swan event that hopefully will never transpire as it would be a certain death to the fiat US dollar in its role as a reserve currency.

Impact on the US dollar's Role as a Reserve Currency

As was alluded to earlier in this chapter, large additional fiscal policies implemented in the future have the very real potential to lead to a loss in confidence in the US dollar's ability to act as a reserve currency. This is because markets, worried about the government's ability to repay its future debt, will not want to own US dollars, as the value and purchasing power of the fiat dollar will be placed in question. Therefore a multi trillion-dollar fiscal stimulus package, similar to what was implemented during the GFC, may not be implementable as the markets will not allow the US government to continue to borrow. In this case, the US dollar

will lose its ability to function as a reserve currency. With this in mind, the government will be forced to consider one of the following four options to deal with their debt.

The first option of growing out of the debt is obviously the most preferable option when trying to address and service the debt. This is because the US will be able to continue to enjoy the high standards of living they have grown accustomed to without having to make cuts to living standards to address the debt problem. However, it is also the hardest of the four options when dealing with debt to implement. For argument's sake, if the US was able to generate growth in the 3–4% range over the medium to long-term, as well as also assuming budget surpluses in the 3–5% of GDP are achievable for multiple consecutive years, then there is a very strong chance the US dollar's role as the reserve currency will survive. If anything, under the conditions described above, the US dollar's role as the reserve currency would likely strengthen. Again, this is hypothetical.

The second option of deep austerity without question will be very painful to the US, and indeed globally, as Greece has shown. In short, it would be akin to another global Great Depression or at a minimum another GFC. If the US does go down this path, and does not pursue a path of defaulting and/or excessively inflating away the debt problem, it is likely the US dollar's role as the global reserve currency will remain strong. As the 2008 GFC crisis showed, despite the GFC starting from problems with US subprime mortgages, the US dollar strongly appreciated in value. This was due to the fact that the US during the crisis was seen as the ultimate safe haven currency. Or, as other market commentators quip, the US is the tallest midget, the cleanest shirt in the dirty basket, the prettiest girl in the brothel, etc. Therefore if the US chooses a path of austerity to address its debt problem, it is highly likely markets will continue to trust and view the US dollar as the ultimate safe haven and subsequently its ability to be the key global reserve currency.

If the US decided to inflate their way out of debt, as was discussed, the value, and subsequently its role as a reserve currency, depends on the rate of inflation. If inflation remains modest and not too high, confidence in the US dollar's ability to be a store of value will likely remain, even if it's not as strong as it used to be. However, if inflation is too high, there is the risk that there will be a run on the US dollar, making it unable to provide the role of being the key reserve currency. As discussed in Chapter 1, when inflation in the US during the late 1970s was in the 10–12% range, there was real concern among market participants that the fiat US dollar was incapable of being an effective store of value as evidenced by the rapid rise in gold prices. As

a result, the higher rates of inflation that transpire, the greater the risk that markets will stop accepting the US dollar as a store of value and hence its ability to function as a reserve currency. Finally, as was discussed, the US government defaulting on their debt would all but certainly lead to the US dollar being unable to function as a key reserve currency.

Conclusion

In conclusion, there will be another economic/financial crisis. While it may not be directly caused from excess debt levels, responding to it with similar fiscal and monetary policies as those implemented during the GFC are going to bring the problems of excessive indebtedness to the forefront. In other words, governments cannot continue to keep kicking the can down the road indefinitely as they will eventually have to deal with excessive indebtedness if debt levels continue to increase. As a result, if and when the US finds itself in this situation, the ability of the US dollar in its fiat form to continue to act as the global reserve currency will depend on which of the four paths the US chooses to address their debt problem.

The last important area of this thesis to study, in order to determine whether the US dollar will remain the key global reserve currency, is to study what currencies may become popular and widely acceptable as a reserve currency in the future. World trade will not stop if the US dollar ceases to function as the key sole global reserve currency. Consequently, if the US dollar can no longer act as the key reserve currency, another currency will have to take its place. In saying this, the US has the ability to transform the fiat US dollar towards an intrinsically backed currency. Such a move could shore up confidence in the US dollar's ability to act as a reserve currency even if it experiences a full-on sovereign debt crisis; therefore it is also important to explore this option. As a result, before a conclusion can be deliberated as to what degree the US dollar is in jeopardy of not being able to continue to facilitate the role of being the key global reserve currency, it is vital to study the rise of future currencies and the options the US has to transform the US dollar.

Chapter 6: The Rise of Potential Future Reserve Currencies

The last important aspect of the thesis to study and explore is the future potential global reserve systems that have the possibility of replacing the US dollar's role as the current key global reserve currency. From a broad view perspective, as to what is considered money, four factors have to be present for an asset to be considered a currency. These include being a medium of exchange, a store of value, a unit of account, and a standard of deferred payment (debt ownership/repayment). With these four factors that characterised what is money in consideration, the following financial assets will be studied. These include other key established global currencies, the Chinese yuan, SDRs, gold backed currencies and cyber currencies.

Other Currencies

When considering other key potential currency replacements for substituting the USD's role as a reserve currency as of today, the list would be short. Specifically, they would only include the euro, yen, pound and, to a far smaller degree, a couple of other influential global currencies such as the Swiss franc, Canadian dollar, Australian dollar, and the South Korean won. Finally, it's important to mention the Russian-led actions to create a currency across its Eurasian Economic Union (EEU) to rival the euro need to be considered.

As was shown in Chapter 1, the euro, being the second largest global currency used as a reserve, only makes up 19.7% of total reserves (IMF, 2017). With this percentage it is very unlikely the euro will get close to replacing the US dollar's 64% anytime soon (IMF, 2017). This is particularly due to the fact the eurozone collectively is in an equally, if not worse, sovereign debt position as the US. Plus, economically the eurozone compared to the US in the post GFC collectively struggles with higher levels of unemployment, lower growth rates, and worse demographic trends (King, 2016). Therefore it is hard to see the euro being able to supersede the US dollar as the sole key global reserve currency (Costigan et al., 2017).

Looking at the yen and the pound, with Japan's demographic problems and record high levels of debt, and the United Kingdom's Brexit escapade, it is not very likely these two currencies will come to pose a threat to the US role as the sole key reserve currency (Prasad, 2016). It is very important to note, while not a threat to the US dollar's dominance, the euro, yen and pound will for decades to come remain very important global currencies and will still act as minor reserve currencies as they do today (Gupta, 2014). Studying the other middle tier currencies listed above, none could meaningfully replace the USD's role as the global reserve currency

simply due to their home economies being far too small as a percentage of global trade (Gupta, 2014). This is not to say these currencies could not grow in global influence and importance. They, at best, could rival currencies like the yen and pound in the distant future but not the US dollar (Costiganm et al., 2017).

Finally, one important development that could one day provide a challenge to the US dollar is the creation of a common currency in the EEU. The EEU is a Russian-led trading bloc that includes Armenia, Belarus, Kazakhstan and Kyrgyzstan (The Diplomat, 2014). They have expressed interest in forming a common currency, particularly after the GFC (The Diplomat, 2014). The strongest and most promising expression of this came from both Russia's First Deputy Prime Minister Igor Shuvalov and Russia's President Vladimir Putin. At the July 2014 EEU summit Igor Shuvalov said,

The issue of a common currency will certainly be solved in five to ten years; there will be issuing centres and there will be a common currency. We could have avoided this if we had not broken the ruble when the Soviet Union collapsed. We wrecked our common economic space and now, being independent states, we are creating such space again (TASS, 2014, Para. 5).

A year later at a conference when asked about the EEU, Vladimir Putin said, "The time has come to start thinking about forming a currency union." (The Independent, 2015, Para. 9).

It is too early to know if the EEU currency will have any meaningful impact on the US dollar. If a country like Iran, India, Turkey, Brazil, South Africa, etc. became members, the calculus would change (Blackwill, & Harris, 2016). Additionally, as will be discussed later in this chapter, it cannot be ruled out that Russia and China could form some type of joint currency in the future. A final point on Russia is that their oil dependent economy is a handcuff to the ruble, or other Russian backed currency, from gaining increased global influence (Rickards, 2016). However, if backed by gold, discussed later in this chapter, this calculus could change. What can be said is Russia does not try and hide their intentions to create a rival currency to the US dollar.

Overall, looking at all the other key globally reaching currencies, none look like they will come close to pressuring the US dollar's role as the leading global reserve currency now or in the foreseeable future (Pop, 2016). Discussed in Chapter 3, this is particularly evident due to the home economies of the eurozone, Japan and the United Kingdom all suffering from sovereign

debt problems. This does not mean that these currencies will not be relevant in the future and nor does it mean that they cannot act as minor reserve currencies as they currently do (Pop, 2016). Additionally, it will be important to continue to study Russia's future currency ambitions. But, as of today, and over the medium term, it is of no threat. While none of the above are likely to replace the US dollar, there is one currency, namely the Chinese yuan, that potentially is capable of one day dethroning the US dollar's role as the sole key global reserve currency.

Chinese Yuan

Due to the phenomenal economic growth that China has experienced over the last three decades, they have, over time, become economically powerful to the extent that they now are starting to conduct a sizeable amount of bilateral trade denominated in yuan instead of US dollars. Additionally, China is increasingly becoming a global economic superpower that is competing with the US hegemonically. Both facets will be discussed as they are important in determining if the yuan could one day challenge the US dollar as a key reserve currency.

Yuan Denominated Bilateral Trade

In December 2011 China and Japan agreed to trade directly yuan for yen and vice-versa when trading with each other (Bloomberg, 2011). This agreement between historical rivals makes economic sense for the second and third largest global economies (Bloomberg, 2011). As part of the announcement, the Japanese Finance Minister Jun Azumi said, "By conducting transactions without using the third country's currency, it will bring merits of reducing transaction costs and lowering risks involved in settlements at financial institutions" (Reuters, 2012, Para. 3). While the majority of trade between these two countries is still in US dollars due to the yuan not being fully convertible, it is still significant that these two countries are willing to trade with each other rather than use the US dollar (Bloomberg, 2011). Going forward, as the yuan becomes more convertible, trade between these two countries not using the US dollar will likely increase simply due to the massive economic savings that can be achieved (Reuters, 2012).

Shortly after the trade agreement was reached between China and Japan, China started to trade with Iran in 2012 in yuan (BBC, 2012). This was in large part due to the fact that China relies on Iranian oil and the US had shut Iran from trading in US dollars as part of economic sanctions over their nuclear programme (BBC, 2012). As a side note, Iran, in response to President

Trump's Muslim travel ban, has called for eventually stopping all their foreign trade in US dollars (Forbes, 2017). Subsequently, going forward, while they have announced a preference for euros, it is likely Iran will also increase their trade in yuan when trading directly with China.

In addition to trading yuan for Iran's oil, similar deals and transactions have been reached with the United Arab Emirates and Qatar for their oil and natural gas in recent years (CNBC, 2017). Since the 2015 opening of a Chinese clearing house in Qatar, 590 billion yuan (US\$86 billion) worth of transactions has taken place with these countries as of April 2017 (CNBC, 2017). Although the majority of total oil and gas transactions between China and these nations is still financed in US dollars, there is growing acceptance and a willingness from these Middle Eastern nations to trade more in yuan (CNBC, 2017). On this subject, the head of the Chinese clearing house in Doha said, "As the trade volume between China and the region continues to grow in a rapid pace, we are looking forward to seeing more and more usage of RMB in the region" (CNBC, 2017, Para. 5). While China trading yuan for Middle Eastern oil is growing, the most important yuan oil trade, and indeed yuan denominated trading in general, is with Russia.

In the aftermath of the GFC, and particularly after the Russian-Ukrainian crisis, it is evident that Russia and China have formed a strategic partnership with the intention of delegitimising and weakening the hegemony of the US dollar's global role (The Diplomat, 2016). This has been seen in a variety of ways, including through closer economic integration. China, for a long time, has purchased oil and natural gas from Russia (Bloomberg, 2013). However, there has been two major deals that have been reached between each nation in recent years that are unprecedented in size. The first was a 25-year \$270 billion oil deal agreed to on June 2013 (Bloomberg, 2013). The second was a 30-year \$400 billion natural gas deal that was agreed to in May 2014 (The New York Times, 2014). What is particularly significant with these deals is that China is paying Russia in yuan (The New York Times, 2014).

Oil is not the only good that Russia and China trade with each other in yuan. Since 2014, Russia and China have agreed to conduct currency swaps with each other (CNBC, 2017). In total 815 billion rubles and 150 billion yuan so far have been swapped, which allows each country to purchase goods from each other (CNBC, 2017). While this is a large amount of currency that has been traded between each country, it is not large enough to facilitate all trade between them (CNBC, 2017). Therefore both nations still use US dollars for bilateral trade (CNBC, 2017).

Going forward, based on the words and intentions expressed by both nations, it's evident they want to increase trade between each other without having to rely on US dollars.

In addition to rubles and yuan being increasingly traded between Russia and China, there are other ways in which both nations are economically integrating with each other that are negative for the US dollar (Prasad, 2016). In March 2017 a Chinese clearing bank opened in Moscow which is the first of its kind (Global Research, 2017). The clearing bank allows both nations to increase their financial bilateral interconnectedness (Global Research, 2017). Specifically, the clearing bank creates a pool of yuan liquidity in Russia that allows Russia and China to trade in yuan, which subsequently means circumnavigating bi-lateral trade in US dollars (Global Research, 2017). Additionally, in the same month, Russia announced that for the first time they will be issuing yuan denominated bonds worth the equivalent of approximately US\$1 billion (CNBC, 2017).

Without question, China is increasingly trading globally in yuan on a bilateral basis, something that is likely to continue. In saying this, there is no meaningful trade being conducted in yuan that does not involve China (Prasad, 2016); i.e. Australia is not trading with South Korea in yuan. Although this eventually will likely change in the future, particularly if China backs the yuan with gold, as will be discussed in the gold section of this chapter (Prasad, 2016). However, before that discussion, it is also important to consider the other structural elements and measures China has, and continues to take, with regard to competing with the US for global economic hegemony.

China's Growing Economic Hegemony

(In order, the following themes will be covered)

China's Growing Economic Hegemony
1) The Structural Opening of Their Economy and Financial Markets
2) One Belt One Road Project
3) Asian Infrastructure Investment Bank
4) BRICS New Development Bank
5) China International Payment System
6) Final Notable Points

1) The Structural Opening of Their Economy and Financial Markets

Historically, the Chinese financial market and investment market has been very restricted and closed off from the international community. If they ever want to have the yuan act as a true global reserve currency, they are going to have to have an open economy and financial system. In saying this, China, in recent years, has taken large and substantial steps to open up internationally in their ambition to become similar to the highly open and developed financial markets that are found in the US, United Kingdom, EU, Japan, etc.

Firstly, in November 2014, arguably long overdue, China finally allowed all and not just some foreign investors to purchase shares on their Shanghai Stock Exchange (Wang, et al., 2015). This is very important for China if they want to continue to develop world class companies like Alibaba, Huawei and Lenovo, who benefit greatly from going public (Kroeber, 2016). Also, if China wants the yuan to act as a reserve currency, it is important to allow foreigners to be able to hold their reserves in a liquid asset such as stocks (Prasad, 2016). Additionally, the inflow of foreign capital will long-term be of benefit to the Chinese economy if and when it freely floats the yuan (Blackwill, & Harris, 2016).

Secondly, in March 2017, regulators in Hong Kong and China agreed to allow Hong Kong traders to purchase Chinese debt (Bloomberg, 2017). However, it is only a one-way trade, meaning Chinese on the mainland cannot yet purchase Hong Kong debt (Bloomberg, 2017). Additionally, foreign countries cannot yet purchase Chinese debt. However, due to Hong Kong

being a key global financial hub, foreigners will be able to purchase Chinese debt indirectly through Hong Kong, albeit not as cheaply or efficiently as buying it directly. In the future, China has indicated that the long-term goal is eventual full liberalisation and opening of their debt market to the entire world once the Chinese economy is financially and economically capable (Prasad, 2016). Again, like the stocks, it is vital China has an open debt market as reserve currencies need to allow foreigners the ability to invest their foreign exchange receivers (Blackwill, & Harris, 2016).

Thirdly, while China has Free Trade Zones, it is challenging for multinationals to invest in China as they are required to make strategic investments by partnering with Chinese firms (Kroeber, 2016). This often leads to accusations from multinationals that the Chinese counterpart is stealing production and trade secrets (Wang, et al., 2015). Many global and US multinationals, such as Facebook, Google and Apple, complain vigorously about this restrictive investment climate in China (Kroeber, 2016). However, since 2008, China and the US have been negotiating on a possible bilateral investment treaty between both countries (Kroeber, 2016). While such an agreement was close to being agreed on under the Obama administration, it still has not been signed as of October 2017 (Kroeber, 2016). However, it does not mean it will not happen. Both sides continue to work towards finally reaching an investment agreement. Additionally, China is currently negotiating similar types of bilateral investment treaties with other key global economies such as the EU, who in July 2017 conducted their 14th round of talks (European Commission, 2017). Eventually, as China becomes richer, the need for investment treaties will increase. Therefore, in the coming years, China will finally reach agreements with investment treaties with key countries globally.

Fourthly, with regard to free trade agreements, the Chinese have, in recent years, actively engaged diplomatically to secure free trade agreements globally. The first developed country China signed a free trade agreement with was New Zealand in 2008 (China FTA Network, 2017). Since then, as of October 2017, in addition to a free trade agreement with ASEAN nations, China has 11 other free trade agreements with other countries (China FTA Network, 2017). Australia, South Korea, Singapore and Switzerland being the most important (China FTA Network, 2017). Additionally, along with four other countries, negotiations for free trade agreements with Japan, and the six nations that make up the Gulf Cooperation Council, are under negotiation (China FTA Network, 2017). Finally, although there is no guarantee it will come into existence, China is a part of the 16 Asian nations trying to sign the Regional Comprehensive Economic Partnership (RCEP); the trade deal that is arguably a direct rival to

the TPP (China FTA Network, 2017). Free trade deals are inherently open as by definition they mean the reduction of protectionist policies such as tariffs, quotas, etc. As a result, the fact that China, in the last 10 years, has been so active in pursuing free trade deals is a strong indication of them opening up their economy globally.

The final point that needs to be made is the strong words of intent China has used to show they are serious about continuing to open their economy and financial system. While there are many examples of this, two notable examples are as follows. In a parallel universe that would have been unimaginable by many in the West just five years ago, China has become the champion and main voice of globalisation. At the 2017 Davos World Economic Forum, President Xi Jinping in response to the rise in global nationalism said, “We must promote trade and investment, liberalization and facilitation through opening up – and say no to protectionism” (World Economic Forum, 2017, Para, 6). During October 2017 at the 19th National Congress of the Communist Party of China, President Xi Jinping told the world,

China’s open door will not be closed, it will only be opened wider. We will clean up rules and practices that hinder a unified market and fair competition, support development of private firms and stimulate vitality of all types of market entities (Reuters, 2017, Para. 7).

Both examples are clear that China plans to continue to open their economy and financial markets long-term.

While China clearly wants to open their economy and financial markets, there is still a long way to go for China to be considered an open financial market. The yuan is still pegged to the US dollar, capital flow restrictions are still in place for both Chinese and foreign investors and foreign ownership still make up a very small percentage of total financial assets owned. Additionally, China’s financial regulations need to be improved and clarified as there are many questions and concerns foreign investors still face with regard to taxes, ability to withdraw funds, legal aspects, etc. However, assuming China remains committed to opening up their economy and financial markets, it is likely, in the years ahead, they will be similarly open as key western economies and markets are today.

2) *One Belt One Road Project*

Regarded as the “Project of the Century” by Chinese president Xi, the One Belt One Road project, also known as the New Silk Road, is the key initiative in helping China achieve its

goal of achieving economic hegemony (Kroeber, 2016). Announced on October 2013, this multi decade-long project aims to connect up to 60 countries through land and sea routes through infrastructure investment in roads, rail links, sea ports, etc (Miller, 2017). Ultimately, the intention is to connect Europe and Africa to China to allow effective transportation of goods (Kroeber, 2016). Additionally, the development of other crucial infrastructure projects, such as dams and power stations, for poor developing nations are also a part of the One Belt One Road initiative (Miller, 2017). As it is an open-ended initiative, the final cost is unknown. However, estimates of the cost range from \$4–8 trillion dollars (Miller, 2017).

China benefits from this initiative in two key ways. Firstly, by providing subsidised loans, cheap Chinese labour, engineering know-how and, in some cases, free development, China is able to buy economic favours and influence in the nations they help (Miller, 2017); i.e. Pakistan in 2017 announced they will open up the mineral-rich Baluchistan region of the country exclusively to China's 'Silk Road' firms (Reuters, 2017). This long-term game of increasing their economic hegemony brings the countries China helps closer to them while simultaneously driving them away from the US economic influence (Blackwill & Harris, 2016). Secondly, by improving the infrastructure route between nations, it is cheaper for China to export their manufactured goods while simultaneously reducing the cost of importing key goods such as oil and natural gas. Both factors are economically beneficial to the Chinese economy by reducing transportation costs.

As a historical reference, the One Belt One Road project is similar to the US Marshall plan in which the US was able to buy influence in Europe by partially paying for the cost of rebuilding Europe in the aftermath of WWII (Haass, 2017). This policy is generally regarded as being successful in advancing the US interests well into the second half of the 20th century (Haass, 2017). Crucially, with the US America First stance under President Trump, it is not helping the US maintain their global economic position (Haass, 2017). Trump's threat to terminate free trade agreements and the cuts in foreign aid are evidence of this (Haas, 2017). As a result, China could close the economic hegemony gap that America enjoys far faster than what would have been previously thought possible during the Obama administration, simply as China is doing everything to foster economic hegemony whereas the US is not (Haass, 2017).

3) *Asian Infrastructure Investment Bank*

In 2014 China announced that they will be creating the Asian Infrastructure Investment Bank (AIIB) (The Guardian, 2015). The AIIB was established to provide international loans for

development projects for poorer nations, effectively doing the same job the US controlled World Bank once did (Financial Times, 2015). The US was originally vocal in urging many of its key allies to think carefully about joining the AIIB (The Guardian, 2015), as the US sees China trying to increase their global economic hegemony at their expense (Financial Times, 2015). While not a direct threat, the US was making it clear to countries such as the United Kingdom, Germany, Australia, South Korea etc., that the US did not want them to join (The Guardian, 2015).

However, with virtually all major US allies joining, the US had to grudgingly change its stance (Financial Times, 2015). President Obama would go as far as saying the AIIB “could be positive for Asia” (Financial Times, 2015). These words are by no means a ringing endorsement but they are also not explicitly antagonistic towards China (Financial Times, 2015). In saying this, the US continues to express concerns saying that they hope the AIIB meets “high standards, particularly related to governance, and environmental and social safeguards” (The Guardian, 2015). China has expressed interest in the US joining, saying it would be a “good thing” (The Economic Times, 2016). As of October 2017, the US is yet to have joined.

4) BRICS New Development Bank

Another very important multilateral institution China has helped create is the BRICS New Development Bank (NDB). With the treaty signed in July 2014, the NDB is an attempt of the BRICS nations of Brazil, Russia, India, China and South Africa to compete with the role the US-led World Bank facilitates (Kroeber, 2016). Additionally, if one of these five countries was to run into financial trouble, this institution can replace the role the IMF traditionally does by bailing out one of these nations with cheap loans (Kroeber, 2016). As evidence of its importance, Nobel Prize winning economist Joseph Stiglitz said the NDB is a “fundamental change in global economic and political power” (RT, 2014). While China has only one-fifth control of this organisation, it is still a valuable institution, along with the AIIB, to challenge the American-led World Bank (NDB, 2017).

5) China International Payment System

Known as the Society for Worldwide Interbank Financial Telecommunication (SWIFT), the US has effectively had a monopoly on the global payment system (Armstrong Economics, 2016). As has been demonstrated with Iran in response to their nuclear programme, China and Russia, who to a degree are at the mercy of the US in this regard, have created their own

international payment systems in recent years (Prasad, 2016). Focusing on China's payment system, their system was founded in 2015 and is known as the China International Payment System, or the CIPS network (Financial Times, 2015). As of time of writing, 47 nations have established financial institutions that can carry out financial transactions with the CIPS network (Armstrong Economics, 2016). Compared to the SWIFT system, the CIPS has far less financial institutions signed up (Armstrong Economics, 2016). In saying this, the network is established and could rapidly and easily be expanded in the future if more financial institutions choose to sign up (Financial Times, 2015).

6) Final Notable Points

An important point to mention briefly is that President Trump's decision for the US to withdraw from the Trans-Pacific Partnership Agreement (TPPA) was a self-inflicted wound to the US economic hegemony and benefited China (Haass, 2017). Just a week prior to the US withdrawal from the TPPA, the Chinese government news agency wrote the TPPA was "the economic arm of the Obama administration's geopolitical strategy to make sure that Washington rules supreme in the region" (BBC, 2017, Para 4) Although China has been quiet on the matter, they will have been very happy with this outcome as crucially China was not a potential member and would have missed out on the economic benefits the TPPA promised to provide (Haass, 2017).

Finally, the Chinese yuan becoming the fifth currency to be incorporated as part of the IMF's SDR was an important event. As evidence of China's growing role and position in the IMF, Christine Lagarde in July 2017 said, "If we have this conversation in 10 years' time...we might not be sitting in Washington, D.C. We'll do it in our Beijing head office" (The New York Times, 2017, Para. 2). Her comments implied that the head office of the IMF could be relocated from Washington D.C. to Beijing, which as can be imagined, drew criticism from American officials and politicians (The New York Times, 2017). More on China's growing role in the IMF will be discussed in the next section.

In conclusion, it is clear that China, with the help of Russia to a degree, have long-term strategic objectives of making the Chinese yuan an economic rival to the US dollar. While arguably not there yet, the Chinese yuan has the propensity to rival the US dollar as a key global reserve currency. More on this will be discussed in the gold section of this chapter.

Special Drawing Rights (SDR)

As mentioned in Chapter 1, SDRs are a world currency that was created by the IMF in 1969 during the backdrop of great uncertainty in the US dollar's global role (IMF, 2017). With the IMF acting as the bank, governments internationally can trade SDRs among each other to settle balance of payments (IMF, 2017). With regard to its value, a SDRs value originally was valued in gold at 0.888671 grams of fine gold to one SDR (IMF, 2017). After the collapse of the Bretton Woods agreement, the five key currencies of the time comprised of the US dollar, British pound, French franc, German mark and Japanese yen (IMF, 2017). Each were allocated on a weighted basis by the currency's global influence (IMF, 2017). Today, with the Chinese yuan inclusion in October 2016, the five currencies include the US dollar, the euro, yuan, yen and pound, making up respectively 41.73%, 30.93%, 10.92%, 8.33%, and 8.09% of a SDRs composition (IMF, 2017). This means that as of October 2016, the true value of a SDR is the collective value of US\$0.58252, €0.38671, 1.0174 Yuan, ¥11.9 and £0.085947 (IMF, 2016).

The inclusion of the Chinese yuan was a very important development, as it gives the yuan legitimacy as an integral global currency. The point of view of the Chinese, in a statement made by the People's Bank of China, they said, "The inclusion into the SDR is a milestone in the internationalization of the renminbi, and is an affirmation of the success of China's economic development and results of the reform and opening up of the financial sector" (Business Insider, 2016, Para. 4). The director of the IMF, Christine Lagarde, highlights and articulately explains the significance of this event by saying,

The Renminbi's inclusion reflects the progress made in reforming China's monetary, foreign exchange, and financial systems, and acknowledges the advances made in liberalizing and improving the infrastructure of its financial markets. The continuation and deepening of these efforts, with appropriate safeguards, will bring about a more robust international monetary and financial system, which in turn will support the growth and stability of China and the global economy (IMF, 2016, Para. 15).

Christine Lagarde's comments are very important as it shows the growing reality that China is likely going to continue to gain global financial influence.

Looking at the amount of SDRs in circulation, the first allocation was a total of 9.3 billion SDRs which were distributed between 1970 and 1972 (IMF, 2017). The second allocation was

an additional 12.1 billion distributed between 1979 and 1981 (IMF, 2017). Finally, the latest, and by far the largest, allocation was 161.2 billion additional SDRs which was conducted on August 28, 2009 (IMF, 2009). This allocation was in the immediate aftermath of the GFC and was conducted to ensure there was enough liquidity globally to facilitate world trade if there was a global credit crunch or a run on the US dollar (IMF, 2009). If there is a complete run on the US dollar, it would not be surprising to see another large allocation of new SDRs, like what transpired in 2009 in order to ensure there is ample global liquidity.

One key difference between SDRs and normal conventional currencies is that only governments can own, buy or sell SDRs (Dailami et al., 2014). Therefore, in its current form, SDRs would not be a suitable replacement as a global currency in its present form, at least not for businesses and households that purchase goods globally (Dailami et al., 2014). In saying this, there is nothing preventing SDRs from being used as the main reserve currency to balance trade payments between governments (Chey, 2012). This would likely happen in the event of a run on the US dollar (Chey, 2012). Whether the SDR would permanently replace the US dollar only temporarily fill the void, or whether the SDR would be used as a transition currency to allow the rise of another reserve currency, such as a gold backed yuan or the rise of a cyber currency, remains to be seen (Costiganm et al., 2017). In short, the SDR can be considered an insurance currency ready to facilitate the role of reserve currency of last resort in times of great economic uncertainty (Costiganm et al., 2017).

Gold

In the wake of the GFC, some world leaders have called for the reestablishment of currencies backed by gold instead of the fiat currencies we have today. As was briefly discussed in Chapter 1, there were many benefits for the US when the US dollar was backed by gold. These included stable prices, exchange rate predictability and general level of confidence. As was studied in Chapter 5, the debt position and the unorthodox monetary policies that have been implemented in the post GFC era have reduced confidence in the value of these fiat currencies value due to the risk of the Bond Vigilantes concept.

This problem could be solved by tying these fiat currencies back to a gold standard as owners of these currencies will have assurance their physical currency could be converted to the intrinsically valued gold on request (Rickards, 2016). Additionally, a gold standard keeps governments spending, and hence debt issuing, in check as excessive government expenditure is inflationary (Rickards, 2016). With moderate to high levels of inflation, holders of currency

are incentivised to convert their paper dollars to the comparatively nominally cheaper fixed gold price (Rickards, 2016). These market forces are what keeps government expenditure in check (Rickards, 2016). As a result, there is definitely the possibility of today's key fiat currencies, including the US dollar, being converted back to a gold standard, particularly if there is a crisis of confidence and a run on these fiat currencies (Rickards, 2016).

At the 2009 Arab League Summit in Doha, the Libyan leader Muammar Gaddafi proposed that African and Muslim nations create an international gold-based currency for the purpose of trading oil (Forbes, 2016). This obviously would be negative for the US petrodollar system and therefore the US dollar as a global reserve currency (Foreign Policy Journal, 2016). Evidence from leaked emails from Hillary Clinton, when she was Secretary of State, show that stopping Gaddafi's gold backed currency plans played a part in the decision to overthrow Gaddafi in 2011, instead of just on humanitarian grounds as was the official justification (Foreign Policy Journal, 2016). Similar parallels have been drawn to the former Iraqi leader, Saddam Hussein, who was toppled by the US in 2003 (Foreign Policy Journal, 2016). Before he was overthrown, the Iraqi leader refused to trade Iraqi oil for US dollars due to, in his words, "not wanting to deal in the currency of the enemy" (Time, 2000).

In 2010 the president of the World Bank grabbed a considerable amount of attention from global leaders when he called on G20 nations to consider the idea of implementing a Bretton Woods 2.0 system (Financial Times, 2010). In his address Robert Zoellick said,

The system should also consider employing gold as an international reference point of market expectations about inflation, deflation and future currency values. Although textbooks may view gold as the old money, markets are using gold as an alternative monetary asset today (Financial Times, 2010, Para. 6).

Robert Zoellick's words are particularly notable coming from an institution that is heavily influenced by the US.

Some countries have even gone as far as already implementing a gold standard. In a world first in the fiat currency age, in 2016, the Accounting and Auditing Organisation for Islamic Financial Institutions (AAOIFI) have created a Shari'ah gold standard (Bloomberg, 2016). This new currency can be used for up to \$1.88 trillion in Islamic financial transactions that are lawful with the Islamic religion (Bloomberg, 2016). While it is not a currency denominated to one specific country, as countries such as Bahrain, Qatar, United Arab Emirates, etc. can use it, it

is still an important development that could pave the way for more established currencies converting to a gold standard (Bloomberg, 2016).

Although the Shari'ah gold standard is a significant first step in a potential transition to gold backed currencies, the most influential movement towards this initiative have been those carried out by Russia and China and, to a smaller degree, Iran and the other BRICS nations. The rest of this section will focus on the actual gold owned by the seven countries studied in this thesis along with Russia and China. Following this, words and actions of Russia, China and the US with regards to potentially implementing a gold standard will be discussed. Finally, a brief point with regard to multiple gold backed currencies will be discussed to conclude this section of the chapter.

Total Governmental Ownership of Gold

Looking at Figure 46, all seven key countries studied in this thesis show that their gold holdings have not changed in the last 17 years, with the exception of France and Spain who have modestly decreased their holdings (World Gold Council, 2017). At 8,133.5 tonnes of gold, the US is by far the biggest owner of gold globally. Studying Figure 47, it is very clear that unlike western nations, Russia and China are increasing their ownership of gold. Russia's increase in holdings of gold started around the GFC (World Gold Council, 2017). In the last 10 years, Russia's gold holdings have increased steadily from approximately 400 tonnes to the current 1,680 tonnes (World Gold Council, 2017). This is particularly noticeable as Russia has prioritised building up their gold reserves in recent years despite the collapse in oil price and the implementation of western sanctions that have noticeably hit the Russian economy hard (Rickards, 2016).

China, which does not publish their gold holdings regularly, has over the last 17 years seen its holdings increase from approximately 400 tonnes to over 1,842 tonnes as of October 2017 (World Gold Council, 2017). While both Russia's and China's gold holdings are far smaller than the US's 8,133 tonnes or Germany's 3,377 tonnes, they have made remarkable progress in closing the gap since the GFC (World Gold Council, 2017). It's also important to note that China and Russia are the first and third biggest miners of gold respectively and continue to increase their gold mining capacity (World Gold Council, 2017). While these efforts to increase gold holdings are important, it's the words from Russian and Chinese governmental officials that are most telling of both countries' intentions.

Russia

Starting with Russia, at a G8 currency meeting in 2009, the Russian president Dmitry Medvedev held up a gold coin where he was quoted as saying this “is an example of a future world currency” (Forbes, 2016). These comments were framed in the context of Russian dissatisfaction with the US dollar, particularly as the Russians viewed the US largely responsible for the GFC. Additionally, at this meeting, the Russian delegation voiced their support for a gold backed SDR that would also “logically” include rubles and yuans (Forbes, 2016). The strongest words of Russia’s disapproval of the US dollar came from Vladimir Putin on numerous occasions. In one instance, in 2011, he was quoted as saying,

They (the US) are living beyond their means and shifting a part of the weight of their problems to the world economy. They are living like parasites off the global economy and their monopoly of the dollar. Countries like Russia and China hold a significant part of their reserves in American securities. There should be other reserve currencies (Reuters, 2011, Para. 7).

While words matter, Russia has to be pragmatic. As at time of writing, the Russian economy is only the twelfth biggest in the world, they are heavily economically sanctioned by the West, their economy is far too dependent on natural resources such as oil and they have very unfavourable long-term demographic trends (Haass, 2017). As a result, it is very unlikely a gold backed ruble by itself could dethrone the US dollar as the key global reserve currency. Expressed differently, in the future, it’s very unlikely Europeans will demand Russian rubles when trading with Japan, Australia, US, etc. In saying this, as Europe realises, on Russian oil, this economic weapon, which has been applied twice in the winter months of 2006 and 2009, could effectively force European nations to trade with Russia in rubles in the future. Therefore, at best the Russians could only demand all trade with them be done in gold backed rubles. With the above points in mind, the best way Russia can undermine the US dollar as the key global reserve currency is to form a closer economic alliance with China, which they are doing.

As was mentioned in the Chinese yuan section, Russia is opening up clearing banks in Beijing and is now issuing yuan denominated bonds. In addition to these moves, both Russian and Chinese economic and financial officials are increasingly working closer together on the currency front. In 2015 the Russian Central Bank chief, after meeting his Chinese counterpart, said,

We discussed the question of trade in gold. The BRICS countries are large economies with large gold reserves and impressive volumes of production and purchase of this precious metal. In China, gold is traded in Shanghai, in Russia, Moscow. Our idea is to create a link between these sites in order to intensify trade between our marketplaces (Sputnik, 2016, Para. 8).

A year later, when the Russian and Chinese Bank officials met again, the Russian Bank stated, “The Russia and the People’s Bank of China are working on a memorandum of understanding (MOU) on gold trading, in order to solve technical problems for China to import Russian gold” (Reuters, 2017, Para. 3). Therefore, looking forward, it is going to be very important to closely watch the increasing integration and cooperation of Russia and China on the currency front.

China

Focusing on China, in May 2015, the Chinese government announced they had established a state-owned Gold Investment Fund (Reuters, 2015). The aim of this fund is to invest in gold mining projects as part of the One Belt One Road project (Reuters, 2015). With initial funds of \$16 billion, it is the largest gold investment fund in the world (Reuters, 2015). Additionally, this fund complemented China’s Shanghai Gold Exchange (SGE) by increasing its trade in gold. The long-term goal for the SGE is to make the SGE available to foreign financial institutions and governments.

In September 2016 Sberbank, Russia’s largest bank, was granted membership to trade gold on the SGE (Reuters, 2017). Shortly after, VTB, another large Russian bank also gained access to the SGE to trade physical gold (Reuters, 2017). In June 2017, it was announced that the SGE would be opening a Budapest branch; the first overseas branch (South China Morning Post, 2017). Over time, there will likely be more financial institutions and countries that sign up with the SGE to physically trade gold (CNBC, 2016). As of late 2017, the SGE is now the world’s largest physical bullion exchange ahead of the London Gold Exchange (Reuters, 2017). While the trading of physical gold internationally is an important milestone, there is a more efficient way to do so without having to actually physically move the gold. This can be done by trading gold backed yuan-futures.

A financial future is a contract that obligates the seller to sell an asset or the buyer to purchase an asset, such as commodities or other financial instrument, at a prearranged price and future date (Investopedia, 2017). So a gold backed yuan future allows a buyer to purchase an X

amount of goods and pay for the goods as a predetermined price denominated in yuan at a predetermined future to the seller (Investopedia, 2017). Being backed by gold, if a holder of these yuan futures wants to convert it to physical gold they can do so through the SGE. Otherwise, as most investors will likely choose, they will be content holding yuan with the insurance and knowledge that they can convert it to gold at any time if they choose to.

In April 2016 the Chinese government announced the SGE would offer such gold back yuan futures (CNBC, 2016). This is a major development that and is the strongest indication that China is planning on one day fully backing the yuan to gold. A year later, in July 2017, the Chinese government announced that they were going to implement a gold backed yuan future specifically for oil (South China Morning Post, 2017). As China is the world's biggest oil importer, this will be very beneficial to them not having to use the US dollar to purchase a vital commodity (South China Morning Post, 2017). Going forward, assuming this gold back yuan future and its oil variant are successful it would not be unreasonable to expect the yuan itself to be backed by gold. Time will tell but without question gold backed yuan futures are a very important step.

United States

Looking at the US, influential individuals appear to be opening up to the idea of reinstating the US dollar on a gold standard. However, as Starting with President Trump, in a November 2016 interview he said, "Bringing back the gold standard would be very hard to do, but boy, would it be wonderful. We'd have a standard on which to base our money" (The New York Times, 2016, Para. 3). It's important to note that it is unclear to the degree of President Trump's understanding on the matter as he said in the same interview, "We don't have the gold. Other places have the gold" (The New York Times, 2016, Para. 3). When in reality, the US has more gold than the next three governments combined (World Gold Council, 2017). Nonetheless, it is still very notable that President Trump suggested this, as his 'shoot from the hip' unorthodox approach to politics suggests he is more likely than prior presidents to implement such a consequential decision.

On the 2016 campaign trail, both republican candidates, Ted Cruz and Rand Paul, made campaign promises to place the US dollar on a gold standard if they were elected (The Atlantic, 2015). On the campaign trail Ted Cruz said on the matter, "Instead of adjusting monetary policy according to whims and getting it wrong over and over again and causing booms and busts, what the Fed should be doing is ... keeping our money tied to a stable level of gold" (The

Atlantic, 2015, Para 2). In addition to politicians, there have been dozens of influential economists and financial titans who have also called for a gold standard. Some of which include Jim Rickards, George Soros, Marc Faber and Kenneth Rogoff who think all emerging markets should adopt a gold standard. However, arguably one of the most important supporters for the gold standard is the ex-head of the Fed, Alan Greenspan.

In Greenspan's view, if the US was still on a gold standard it would not be in the debt situation it finds itself in today. He specifically said,

Today, going back on to the gold standard would be perceived as an act of desperation. But if the gold standard were in place today we would not have reached the situation in which we now find ourselves. We cannot afford to spend on infrastructure in the way that we should. Much such infrastructure would have to be funded with government debt. We are already in danger of seeing the ratio of federal debt to GDP edging toward triple digits. We would never have reached this position of extreme indebtedness were we on the gold standard, because the gold standard is a way of ensuring that fiscal policy never gets out of line (Business Insider, 2017, Para. 5).

Although he is a retired central banker, it is still noteworthy, as he still is a highly respected individual whose opinion carries weight to this day with key Fed decision makers.

However, it's also important to note that more critics and individuals of influence are against the US adopting a gold standard than are for it. Some include Nobel prize-winning economists Paul Krugman and Joseph Stiglitz, as well as other prominent individuals, such as Nouriel Roubini and Warren Buffett. Most influentially, current Fed Chairlady Janet Yellen and former Fed Chairman Ben Bernanke are against the idea. Ben Bernanke has been quoted as saying,

Since the gold standard determines the money supply, there is not much scope for the Central Bank to use monetary policy to stabilize the economy. Under a gold standard, typically the money supply goes up and interest rates go down in a period of strong economic activity — so that's the reverse of what a Central Bank would normally do today (Reuters, 2012, Para. 6).

While there are more influential individuals who are against adopting a gold standard than those for adopting a gold standard, the fact that it has become a discussion in the political and academic communities is notable. Prior to the GFC, only fringe economists discussed the

merits of adopting a gold standard (Eichengreen, 2012). However, as was discussed, in the event of a run of fiat currencies, converting back to a gold standard could be the answer to generate confidence. When faced with such a scenario, critics will still have legitimate concerns about adopting a gold standard. It's likely they will want a lesser of two evils compared to completely letting the fiat currencies crash. Many of the vocal critics today may change their opinions on the subject when faced with a crisis of confidence.

With regard to the feasibility of converting the US dollar back to a gold standard, some individuals claim there is not enough gold to back a currency. But with 8,133.5 tonnes of gold, the US owns more than enough to do so (Rickards, 2016). This is because a gold standard does not require a 100% gold to dollar ratio (Rickards, 2016); i.e. if gold was back at 40%, as it was mandated by the Federal Reserve Act of 1913, there can be \$2.50 of paper currency in circulation for every \$1 in gold (Rickards, 2016). Additionally, if the US was to go back to a gold standard, the nominal price of gold would have to nominally be valued far higher than its current price of roughly \$1,300 an ounce (Gold Price, 2017).

As a back of an envelope calculation, assuming a 40% backing ratio, the price of gold would be valued in nominal terms at \$6,070 an ounce today. This value is derived by dividing the current monetary base of \$3.95 trillion by the 260.3 million ounces owned by the US government multiplied by 0.40 (FRED, 2017). Therefore the issue is not whether there is enough gold supply for a gold standard, there is. The question is what the backing would have to be to instil enough public confidence in the system and what the convertible nominal price of gold should be (Rickards, 2016).

Multiple Gold Backed Currencies

The last important point to discuss is that there is nothing preventing multiple nations implementing their own gold backed currency. At US\$1,300 an ounce, the US gold holdings value as a percentage of GDP is 1.82% (Ottawa Bullion, 2017). Compared to Russia, China, the eurozone, Japan and the United Kingdom, their gold holding values as a percentage of GDP are 5.6%, 1.5%, 3.6%, 0.65% and 0.50%, respectively (Ottawa Bullion, 2017). The most glaring number is Russia's 5.6% which is three times larger than the US (Ottawa Bullion, 2017). Russia, by having this much gold, gives them more legitimacy and would provide more confidence in holders of rubles as they could have a higher gold backed ratio. This is important for Russia as the ruble is relatively more of a fringe currency than the other key global currencies.

Additionally, if China keeps acquiring gold at the rate that they have been they will, in the coming years, reach parity with the US, which will be symbolically important if there is a global rush to back currencies with gold. As a result, even if the US dollar one day is backed by gold, there could also be a gold back yuan and a gold backed ruble for the US dollar to compete with. As gold is gold, in this potential future scenario, the US dollar may have to compete with other nations for the title of having their currency act as the sole key reserve currency. Alternatively, in the future there may be a world in where there is no sole key reserve currency and instead there is a world in which two, three, four, etc. currencies are used for the vast majority of all global financial transactions.

Cyber Currencies

The most popular cyber currency, Bitcoin, was created in 2009 by a mysterious programme/group of programmes under the name of Satoshi Nakamoto (Narayanan, Bonneau, Felten, Miller, & Goldfeder, 2016). At the time, it was hard to consider bitcoin as a currency as it did not meet the characterisation of a medium of exchange as no merchant accepted it as a form of payment (Narayanan et al., 2016). However, bitcoin first found a niche market with drug dealers and other illegal activities due to its untraceable nature (Narayanan et al., 2016). Over time, more and more merchants have started to accept bitcoin, with estimates of over 100-150k merchants globally accepting bitcoin as payment in 2017 (Narayanan et al., 2016). Additionally, with the success of bitcoin, other cyber currencies have been created. As of 2017, there are dozens of other cyber currencies that have unique characteristics including ethereum, ripple and litecoin (Coinmarketcap, 2017).

Since the start of 2017, bitcoin has risen in value by over 500% in value while ethereum is up over 4,000% (Charts, 2017). These remarkable growth rates have subsequently attracted a considerable amount of attention by the financial media and market commentators who are not shy about predicting the future value of bitcoin and cyber currencies in general. Saxo Bank analysis Kay Van-Petersen, who correctly predicted that bitcoin would hit \$2,000 when it was trading at \$700, now predicts it will be worth \$100,000 in 10 years (CNBC, 2017). Jeremy Liew, the first investor in Snapchat, and Peter Smith, the Blockchain CEO and cofounder, both believe bitcoin could be worth \$500,000 by 2030 (Business Insider, 2017).

These predictions are on the high end and do not reflect the majority position. Additionally, there are plenty of bears on cyber currencies, such as billionaire Howard Marks who calls

bitcoin a “pyramid scheme”, billionaire Mark Cuban who calls bitcoin a “bubble” and JP Morgan CEO Jamie Dimon who thinks anyone buying bitcoin is an “idiot” (CNBC, 2017; CNBC, 2017). What cannot be denied is that bitcoin, and cyber currencies in general, are not a fad and nor are they likely to go away in importance. The big unknown going forward is whether cyber currencies could be the key global reserve currency, an important minority reserve currency or just a fringe currency in the future.

Cyber Currency Benefits

There are two key innovative technological breakthroughs that cyber currencies have brought forth that will ensure cyber currencies remain relevant with regard to future currencies. The first technological breakthrough is the blockchain technology which is the vital feature that makes cyber currencies safe from manipulation (Narayanan et al., 2016). Looking at bitcoin, a bitcoin is a continuously growing list of records of every single transaction ever conducted in the past (Narayanan et al., 2016). Every 10 minutes, all transactions are updated across the entire network of bitcoins (Narayanan et al., 2016). This means that when a bitcoin transaction is conducted, in order for it to be approved, the bitcoin being traded has to match every other bitcoin globally (Narayanan et al., 2016). This peer to peer verification ensures that bitcoins cannot be hacked, stolen or manipulated as any tampering of a bitcoin would make it different from the entire network of bitcoins; hence making them useless (Narayanan et al., 2016).

This ingenious system is what provides trust and faith in the system (Ross, 2016). It’s important to note that bitcoins can be stolen if passwords to one’s bitcoin account (bitcoin wallet) are not secure (Ross, 2016). In effect, it is possible to be robbed outside the bank but it’s impossible to rob the bank itself. This means, in theory, it’s impossible for a hacker to conduct a system wide hack of the bitcoin network or for any individual for that matter, assuming they do not have the individual’s password (Narayanan et al., 2016). This blockchain innovation system is revolutionary and is already finding other uses in other fields such as artificial intelligence, the recording of medical records, electricity market, property markets etc (Ross, 2016). As a result, blockchain technology and its inherent security aspect make cyber currencies a legitimate potential global reserve currency.

The second very important technological breakthrough cyber currencies bring is that they mimic a gold standard due to their finite supply. Looking at bitcoin, in total there will one day be a maximum of 21 million bitcoins in circulation (Narayanan et al., 2016). Currently, 14 million have been ‘mined’ with the last one to be mined set to occur in 2140 (Narayanan et al.,

2016). To mine a bitcoin, a computer is required to solve complex mathematical problems with its processing power (Narayanan et al., 2016). The more computer processing power, the more bitcoins that can be mined (Narayanan et al., 2016). Professional bitcoin miners used tens of thousands of computers to do just this (Narayanan et al., 2016). The genius of the system is that the more bitcoins that are mined, the more processing power is required to mine the next coin (Narayanan et al., 2016). This mimics gold.

Originally, gold was easy to find as it was on the earth's surface located in river beds (Narayanan et al., 2016). Once more miners (computers) started to mine for gold (bitcoins), the low-lying fruit disappeared. To continue to get gold (bitcoins), miners had to start digging deeper (needed more computer power) which costs more (Narayanan et al., 2016). This, in turn, leads to higher prices for gold (bitcoins) (Narayanan et al., 2016). Under a gold standard, if the world economy is booming, the price of gold increases, causing more miners to mine for gold (Rickards, 2011). If the world economy is contracting, the price of gold decreases making gold unprofitable to mine (Rickards, 2011). This self-stabilising dynamic is what makes a gold standard attractive as it leads to stable prices as long as the dollar to gold ratio is set appropriately (Rickards, 2011). As cyber currencies possess the same dynamics as gold, in theory there is nothing preventing cyber currencies providing the same benefit that a gold standard would (Rickards, 2016).

Governments' Response to Cyber Currencies

There is the potential for governments globally to crackdown and prevent the use of bitcoin as a legitimate form of payment (Ross, 2016). This is because it is very hard/near impossible for central banks to control cyber currencies as they are a peer to peer network that does not require a central bank to issue the currency (Ross, 2016). Additionally, concerns about money laundering and the ability to collect tax on cyber currency transactions remain (Ross, 2016). However, there is a growing trend of nations globally officially accepting the use of cyber currencies as legitimate currencies (Ross, 2016). With this being said, while cyber currencies are being recognised as legitimate, there is a rising trend of nations implementing regulations on the use of cyber currencies (CNBC, 2017). China, Japan, United Kingdom and Australia are all globally significant nations that have recently taken such measures (CNBC, 2017). Venezuela, with its economic and political struggles, has gone as far as making it illegal to trade in bitcoins (CNBC, 2017). However, a lot of market participants feel growing global

regulatory pressure is a good thing as it shows governments are recognising cyber currencies as legitimate currencies (CNBC, 2017).

A final important aspect to consider with cyber currencies is that there is a growing trend of nations striving to create a cashless society (Rickards, 2016). Scandinavian countries and the Netherlands are leading the way with Sweden, Denmark and Netherlands aiming to be completely cashless by 2020 (Rickards, 2016). Another example is India who, in one day in 2016, took 86% of the money base out of circulation (Bloomberg, 2016). There are clear benefits for governments transitioning towards a cashless society, such as cracking down on black markets and tax evasion (Merki, 2015). It may only be a matter of time before it happens globally (Merki, 2015). While these are digital currencies, they are not the same as cyber currencies as they do not incorporate blockchain technology (Ross, 2016). Additionally, they do not possess characteristics of a gold standard, as there is nothing stopping these nations printing digital money (QE) as the money base is not finite like bitcoins' 21 million coins (Rickards, 2016).

Going forward, as governments continue to transition towards a cashless society, there is nothing stopping them from incorporating both blockchain technology and the gold standard aspect of scarcity that cyber currencies have (Rickards, 2016). Indeed, China and Russia have only just recently announced that this is their intention. In February 2017, after three years of research, China's Central Bank announced that they have test run the use of a Chinese cyber currency that "one day soon" will be implemented (Bloomberg, 2017). The deputy chief of the Russian Central Bank, Olga Skorobogatova, at the June 2017 St Petersburg Economic Forum said, "It's time to develop national crypto currencies, this is the future" (BRICS Business Council, 2017). As part of this speech she announced that the Russian Central Bank is working on creating their own national cyber currency (BRICS Business Council, 2017). Other prominent countries that are researching the use of cyber currencies include Germany, Canada and Singapore (Bloomberg, 2017).

As of October 2017, the US government has been quiet on the matter. However, if there is a future run on the US dollar, or any other currency for that matter, implementing a government controlled cyber currency arguably would be a viable way to restore confidence (Ross, 2016). There are many questions that would have to be addressed for this to happen, such as how to deal with sovereign debt, what the conversion rate would be between the fiat and new cyber currency, whether both currencies would trade in tandem, etc. (Costiganm et al., 2017).

Nevertheless, assuming these issues can be addressed and overcome, a US or Chinese backed cyber currency could very well act as a future global reserve currency.

Conclusion

It is clear that there are many developments that will have an influence on what future global currencies will look like. Considering the debt and monetary policies that have been implemented globally, it is improbable the current fiat currencies globally will continue to be the status quo over the long-term. To recap, the other minor reserve currencies of today are unlikely to become the key reserve currency as the home nations of these currencies have similar levels of debt and have implemented extraordinary levels of unorthodox monetary policy like the US. The SDR should be considered as an insurance currency to ensure that there will always be a reserve currency of some form. While it could be widely used in the aftermath of a future global crisis, it would likely only be used to buy time until the global economic superpowers can work out a perinate solution to the crisis.

As was discussed, China is increasingly conducting world trade in yuan which inherently weakens the US dollar's role in being the key global reserve currency. Additionally, it is very apparent that China's global economic hegemony is increasing and likely to continue to do so. However, a fiat yuan by itself is unlikely going to be able to function as a sole key global currency. The last two potential future reserve currencies are a gold backed currency and cyber currencies. In addition to acquiring large amounts of gold over the last 15 years, both Russia and China are telegraphing through words and actions that they may back their currency by gold in the future. If this was to happen, these new currencies would gain a considerable amount of legitimacy globally due to their intrinsic value. Importantly, there is nothing stopping the US from also pegging the US dollar to gold. Therefore it is very possible there could be multiple gold backed currencies in the future. In this scenario, the US dollar and Chinese yuan would likely share the role of being the key reserve currency globally.

Finally, 2017 has been a year where cyber currencies have gained a considerable amount of legitimacy globally. Or at the very least, are now widely talked about in financial and economic circles. There is the real possibility that bitcoin could be the key future global reserve currency. However, as mentioned, governments have started cracking down on cyber currencies for a variety of reasons. More likely, governments may issue their own cyber-backed currency, as China and Russia are experimenting with, to take advantage of the innovative block chain

technology. Again, like a gold standard, the US could also back the US currency to a cyber currency to counteract China and Russia if they do so in the future.

Going forward, the transition to a new global reserve currency will likely happen in one of two ways. Firstly, likely in the event of a global crisis of financial confidence, it would not be surprising to see a Bretton Wood 2.0 conference taking place to determine what the future global monetary system will look like. In this environment the US would have to make consensus demands from China, and to a lesser extent the Russians, in having their currencies play a greater role globally than they do today. However, the US would likely still be able to maintain the US dollar's role as a key reserve currency albeit in a diminished role than what it experiences today.

The second potential path towards transitioning to a new global reserve currency could come from China and Russia proactively undermining the US dollar. As mentioned, this could be done by these countries backing their currencies by either gold or a cyber currency. In this environment the US will have to be reactive to these developments by also backing their currency to gold or to a cyber currency. While the US dollar likely would be able to maintain its reserve currency status, it would be less influential than it is today.

Between these two options, it would be in the US interest to be proactive by initiating a Bretton Wood 2.0 conference as the US would be able to have a considerable amount of influence in dictating the future of the global monetary order. Put differently, there will be a considerable first mover advantage. As a result, the US has tough dissections to make in the future if they are serious about maintaining the US dollar's role as a key global reserve currency.

Conclusion

With all the above chapters explored, it's important to address the thesis research question: **Will the US dollar remain the sole key global reserve currency in the future?** The short answer is that it is in jeopardy and it is likely that, in the long term, the US dollar will be the first or second most important key reserve currency in a duplicity/multiplicity key reserve currency world. As was covered in Chapter 1, history shows the US government cannot be complacent in thinking that the US dollar role as the key reserve currency will always remain so. In saying this, the US dollar's complete demise is by far from being inevitable. However, the two key risks to the US dollar which have been covered in this thesis have to be addressed and properly managed by the US if they want the US dollar to remain as a key reserve currency globally.

This leads to the US government having to make two difficult decisions. The first decision is how they are going to deal with their growing level of debt. As was discussed in Chapter 5, the way the US chooses to address their sovereign indebtedness will have a significant impact on the US dollar's ability to function as the key global reserve currency in the future. The second decision that needs to be made is whether the US dollar will remain as a fiat currency, as it is today, or whether they will re-estate the US dollar to a gold standard or experiment with the implementation of a US dollar cyber currency. As was covered in Chapter 6, while the US government will not be able to fully control a bellicose Russia and an economically rising China, it could take steps to improve and ensure confidence that the US dollar's value remains which in doing so will weaken Russia's and Chinese actions in attempting to undermine the US dollar as the sole key reserve currency globally. If implemented correctly, both decisions together can ensure the US dollar, at the minimum, remains a key reserve currency or, at best, ensures it still remains the sole key reserve currency that it enjoys today.

With regard to the first decision of addressing excessive indebtedness, Chapter 5 outlined the only four paths governments can choose when dealing with excessive indebtedness, as articulated by the Debt Super Cycle Theory. To recap, the four paths are growing out of the debt, the austerity path, inflating away the debt or defaulting on the debt. As Complexity Theory outlines, it is impossible to predict when the US will not be able to continue to kick the can down the road with regard to addressing the growing indebtedness. Therefore the tough decisions that eventually will need to be made may transpire under President Trump's presidency or under another president. As a result, it is impossible to precisely predict which

path the US government will ultimately pursue to address the debt crisis as it is not clear who will be in power. However, it is possible to distinguish which of the four paths is more likely to be pursued.

As was discussed in Chapter 5, growing out of the debt is by far the most attractive option but also the hardest to implement. If this policy can be achieved, the US dollar's role as the sole key reserve currency will likely only increase in importance. However, this option requires being proactive before the debt crisis develops. Based on President Trump's first nine months in office, there appears to be little willingness and concrete evidence to suggest the Trump administration is going to be able to grow the debt problem away as was discussed in Chapter 5. Defaulting on the debt will all but guarantee the US dollar's role as the sole key reserve currency will end. Therefore it is the least likely of the paths to be pursued as the other options are less economically destructive. If the growth path fails, the only other two options available to deal with excessive indebtedness is strict austerity or inflating away the debt.

If inflation can stay in the 3–5% range, then inflating away the debt is an attractive option when compared to strict austerity, which is politically very difficult to implement for leaders wanting to be re-elected. Expressed differently, the negative impact of cutting someone's social security is a lot more apparent to households compared to experiencing a 2–3% decrease in their real income which is not easily noticed. However, inflation can be hard to manage, particularly when you are trying to engineer inflation. As a result, there is the real possibility that high levels of inflation will lead to the demise of the US dollar's ability to function as the sole key reserve currency.

Strict austerity by definition is all but certain to be economically painful. However, a government cutting costs and prioritising the payments of debt is viewed by markets favourably. Therefore, with the risk of default lower, the confidence in the underlining value of the currency improves, which ultimately means confidence in the US dollar's ability to function as a key reserve currency remains. Therefore, assuming that the main goal is to ensure that the US dollar remains as the sole key reserve currency, the inflation path is the higher risk, higher reward option compared to the strict austerity option, which is the safer but more certain to be economically and politically painful.

Summing up this point, while it's impossible to predict which of the four options will be chosen, likely the growth option will fail to prevent a debt crisis. Therefore either inflating away the debt or implementing strict austerity will have to be the way forward to deal with the

excessive indebtedness. Both options have merits and shortcomings. If the US government wants to do ‘whatever it takes’ to restore faith in the US dollar value, strict austerity is the best option to take. However, the inflation option could be a path that enables the real value of debt to decrease, ensure the US dollar remains the key reserve currency and inflict less economic pain compared to strict austerity. This tough economic decision cannot be taken lightly as it will have far reaching impacts regardless of which path is chosen. However, this decision can have a successful outcome in which excessive indebtedness does not have long term irreputable impacts on the US dollar’s status of being the sole key reserve currency.

The second decision, or indecision that has to be made, is what the future of the US dollar will look like. As was discussed in Chapter 6, both the Chinese and the Russians are already starting to circumnavigate the use of the US dollar when conducting global trade. Additionally, it is evident that both China and Russia are amassing substantial amounts of physical gold and have expressed interest in exploring cyber currencies. As a result, the US should not take these developments lightly. Essentially, the US can be proactive or reactive. Being proactive means the US will acknowledge that the US dollar in its fiat form cannot remain indefinitely as the key reserve currency. As has been discussed throughout this thesis, this is largely due to its sovereign debt level and the monetary policies that have been implemented by the Federal Reserve.

Acknowledging the fiat US dollar can’t remain indefinitely as the key reserve currency is the first step. The US then needs to ultimately transform the dollar into an intrinsically backed currency. This likely means either backed by gold or backed by block chain technology in the form of a cyber currency. The best way to do this would be in a Bretton Woods 2.0 style global monetary conference with all the key economies of the world. While China, and Russia to a smaller degree, would both require concessions in order for them to have more say and influence globally, the US would have first mover advantage and likely would still be able to assert enough influence to ensure the US dollar remains a key element of a new reserve currency system.

If the US chooses not to transform the fiat US dollar and lets China and Russia make the first move, the outcome for the US dollar’s long-term role is less certain. In this environment the US would have to react to China and Russia’s actions. For example, if the Chinese and Russians both announce that they will be placing their currencies on a gold standard, the US will have to do the same if they want the US dollar to remain a key global reserve currency long term.

This is because in the world of excessive indebtedness where governments can default, having a currency backed intrinsically becomes more valuable. While the US dollar, in this environment, would likely still remain a key global reserve currency long-term, it likely would not be the sole key reserve currency and the terms of the new global monetary order likely would not be as favourable if the US spearheaded the change.

In saying the above, the US should be pragmatic and realise that China is a growing economic superpower that eventually will reach economic parity with the US. Consequently, the best the US should hope for long term is the US dollar and the Chinese yuan both being the two key reserve currencies of the future. As a result, the US dollar having a near monopoly on reserve currency status, which it has enjoyed since World War II, will likely eventually end considering the qualitative and quantitative data covered in this thesis.

However, as was outlined in Chapter 1, the rise of a new global reserve currency is generally a multi-decade process. Additionally, in the decades of transition, such as between the Spanish silver and Dutch guilder, both currencies can be considered key reserve currencies. Therefore, while nothing is guaranteed, it would not be surprising in 20 years for the US dollar and the Chinese yuan to each comprise 30–40% of total global reserves with all other minor reserve currencies comprising 20–30% of total global reserves. What will largely determine how quick this transpires is how the US addresses its sovereign debt and what decision or indecision the US makes to its fiat US dollar.

In conclusion to this thesis, the key finding is that in its current fiat form, in which 64% of all global reserves are US dollars, it is highly unlikely long term the US dollar will remain the sole key reserve currency. In saying this, it likely will remain either the first or second most important key reserve currency in a duplicity/multiplicity key reserve currency world based on the likely long-term impacts of the two key risks identified. The first risk of excessive indebtedness if managed properly should not have an irreparable impact on the US dollar acting as the sole key reserve currency. However, the second risk of rising future currencies is going to be a greater challenge for the US. This is because even if the US does everything right to mitigate this risk, the US, short of war or China suffering a severe domestic crisis of some form, cannot stop China, and to a smaller degree Russia, from wanting and achieving greater influence economically in the world in the form of their currencies acting as reserve currencies.

Reference List

- American Society of Civil Engineers. (2017). America's Infrastructure Scores a D+. Retrieved From <https://www.infrastructurereportcard.org/>.
- Armstrong Economics. (2016). China CIPS vs Western SWIFT System. Retrieved From <https://www.armstrongeconomics.com/international-news/china/china-cips-v-western-swift-system/>.
- Bank of England. (2015). What is quantitative easing? Retrieved From <http://www.bankofengland.co.uk/monetarypolicy/pages/qe/default.aspx>.
- Bank of England. (2017). Monetary Policy Framework. Retrieved From <http://www.bankofengland.co.uk/monetarypolicy/Pages/framework/framework.aspx>.
- Bank of England (2016). QE: The story so far. Retrieved From <http://www.bankofengland.co.uk/research/Documents/workingpapers/2016/swp624slides.pdf>.
- Bank of International Settlements. (2016). Triennial Central Bank Survey Foreign exchange turnover in April 2016. Retrieved From <https://www.bis.org/publ/rpx16fx.pdf>.
- Bank of Japan. (2013). "Price Stability Target" of 2 Percent and "Quantitative and Qualitative Monetary Easing with Yield Curve Control". Retrieved From <https://www.boj.or.jp/en/mopo/outline/qqe.htm/>.
- Bank of Japan. (2017). BOJ Time Series Data Search. Retrieved From [https://www.stat-search.boj.or.jp/ssi/cgi-bin/famecgi2?cgi=\\$graphwnd_en](https://www.stat-search.boj.or.jp/ssi/cgi-bin/famecgi2?cgi=$graphwnd_en).
- BBC. (2011). Bank of Japan increases stimulus and keeps rates low. Retrieved From <http://www.bbc.com/news/business-15472839>.
- BBC. (2011). Credit agency warning for most of eurozone including Germany. Retrieved From <http://www.bbc.com/news/av/business-16043266/credit-agency-warning-for-most-of-eurozone-including-germany>.
- BBC. (2012). China buying oil from Iran with yuan. Retrieved From <http://www.bbc.com/news/business-17988142>.
- BBC. (2013). The Fragile Five. Retrieved From <http://www.bbc.com/news/business-24280172>.
- BBC. (2016). US leaving TPP: A great news day for China. Retrieved From <http://www.bbc.com/news/world-asia-china-38060980>.
- BBC. (2017). Federal Reserve raises rates for second time this year. Retrieved From <http://www.bbc.com/news/business-40282066>.
- Bergsten, C, F. (2009). The Dollar and the Deficits: How Washington Can Prevent the Next Crisis. *Foreign Affairs*, 88(6), 20-38. Retrieved from EBSCOhost.
- Bhat, P. (2013). Yuan: Towards an International Reserve Currency. *India Quarterly*, 69(3), 249-263. DOI: 10.1177/0974928413489467.

- Blackwill, R., Harris, J. (2016). War by Other Means: Geoeconomics and Statecraft. Boston, United States: Belknap Press: An Imprint of Harvard University Press.
- Bloomberg. (2011). Yen-Yuan Trade Plan to Cut Dollar Dependence of China, Japan. Retrieved From <https://www.bloomberg.com/news/articles/2011-12-25/china-japan-to-promote-direct-trading-of-currencies-to-cut-company-costs>.
- Bloomberg. (2013). Rosneft's \$270 Billion Oil Deal Set to Make China Biggest Market. Retrieved From <https://www.bloomberg.com/news/articles/2013-06-21/rosneft-s-270-billion-oil-deal-set-to-make-china-biggest-market>.
- Bloomberg. (2016). India's Misguided War on Cash. Retrieved From <https://www.bloomberg.com/view/articles/2016-11-22/india-s-misguided-war-on-cash>.
- Bloomberg. (2016). Citi Stockpiles 'Weapons of Mass Destruction'. Retrieved From <https://www.bloomberg.com/gadfly/articles/2016-08-08/citigroup-stockpiles-weapons-of-mass-destruction>.
- Bloomberg. (2016). Gold Standard Approved for Islamic Finance, Opening New Market. Retrieved From <https://www.bloomberg.com/news/articles/2016-12-05/gold-standard-approved-for-islamic-finance-opening-new-market-iwbytkoj>
- Bloomberg. (2017). Why the Bank of Japan Needs a Fed-Style Dot Plot. Retrieved From <https://www.bloomberg.com/news/articles/2017-03-28/boj-needs-rate-guidance-for-better-signaling-says-ex-official>.
- Bloomberg. (2017). The Bank of England Risks Forgetting Its History. Retrieved From <https://www.bloomberg.com/gadfly/articles/2017-06-22/boe-policy-error>.
- Bloomberg. (2017). China Is Developing its Own Digital Currency. Retrieved From <https://www.bloomberg.com/news/articles/2017-02-23/pboc-is-going-digital-as-mobile-payments-boom-transforms-economy>.
- Bloomberg. (2017). Bannon's Plan to Tax Top Earners 44% to Be Considered by GOP. Retrieved From <https://www.bloomberg.com/news/articles/2017-07-27/bannon-s-plan-to-tax-top-earners-is-said-to-be-considered-by-gop>.
- Bloomberg. (2017). Draghi Dials Down ECB Stimulus as QE's Distant Fate Debated. Retrieved From <https://www.bloomberg.com/news/articles/2017-03-30/draghi-dials-down-ecb-stimulus-as-qe-s-distant-future-debated>.
- Bloomberg. (2017). French Economic Growth Deals Macron Tailwind for Reforms. Retrieved From <https://www.bloomberg.com/news/articles/2017-07-28/french-economic-growth-deals-macron-tailwind-in-effort-to-reform>.
- Bloomberg. (2017). Spain's Return from the Periphery. Retrieved From <https://www.bloomberg.com/gadfly/articles/2017-05-23/spain-bonds-are-on-the-way-back-from-the-periphery>.
- Bloomberg. (2017). Trump Says U.S. Can No Longer Accept Crumbling Infrastructure. Retrieved From <https://www.bloomberg.com/news/articles/2017-06-07/trump-to-outline-infrastructure-plan-that-includes-rural-funding>.

- Bloomberg. (2017). Americans Say They Back Higher Gas Tax to Fix Crumbling Roads. Retrieved From <https://www.bloomberg.com/news/articles/2017-07-20/americans-say-they-back-higher-gas-tax-to-fix-crumbling-roads>.
- Bloomberg. (2017). China Set to Expand Opening to \$9 Trillion Bond Market. Retrieved From <https://www.bloomberg.com/news/articles/2017-06-27/china-s-next-global-market-integration-target-looms-in-bonds>.
- Bordo, M., McCauley, R. (2016). The Current Account Version of the Triffin Dilemma. *Atlantic Economic Journal*, 44(2), 171-182. DOI: 10.1007/s11293-016-9499-1.
- Brainyquote. (2017). Friedrich August von Hayek Quotes. Retrieved From <https://www.brainyquote.com/quotes/quotes/f/friedricha201835.html>.
- BRICS Business Council. (2017). Russia's Central Bank to Develop National Cryptocurrency. Retrieved From <http://www.brics-info.org/russias-central-bank-to-develop-national-cryptocurrency/>.
- Brooks, S., Wohlforth, W. (2016). The Once and Future Superpower: Why China Won't Overtake the United States. *Foreign Affairs*, 95(3), 91-104. Retrieved From Proquest.
- Bruegel. (2016). The European Central Bank's quantitative easing programme: limits and risks. Retrieved From <http://bruegel.org/2016/02/the-european-central-banks-quantitative-easing-programme-limits-and-risks/>
- Bulkot, O. (2013). Currency Multipolarity in the System of Global Finance. *Ekonomik*, 11(153), 6-9. DOI: 10.17721/1728-2667.2013/153-12/.
- Business Insider. (2016). China's yuan officially joins the SDR. Retrieved From <https://www.businessinsider.com.au/chinese-yuan-officially-joins-the-imfs-sdr-2016-10?r=US&IR=T>.
- Business Insider. (2017). The first investor in Snapchat thinks bitcoin could realistically be worth \$500,000 by 2030. <https://www.businessinsider.com/bitcoin-price-could-be-500000-by-2030-first-snapchat-investor-says-2017-3#Ip9hhsL9LiabFvRX.99>.
- Business Insider. (2017). MOODY'S: The UK risks a credit downgrade if Brexit trade talks fail. Retrieved From <https://www.businessinsider.com/moodys-brexit-trade-uk-credit-rating-2017-7#eKusdX637IaTC0qC.99>.
- Business Insider. (2017). ALAN GREENSPAN: 'The eurozone is not working'. Retrieved From <https://www.businessinsider.com/former-federal-reserve-chairman-alan-greenspan-on-the-eurozone-2017-2#jOSlobM2TzWdFbo2.99>.
- Carbaugh, R., Hedrick, D. (2008). Losing Faith in the Dollar: Can It Remain the World's Dominant Reserve Currency? *Challenge*, 51(3), p.93-109. Retrieved from EBSCO Database.
- Chanda, N. (2013). When China Slows Down. *New Perspectives Quarterly*, 30(1), 54. DOI: 10.1111/npqu.11359.
- Charts. (2017). The Bitcoin ecosystem at a glance. Retrieved From <https://charts.bitcoin.com/>.

- Chey, H. K. (2012). 'Theories of international currencies and the future of the world monetary order', *International Studies Review* 14(1), 51–77. DOI: 10.1111/j.1468-2486.2012.01104.x
- China Daily. (2013). Stop rocking the boat. Retrieved From http://usa.chinadaily.com.cn/opinion/2013-10/10/content_17019195.htm.
- China Daily. (2009). Reform international monetary system. Retrieved From http://www.chinadaily.com.cn/opinion/2009-03/25/content_7612847.htm.
- Chinn, M., Frankel, J. (2005). Will the Euro Eventually Surpass the Dollar as Leading International Reserve Currency? NBER Working Paper Series, 115-120. DOI: 10.3386/w11510.
- Chinn, M. (2015). Emerging Market Economies and the Next Reserve Currencies. *Open Economies Review*, 26(1), 155-174. DOI: 10.1007/s11079-014-9336-6.
- Chong, F. (2013). Is RMB approaching safe haven status? *Asia Today International*, Jun, 31(3), 5-11. Retrieved from RMIT Publishing.
- CNBC. (2012). Gross: U.S. Still 'Cleanest Dirty Shirt'. Retrieved From <https://www.cnbc.com/video/2012/06/28/gross-u-s-still-cleanest-dirty-shirt.html>.
- CNBC. (2013). Financial crisis was a 100-year storm: Hank Paulson. Retrieved From <https://www.cnbc.com/id/101032241>.
- CNBC. (2015). How the Fed screwed up the bond market. Retrieved From <https://www.cnbc.com/2015/06/11/how-the-fed-screwed-up-the-bond-market.html>.
- CNBC. (2015). ECB to extend QE until at least March 2017, buy regional government bonds. Retrieved From <https://www.cnbc.com/2015/12/03/ecb-keeps-main-rate-at-005-pushes-deposit-rate-to-03.html>.
- CNBC. (2015). Open-ended European QE starts 'with a bang'. Retrieved From <https://www.cnbc.com/2015/01/22/ecb-holds-rates-markets-on-edge-on-qe-hopes.html>.
- CNBC. (2016). Bank of Japan could be the first to adopt 'helicopter money' policy. Retrieved From <http://www.cnbc.com/2016/06/30/bank-of-japan-could-be-the-first-to-embark-on-helicopter-money-policy.html>.
- CNBC. (2016). Ed Yardeni: The bond vigilantes are 'back — as zombies!' Retrieved From <https://www.cnbc.com/2016/11/18/ed-yardeni-the-bond-vigilantes-are-back--as-zombies.html>.
- CNBC. (2016). China markets close up as Japan, Australia near bear markets. Retrieved From <https://www.cnbc.com/2016/01/17/asia-stock-markets-set-to-slide-on-us-europe-sell-off-china-in-focus.html>.
- CNBC. (2016). Social Security's looming \$32 trillion shortfall. Retrieved From <https://www.cnbc.com/2016/08/08/social-securitys-looming-32-trillion-shortfall.html>.

- CNBC. (2016). It's time for the word to end its debt-fueled growth model: BIS. Retrieved From <https://www.cnbc.com/2016/06/22/bis-its-time-for-the-word-to-end-its-debt-fueled-growth-model.html>.
- CNBC. (2016). US oil reserves surpass those of Saudi Arabia and Russia. Retrieved From <https://www.cnbc.com/2016/07/05/us-oil-reserves-surpass-those-of-saudi-arabia-and-russia.html>.
- CNBC. (2016). US companies are hoarding \$2.5 trillion in cash overseas. Retrieved From <https://www.cnbc.com/2016/09/20/us-companies-are-hoarding-2-and-a-half-trillion-dollars-in-cash-overseas.html>.
- CNBC. (2016). Bond market is in an 'epic bubble of colossal proportions,' says Boockvar. Retrieved From <https://www.cnbc.com/2016/07/06/bond-market-is-in-an-epic-bubble-of-colossal-proportions-says-boockvar.html>.
- CNBC. (2016). China launches yuan gold fix in bid to be price maker. Retrieved From <https://www.cnbc.com/2016/04/19/china-launches-yuan-gold-fix-in-bid-to-be-price-maker.html>.
- CNBC. (2017). The top 10 most indebted states in the US. Retrieved From <https://www.cnbc.com/2017/05/02/the-top-10-most-indebted-states-in-the-us.html>.
- CNBC. (2017). CBO: Obamacare repeal bill would raise number of uninsured by 32 million by 2026. Retrieved From <https://www.cnbc.com/2017/07/19/cbo-obamacare-repeal-bill-would-raise-number-of-uninsured-by-27-million-by-2020.html>.
- CNBC. (2017). The US 'debt bomb is going to explode,' strategist Peter Schiff says. Retrieved From <https://www.cnbc.com/2017/01/26/the-us-debt-bomb-is-going-to-explode-strategist-peter-schiff-says.html>.
- CNBC. (2017). Goldman says this may become the longest economic expansion in history. Retrieved From <https://www.cnbc.com/2017/05/08/goldman-says-u-s-economy-may-be-slowly-growing-into-the-longest-expansion-in-history.html>.
- CNBC. (2017). Trump's budget seeks to eliminate one major benefit of federal student loans that costs billions. Retrieved From <https://www.cnbc.com/2017/05/24/trumps-budget-seeks-to-cut-one-major-benefit-of-federal-student-loans.html>.
- CNBC. (2017). Trump's hope for 3% growth no longer looks so far-fetched. Retrieved From <https://www.cnbc.com/2017/08/30/trumps-hope-for-3-percent-growth-no-longer-looks-so-far-fetched.html>.
- CNBC. (2017). S&P cuts Illinois' credit rating to one notch above junk. Retrieved From <https://www.cnbc.com/2017/06/01/reuters-america-sp-cuts-illinois-credit-rating-to-one-notch-above-junk.html>.
- CNBC. (2017). Bitcoin could hit \$100,000 in 10 years, says the analyst who correctly called its \$2,000 price. Retrieved From <https://www.cnbc.com/2017/05/31/bitcoin-price-forecast-hit-100000-in-10-years.html>.

- CNBC. (2017). French political turmoil clouds Moody's ratings review. Retrieved From <https://www.cnbc.com/2017/02/10/french-political-turmoil-clouds-moodys-review.html>.
- CNBC. (2017). Fed sets process to wind down \$4.5 trillion balance sheet. Retrieved From <https://www.cnbc.com/2017/05/24/fed-sets-process-to-unravel-4-point-5-trillion-balance-sheet.html>.
- CNBC. (2017). Bank of Japan keeps monetary policy steady, cuts inflation expectations. Retrieved From <https://www.cnbc.com/2017/07/19/bank-of-japan-monetary-policy-statement.html>.
- CNBC. (2017). ECB to extend QE into 2019, says SocGen. Retrieved From <https://www.cnbc.com/2017/06/12/ecb-to-extend-qe-into-2019-says-socgen.html>.
- CNBC. (2017). ECB sends a dovish message but markets don't buy it. Retrieved From <https://www.cnbc.com/2017/07/20/ecb-holds-interest-rates-steady-as-traders-eye-draghi-qe-tapering.html>.
- CNBC. (2017). ECB should have already started raising interest rates, Rabobank chairman says. Retrieved From <https://www.cnbc.com/2017/06/26/ecb-should-have-already-started-raising-interest-rates-rabobank-chairman-says.html>.
- CNBC. (2017). I wouldn't rule out another financial crisis, says IMF's Lagarde. Retrieved From <http://www.cnbc.com/2017/07/12/imf-lagarde-financial-crisis-janet-yellen.html>.
- CNBC. (2017). Russia readying first yuan-denominated OFZ bonds - cbank dep gov. Retrieved From <https://www.cnbc.com/2017/03/16/reuters-america-update-2-russia-readying-first-yuan-denominated-ofz-bonds--cbank-dep-gov.html>.
- CNBC. (2017). In BOJ minutes, members contest disclosure of exit strategy impact. Retrieved From <https://www.cnbc.com/2017/07/24/in-boj-minutes-members-contest-disclosure-of-exit-strategy-impact.html>
- CNBC. (2017). 3 ways to invest like Warren Buffett. Retrieved From <http://www.cnbc.com/2017/02/26/3-ways-to-invest-like-warren-buffett.html?view=story&%24DEVICE%24=native-android-mobile>.
- CNBC. (2017). This is one of the world's most dangerous places to mine bitcoin. Retrieved From <https://www.cnbc.com/2017/08/30/venezuela-is-one-of-the-worlds-most-dangerous-places-to-mine-bitcoin.html>.
- CNBC. (2017). Markets doubt future rate hikes, disagree with Fed's glass-half-full view of economy. Retrieved From <https://www.cnbc.com/2017/06/14/markets-doubt-future-rate-hikes-disagree-with-feds-glass-half-full-view-of-economy.html>.
- CNBC. (2017). China's ICBC Doha clears more than \$86 bln in yuan transactions. Retrieved From <https://www.cnbc.com/2017/04/26/reuters-america-chinas-icbc-doha-clears-more-than-86-bln-in-yuan-transactions.html>.

- CNBC. (2017). Billionaire investor Marks, who called the dotcom bubble, says bitcoin is a 'pyramid scheme'. Retrieved From <https://www.cnbc.com/2017/07/26/billionaire-investor-marks-who-called-the-dotcom-bubble-says-bitcoin-is-a-pyramid-scheme.html>.
- CNBC. (2017). Mark Cuban, who just called bitcoin a bubble, says he plans to invest in another digital coin. Retrieved From <https://www.cnbc.com/2017/06/29/mark-cuban-who-just-called-bitcoin-a-bubble-says-he-plans-to-invest-in-another-digital-coin.html>.
- CNN. (2010). Greek crisis fears deepen. Retrieved From http://money.cnn.com/2010/04/28/news/international/greek_bonds/.
- CNN. (2017). The CBO thinks Trump's budget math is about \$3.4T off. Retrieved From <http://edition.cnn.com/2017/07/14/politics/cbo-trump-budget-math/index.html>.
- CNN. (2017). Trump's trillion-dollar infrastructure plan -- jobs boost or giveaway? Retrieved From <http://edition.cnn.com/2017/06/13/opinions/trump-infrastructure-economy-opinion-holtz-eakin/index.html>.
- CNN. (2017). A complete failure of Trump's leadership. Retrieved From <http://edition.cnn.com/2017/07/28/opinions/trump-complete-failure-of-leadership-opinion-zelizer/index.html>.
- Coinmarketcap. (2017). CryptoCurrency Market Capitalizations. Retrieved From <https://coinmarketcap.com/all/views/all/>.
- Committee for a Responsible Federal Budget. (2017). President Trump's Full FY 2018 Budget. Retrieved From <http://www.crfb.org/papers/president-trumps-full-fy-2018-budget>.
- Commonwealth Bank. (2012). The ECB's Securities Market Program (SMP) – about to restart bond purchases? Retrieved From <https://www.commbank.com.au/corporate/research/publications/economics/economic-issues/international/2012/180612-ECB.pdf>.
- Conway, E. (2016). *The Summit: Bretton Woods, 1944: J. M. Keynes and the Reshaping of the Global Economy*. New York City, United States: Pegasus Books.
- Costigan, T., Cottle, D., Keys, A. (2017). The US Dollar as the Global Reserve Currency: Implications for US Hegemony. *World Review of Political Economy*, 8(1), 104-122. DOI: 10.13169/worlrevipoliecon.8.1.0104.
- Cox, M. (2012). "Power Shifts, Economic Change and the Decline of the West?" *International Relations*, 26(4), 369-88. DOI: 10.1177/0047117812461336.
- Dailami, M., Masson, P. (2010). Toward a More Managed International Monetary System? *International Journal*, 65(2), 393-409. DOI: 10.1177/002070201006500211.
- D'arista, J. (2004). Dollars, Debt, and Dependence: The Case for International Monetary Reform. *Journal of Post Keynesian Economics*, 26(4), 557-72. Retrieved from JSTOR Database.
- Economic History. (2003). The Dutch Economy in the Golden Age (16th – 17th Centuries). Retrieved From <https://eh.net/encyclopedia/the-dutch-economy-in-the-golden-age-16th-17th-centuries/>.

- Eichengreen, B. (2012). When Currencies Collapse: Will We Replay the 1930s or the 1970s? *Foreign Affairs*, 91(1), 117-134. Retrieved From EBSCOhost.
- El-Erian, M. (2016). *The Only Game in Town: Central Banks, Instability and Avoiding the Next Collapse*. New York City, United States: Random House.
- Energy Information Administration. (2016). U.S. Crude Oil and Natural Gas Proved Reserves, Year-end 2015. Retrieved From <https://www.eia.gov/naturalgas/crudeoilreserves/>.
- Eurofund. (2016). Greece: Reducing the number of public servants – latest developments. Retrieved From <https://www.eurofound.europa.eu/observatories/emcc-eurwork/articles/working-conditions-labour-market-industrial-relations/greece-reducing-the-number-of-public-servants-latest-developments>.
- European Central Bank. (2010). Driven by the markets? ECB sovereign bond purchases and the Securities Markets Programme. Retrieved From <http://www.europarl.europa.eu/document/activities/cont/201006/20100610ATT75796/20100610ATT75796EN.pdf>.
- European Central Bank. (2012). Technical features of Outright Monetary Transactions. Retrieved From https://www.ecb.europa.eu/press/pr/date/2012/html/pr120906_1.en.html.
- European Central Bank. (2012). Verbatim of the remarks made by Mario Draghi. Retrieved From <https://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html>.
- European Central Bank. (2013). Outright Monetary Transactions, one year on. Retrieved From <https://www.ecb.europa.eu/press/key/date/2013/html/sp130902.en.html>.
- European Central Bank. (2017). Annual consolidated balance sheet of the Euro system. Retrieved From <https://www.ecb.europa.eu/pub/annual/balance/html/index.en.html>.
- European Central Bank. (2017). The definition of price stability. Retrieved From <https://www.ecb.europa.eu/mopo/strategy/pricestab/html/index.en.html>.
- European Central Bank. (2017). Key ECB interest rates. Retrieved From https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html.
- European Commission. (2017). EU-China: Trade. Retrieved From <http://ec.europa.eu/trade/policy/countries-and-regions/countries/china/>.
- Eurostat. (2017). General government gross debt - annual data. Retrieved From <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=teina225>.
- Federal Budget. (2017). The U.S. Federal Budget. Retrieved From <http://federal-budget.insidegov.com/>.
- Federal Reserve Bank of San Francisco. (2006). Did Quantitative Easing by the Bank of Japan “Work”? Retrieved From <http://www.frbsf.org/economic-research/publications/economic-letter/2006/october/did-quantitative-easing-by-the-bank-of-japan-work/>.

- Federal Reserve. (2015). Why does the Federal Reserve aim for 2 percent inflation over time? Retrieved From https://www.federalreserve.gov/faqs/economy_14400.htm.
- Federal Reserve. (2017). Addendum to the Policy Normalization Principles and Plans. Retrieved From <https://www.federalreserve.gov/newsevents/pressreleases/files/monetary20170614c1.pdf>.
- Federal Reserve Economic Data. (2017). Interest Rates, Discount Rate for United States. Retrieved From <https://fred.stlouisfed.org/series/INTDSRUSM193N>.
- Federal Reserve Economic Data. (2017). Gold Fixing Price 10:30 A.M. (London time) in London Bullion Market, based in U.S. Dollars. Retrieved From <https://fred.stlouisfed.org/series/GOLDAMGBD228NLBM>.
- Federal Reserve Economic Data. (2017). Inflation, consumer prices for the United States. Retrieved From <https://fred.stlouisfed.org/series/FPCPITOTLZGUSA>.
- Federal Reserve Economic Data. (2017). Long-Term Government Bond Yields: 10-year: Main (Including Benchmark). Retrieved From <https://fred.stlouisfed.org/series/IRLTLT01ITM156N>.
- Federal Reserve Economic Data. (2017). Long-Term Government Bond Yields: 1-year: Main (Including Benchmark). Retrieved From <https://fred.stlouisfed.org/series/IRLTLT01ITM156N>.
- Federal Reserve Economic Data. (2017). Amount Outstanding of Total Debt Securities in General Government Sector, All Maturities, Residence of Issuer. Retrieved From <https://fred.stlouisfed.org/series/TDSAMRIAOGGIT#0>.
- Federal Reserve Economic Data. (2017). St. Louis Adjusted Monetary Base. Retrieved From <https://fred.stlouisfed.org/series/BASE>.
- Federal Reserve Economic Data. (2017). Effective Federal Funds Rate. Retrieved From <https://fred.stlouisfed.org/series/FEDFUNDS>.
- Federal Reserve Economic Data. (2017). M2 Money Stock. Retrieved From <https://fred.stlouisfed.org/series/M2>.
- Federal Reserve Economic Data. (2017). Velocity of M1 Money Stock. Retrieved From <https://fred.stlouisfed.org/series/M1V>.
- Federal Reserve Economic Data. (2017). Velocity of M2 Money Stock. Retrieved From <https://fred.stlouisfed.org/series/M2V>.
- Federal Reserve History. (2013). Nixon Ends Convertibility of US Dollars to Gold and Announces Wage/Price Controls. Retrieved From <http://www.federalreservehistory.org/Events/DetailView/33>.
- Federal Reserve History. (2013). Establishment of the Bretton Woods System. Retrieved From <http://www.federalreservehistory.org/Events/DetailView/28>.

- Federal Reserve. (2017). Quarterly Report on Federal Reserve Balance Sheet Developments Retrieved From <https://www.federalreserve.gov/monetarypolicy/quarterly-balance-sheet-developments-report.htm>.
- Ferguson. (2002). Empire: The Rise and Demise of the British World Order and the Lessons For Global; Power. London, England: Penguin Books Ltd.
- Ferguson, N. (2009). The Ascent of Money: A Financial History of The World. New York City, United States: Penguin Group.
- Financial Times. (2010). The G20 must look beyond Bretton Woods II. Retrieved From <https://www.ft.com/content/5bb39488-ea99-11df-b28d-00144feab49a?mhq5j=e6>.
- Financial Times. (2011). Bank of England increases QE by £75bn. Retrieved From <https://www.ft.com/content/19dcb802-f004-11e0-bc9d-00144feab49a>.
- Financial Times. (2013). Ben Bernanke says bond buying could slow. Retrieved From <https://www.ft.com/content/35b7c810-c2e8-11e2-bbbd-00144feab7de>.
- Financial Times. (2015). White House declares truce with China over AIIB. Retrieved From <https://www.ft.com/content/23c51438-64ca-11e5-a28b-50226830d644>.
- Financial Times. (2015). People's quantitative easing — no magic. Retrieved From <https://www.ft.com/content/c1060fb0-41b4-11e5-b98b-87c7270955cf>.
- Financial Times. (2015). China Launch of renminbi payments system reflects Swift spying concerns. Retrieved From <https://www.ft.com/content/84241292-66a1-11e5-a155-02b6f8af6a62?mhq5j=e6>.
- Financial Times. (2016). ECB prolongs QE but at lower level of €60bn a month. Retrieved From <https://www.ft.com/content/db64606a-bd3b-11e6-8b45-b8b81dd5d080>.
- Financial Times. (2016). The BoE's new £100bn bazooka? What is the Term Funding Scheme? Retrieved From <https://www.ft.com/content/a17d8ff4-864a-3a34-84d8-a7c5c128d7fe>.
- Financial Times. (2016). Bill Gross warns over \$10tn negative-yield bond pile. Retrieved From <https://www.ft.com/content/995da266-2e62-11e6-bf8d-26294ad519fc>.
- Financial Times. (2016). German bank charges negative rates on large deposits. Retrieved From <https://www.ft.com/content/39b009c6-5fc2-11e6-b38c-7b39cbb1138a>.
- Financial Times. (2017). Call for transparency on ECB corporate bond buying. Retrieved From <https://www.ft.com/content/7d1eea08-3be8-11e7-ac89-b01cc67cfeec>.
- Financial Times. (2017). Spain: Boom to bust and back again. Retrieved From <https://www.ft.com/content/254bb8a8-1940-11e7-a53d-df09f373be87>.
- Financial Times. (2017). Italy credit rating cut to 'BBB' at Fitch. Retrieved From <https://www.ft.com/content/39cf2d87-751c-3f86-a35b-6bc435933d47>.
- Financial Times. (2017). S&P raises outlook on Spain's credit rating. Retrieved From <https://www.ft.com/content/113a64bd-5a25-3dfb-8b29-70089b84f9b3>.

- Fisher, I. (1933). *The Debt-Deflation Theory of Great Depressions*. Cleveland, United States: Econometric Society.
- Forbes. (2010). *The End Game Of The Debt Super cycle*. Retrieved From <https://www.forbes.com/sites/investor/2010/07/19/the-end-game-of-the-debt-supercycle/#6f3660ab6691>.
- Forbes, S., & Ames, E. (2014). *Money: How the Destruction of the Dollar Threatens the Global Economy and what we can do about it*. Chicago, United States: McGraw Hill Education.
- Forbes. (2015). *Quantitative Easing In Focus: The U.S. Experience*. Retrieved From <https://www.forbes.com/sites/greatspeculations/2015/11/16/quantitative-easing-in-focus-the-u-s-experience/#2d2137e2528d>.
- Forbes. (2016). *China Is Laying The Foundation For The Next World Gold Standard System*. Retrieved From <https://www.forbes.com/sites/nathanlewis/2016/05/05/china-is-laying-the-foundation-for-the-next-world-gold-standard-system/#63e3320689e3>.
- Forbes. (2017). *Iran To Ditch The Dollar In Wake Of Trump's 'Muslim Ban'*. Retrieved From <https://www.forbes.com/sites/dominicdudley/2017/01/30/iran-to-ditch-dollar/#66c4a7b76715>.
- Foreign Policy Journal. (2016). *Hillary Emails Reveal True Motive for Libya Intervention*. Retrieved From <https://www.foreignpolicyjournal.com/2016/01/06/new-hillary-emails-reveal-true-motive-for-libya-intervention/>.
- Foucheéa, L. (1936). *The Origins and Early History of the Dutch East India Company. (1602-1652)*. *South African Journal of Economics* 4(4), 444-459. DOI: 10.1111/j.1813-6982.1936.tb02058.x.
- Galati, G., Wooldridge, P. (2009). *The euro as a reserve currency: a challenge to the pre-eminence of the US dollar?* *International Journal of Finance & Economics*,14(1), 1-23. DOI: 10.1002/ijfe.379.
- Gao, Y., Coffman, D. (2013). *Renminbi internationalization as a response to the global imbalance*. *Journal of Chinese Economic and Business Studies*, 11(2), 139-151. DOI: 10.1080/14765284.2013.789683.
- Gilder, G. (2016). *The Scandal of Money: Why Wall Street Recovers But the Economy Never Does*. Washington D.C., United States: Regnery Publishing.
- Graeber, D. (2014). *Debt: The First 5,000 Years*. Hoboken, United States: Melville House Publishing.
- Global Rates. (2017). *Central banks - summary of current interest rates*. Retrieved From <http://www.global-rates.com/interest-rates/central-banks/central-banks.aspx>.
- Global Research. (2017). *Yuan Clearing Bank Opens in Moscow as Russia, China Dump Dollar in Bilateral Trade*. Retrieved From <https://www.globalresearch.ca/yuan-clearing-bank-opens-in-moscow-as-russia-china-dump-dollar-in-bilateral-trade/5581733>.
- Gold Price. (2017). *Gold Price*. Retrieved From <https://goldprice.org/>.

- Greenspan, A. (1999). Controlling financial crisis: International: Currency reserves and debt. *Vital Speeches*, 65(15), 459-461. Retrieved from Proquest
- Gupta, S., Goyal, A. (2014). Reserve currencies: Can multiplicity work? IDEAS Working Paper Series. 1-40. Retrieved from Proquest.
- Haass, R. (2017). *A World in Disarray: American Foreign Policy and the Crisis of the Old Order*. New York City, United States: Penguin Press.
- Heldring, F. (1988). Can the U.S. Dollar Survive as a World Reserve Currency? *The ANNALS of the American Academy of Political and Social Science*, 500(1), 23-32. DOI: 10.1177/0002716288500001002.
- History. (1991). Exploration of North America. Retrieved From <http://www.history.com/topics/exploration/exploration-of-north-america>
- Historyworld. (2001). History of the Spanish Empire. Retrieved From <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?groupid=1734&HistoryID=ab49>rack=pthc>.
- Historyworld. (2001). History of Banking. Retrieved From <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?groupid=2453&HistoryID=ac19>rack=pthc>.
- Huffington Post. (2009). Credit Rating Agency Analysts Covering AIG, Lehman Brothers Never Disciplined. Retrieved From <http://www.huffingtonpost.com/2009/09/30/credit-rating-agency-anal n 305587.html>.
- Huffington Post. (2017). America's 4 Richest Families Own as Much as the Bottom 40%. Retrieved From http://www.huffingtonpost.com/max-galka/americas-4-richest-families-own-as-much-as-the-bottom-40_b_9259942.html.
- Institute for International Energy Research. (2013). Federal Assets Above and Below Ground. Retrieved From <http://instituteforenergyresearch.org/analysis/federal-assets-above-and-below-ground/>.
- Institute for International Finance. (2017). Global Debt Monitor - June 2017. Retrieved From <https://www.iif.com/publications/global-debt-monitor>.
- International Monetary Fund. (2009). IMF to Make \$250 Billion SDR Allocation on August 28. Retrieved From <http://www.imf.org/external/np/exr/cs/news/2009/cso79.htm>.
- International Monetary Fund. (2015). France: 2015 Article IV Consultation—Concluding Statement. Retrieved From <https://www.imf.org/en/News/Articles/2015/09/28/04/52/mcs051915>.
- International Monetary Fund. (2016). Special Drawing Right SDR. Retrieved From <http://www.imf.org/external/np/exr/facts/sdr.htm>.
- International Monetary Fund. (2016). World Currency Composition of Official Foreign Exchange Reserves. Retrieved From <http://data.imf.org/regular.aspx?key=41175>.

- International Monetary Fund. (2016). IMF Launches New SDR Basket Including Chinese Renminbi, Determines New Currency Amounts. Retrieved From <http://www.imf.org/en/News/Articles/2016/09/30/AM16-PR16440-IMF-Launches-New-SDR-Basket-Including-Chinese-Renminbi>.
- International Monetary Fund. (2017). Current Composition of Official Foreign Exchange Reserves. (COFER). Retrieved From <http://data.imf.org/regular.aspx?key=41175>.
- International Monetary Fund. (2017). Report for Selected Countries and Subjects. Retrieved From <http://www.imf.org/external/pubs/ft/weo/2017/01/weodata/weorept.aspx?pr.x=32&pr.y=19&sy=2015&ey=2016&scsm=1&ssd=1&sort=country&ds=.&br=1&c=512%>.
- International Monetary Fund. (2017). World Economic Outlook database. Retrieved From <https://www.imf.org/external/pubs/ft/weo/2017/01/weodata/download.aspx>.
- International Monetary Fund. (2017). General government net lending/borrowing. Retrieved From http://www.imf.org/external/datamapper/GGXCNL_NGDP@WEO/OEMDC/ADVEC/WEOWORLD.
- International Monetary Fund. (2017). Special Drawing Right SDR. Retrieved From <http://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/14/51/Special-Drawing-Right-SDR>.
- Investopedia. (2015). What is Zero Interest-Rate Policy (ZIRP)? Retrieved From <http://www.investopedia.com/articles/investing/031815/what-zero-interestrategy-policy-zirp.asp>.
- Investopedia. (2016). The Investing Risk Of Underfunded Pension Plans. Retrieved From <http://www.investopedia.com/articles/analyst/03/050803.asp>.
- Investing. (2017). Bond Yield Historical Data. Retrieved From <https://www.investing.com/rates-bonds/italy-10-year-bond-yield-historical-data>.
- Investopedia. (2017). The International Fisher Effect: An Introduction. Retrieved From <http://www.investopedia.com/articles/economics/10/international-fisher-effect.asp>.
- Investopedia. (2017). Reserve Currency. Retrieved From <http://www.investopedia.com/terms/r/reservecurrency.asp>.
- Investopedia. (2017). What are 'Futures'. Retrieved From <http://www.investopedia.com/terms/f/futures.asp>.
- Investopedia. (2017). What is the Quantity Theory of Money? Retrieved From <http://www.investopedia.com/articles/05/010705.asp>.
- Jacobs, L., King, D. (2016). Fed Power: How Finance Wins. New York City, United States: Oxford University.
- Jayakumar, V., Weiss, B. (2011). Global Reserve Currency System: Why Will the Dollar Standard Give Way to a Tripolar Currency Order? *Frontiers of Economics in China*, 206(1), 92-130. DOI: 10.1007/s11459-011-0124-6.

- Jordan, J. (2015). The Role of Gold in a Market-Based Monetary System. *Cato Journal*, 35(2), 233-250. Retrieved from Proquest.
- Katusa, M. (2015). *The Colder War: How the Global Energy Trade Slipped From America's Grasp*, New Jersey, United States: John Wiley & Sons.
- Keaney, M. (2017). The Buck Stops Here: The Return of US Decline. *World Review of Political Economy*, 8(2), 253-267. DOI: 10.13169/worlrevipoliecon.8.2.0253.
- Kelly, K. (2017). *The Inevitable. Understanding the 12 Technological Forces That Will Shape our Future*. New York City, United States: Penguin Books.
- King, M. (2016). *The End of Alchemy: Money, Banking, and the Future of the Global Economy*. London, United Kingdom: W.W. Norton & Company.
- Kissinger, H. (2015). *World Order*, New York City, United States: Penguin Books.
- Kovačević, R. (2014). Dollar as the world's reserve currency: Challenges and prospects. *Bankarstvo*, 43(6), 16-43. DOI: 10.5937/bankarstvo1406016K.
- Kristijan, G., Dejan, M. (2016). US Dollar Stability and the Global Currency Reserves. *Eurasian Journal of Economics and Finance*, 4(3), 14-24. DOI: 10.15604/ejef.2016.04.03.002.
- Kroeber, A, R. (2016). *China's Economy: What Everyone Needs To Know*. Oxford, United Kingdom: Oxford Press.
- Lai, P. (2015). Growth Slowdown in China since 2008: Will There Be a Hard Landing in the Near Future? *China & World Economy*, 23(3), 42-58. DOI: 10.1111/cwe.12113
- Larry Summers. (2017). What history tells us about Trump's budget fantasy. Retrieved From <http://larrysummers.com/2017/05/30/what-history-tells-us-about-trumps-budget-fantasy/>.
- Lee, J. (2014). Will the Renminbi Emerge as an International Reserve Currency? *World Economy*, January 37(1), 42-62. DOI: 10.1111/twec.12092.
- Liu, W., Deng, L. (2012). Who Is the Exchange Rate Manipulator: China or America? *World Review of Political Economy*, 3(3), 344-53. DOI: 10.13169/worlrevipoliecon.3.3.0344.
- Mallaby, S., Wethington, O. (2012). The Future of the Yuan: China's Struggle to Internationalize Its Currency. *Foreign Affairs*, 91(1), 135-146. Retrieved From EBSCOhost.
- Mastanduno, M. (2009). System Maker and Privilege Taker: U.S. Power and the International Political Economy. *World Politics*, 61(1), 121-54. DOI: 10.1017/S0043887109000057.
- Mattie, M. (2016). *The Global Addiction to QE: The Most Important Topic Affecting your Retirement: An Investor's Guide*. New York City, United States: DWM Capital Press.
- Mauldin, J., Tepper, J. (2011). *Endgame: The End of the Debt Super Cycle and how it Changes Everything*. Hoboken, United States: John Wiley & Sons.

- Merki, E. (2015). Why The Dollar Should No Longer be the World Reserve Currency Solving Global Account Imbalances Through Structural Reform. *Georgetown Journal of International Law*, Summer, 46(4), 1245-1273. Retrieved From HeinOnline Law Journal Library.
- Middelkoop, W. (2015). *The Big Reset: War on Gold and the Financial Endgame*. Amsterdam, Netherlands: Amsterdam University Press.
- Miller, T. (2017). *China's Asian Dream: Empire Building Along the New Silk Road*. London, United Kingdom: Zed Books.
- Mitry, D., Matula, T. (2012). Debt-Based Currency and Borrowing from the Future: Is it Sustainable? *American Society of Business and Behavioral Sciences*, 19(1), 615-626. Retrieved from Proquest Database.
- Morgan, J. (2009). How Should We Conceive the Continued Resilience of the U.S. Dollar as a Reserve Currency? *Review of Radical Political Economics*, 41(1), 43-61. DOI: 10.1177/0486613408324408.
- Narayanan, A., Bonneau, J., Felten, J., Miller, A., Goldfeder, S. (2016). *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction*. Princeton, United States: Princeton University Press.
- National Debt Clock. (2017). Countries. Retrieved From <http://www.nationaldebtclocks.org/#countries>.
- National Priorities. (2016). Federal Spending: Where Does the Money Go. Retrieved From <https://www.nationalpriorities.org/budget-basics/federal-budget-101/spending/>.
- New Development Bank. (2017). International organization jointly founded by the BRICS Countries. Retrieved From <http://www.ndb.int/about-us/organisation/members/>.
- NPR. (2011). A National Debt Of \$14 Trillion? Try \$211 Trillion. Retrieved From <http://www.npr.org/2011/08/06/139027615/a-national-debt-of-14-trillion-try-211-trillion>.
- NZForex. (2017). Historical Exchange Rates. Retrieved From <http://www.nzforex.co.nz/forex-tools/historical-rate-tools/historical-exchange-rates>.
- Ottawa Bullion. (2017). Watch Russia's "Gold-to-GDP" Ratio. Retrieved From <http://www.ottawabullion.com/rickards-watch-russias-gold-to-gdp-ratio/>.
- Papaioannou, E., Portes, R., Siourounis, G. (2006). Optimal currency shares in international reserves: The impact of the euro and the prospects for the dollar. *Journal of The Japanese and International Economies*, 20(4), 508-547. Retrieved From DOI: 10.1016/j.jjie.2006.07.002.
- Pew Research. (2016). The biggest U.S. tax breaks. Retrieved From <http://www.pewresearch.org/fact-tank/2016/04/06/the-biggest-u-s-tax-breaks/>.
- Pop, A. (2016). Scenarios For the Future of the International Monetary System. *Knowledge Horizons Economics*, 8(1), 80-83. Retrieved from Proquest.

- Prasad, E. (2010). The Financial Crisis and the Future of the US Dollar as the Global Reserve Currency. ECSSR, 84(1), 1-42. Retrieved from Proquest Database.
- Prasad, E., Ye, L. (2013). The Renminbi's Prospects as a Global Reserve Currency. Cato Journal, Fall, 33(3), 563-570. Retrieved from Proquest.
- Prasad, E, S. (2016). Gaining Currency: The Rise of The Renminbi. New York City, United States: Oxford University Press.
- PWC. (2015). State-Owned Enterprises Catalysts for public value creation? Retrieved From <https://www.pwc.com/gx/en/psrc/publications/assets/pwc-state-owned-enterprise-psrc.pdf>.
- Reinhart, C., Rogoff, K. (2011). This Time Is Different: Eight Centuries of Financial Folly. Princeton, United States: Princeton University Press.
- Reuters. (2010). BOJ reverts to zero rates, pledges to buy more assets. Retrieved From <http://www.reuters.com/article/us-japan-economy-idUSTRE69362P20101005>.
- Reuters. (2011). Putin says U.S. is "parasite" on global economy. Retrieved From <http://www.reuters.com/article/us-russia-putin-usa-idUSTRE77052R20110801>.
- Reuters. (2012). Bernanke says gold standard wouldn't solve problems. Retrieved From <http://www.reuters.com/article/us-usa-fed-gold-idUSBRE82J17A20120320>.
- Reuters. (2012). Japan, China to shore up yen/yuan trade; baby step for yuan. Retrieved From <http://in.reuters.com/article/japan-china-yuan-yen/japan-china-to-shore-up-yen-yuan-trade-baby-step-for-yuan-idINDEE84S00W20120529>.
- Reuters. (2013). BOJ to pump \$1.4 trillion into economy in unprecedented stimulus. Retrieved From <http://www.reuters.com/article/us-japan-economy-boj-idUSBRE93216U20130404>.
- Reuters. (2015). Swiss central bank stuns market with policy U-turn. Retrieved From <http://www.reuters.com/article/us-swiss-snb-cap-idUSKBN0KO0XK20150115>.
- Reuters. (2017). Kuroda says BOJ has ample options to exit QE policy. Retrieved From <http://www.reuters.com/article/us-japan-economy-kuroda-idUSKBN17D0AV>.
- Reuters. (2017). Xi says China will continue to open its economy, deepen financial reforms. Retrieved From <https://www.reuters.com/article/us-china-congress-economy-reforms/xi-says-china-will-continue-to-open-its-economy-deepen-financial-reforms-idUSKBN1CN09K>.
- Reuters. (2017). Highlights: French Prime Minister Philippe's key comments to lawmakers. Retrieved From <http://www.reuters.com/article/us-france-politics-pm-highlights-idUSKBN19P1UH>.
- Reuters. (2017). Russia's Sberbank begins physical gold trading on Shanghai exchange. Retrieved From <https://www.reuters.com/article/sberbank-gold-china/russias-sberbank-begins-physical-gold-trading-on-shanghai-exchange-idUSL8N1K41VS>.

- Reuters. (2017). China sets up gold fund as part of Silk Road initiative – media. Retrieved From <http://in.reuters.com/article/china-gold/china-sets-up-gold-fund-as-part-of-silk-road-initiative-media-idINKBN00A0G620150525>.
- Reuters. (2017). Pakistan to open up mineral-rich Baluchistan to China 'Silk Road' firms. Retrieved From <http://www.reuters.com/article/us-china-silkroad-pakistan-idUSKBN18T1TE>.
- Reuters. (2017). Puerto Rico files for biggest ever U.S. local government bankruptcy. Retrieved From <https://www.reuters.com/article/us-puertorico-debt-bankruptcy/puerto-rico-files-for-biggest-ever-u-s-local-government-bankruptcy-idUSKBN17Z1UC>.
- Reuters. (2017). Illinois state worker union members approve strike if needed. Retrieved From <http://www.reuters.com/article/us-illinois-union/illinois-state-worker-union-members-approve-strike-if-needed-idUSKBN16223E>.
- Reuters. (2017). Thousands of Greek pensioners protest against cuts as more austerity looms. Retrieved From <http://www.reuters.com/article/us-eurozone-greece-protests-pensioners/thousands-of-greek-pensioners-protest-against-cuts-as-more-austerity-looms-idUSKBN176186>.
- Rickards, J. (2011). *Currency Wars: The Making of the Next Global Crisis*. New York City, United States: Penguin Group.
- Rickards, J. (2014). *The Death of Money: The Coming Collapse of the International Monetary System*, New York City, United States: Portfolio Penguin.
- Rickards, J. (2015). *The Big Drop: How To Grow Your Wealth During the Coming Collapse*. Baltimore, United States: Laissez Faire Books.
- Rickards, J. (2016). *The Road to Ruin: The Global Elites' Secret Plan for the Next Financial Crisis*, New York City, United States: Penguin Random House.
- Rickards, J. (2016). *The New Case for Gold*. New York City, United States: Portfolio.
- Ross, A. (2016). *The Industries of the Future*. New York City, United States: Simon & Schuster.
- Roubini, N., Mian, S. (2010). *Crisis Economics: A Crash Course in the Future of Finance*. New York City, United States: The Penguin Press.
- RT. (2014). Nobel Prize winning economist praises \$100 bn BRICS bank created to counter Western dominance. Retrieved From <https://www.rt.com/usa/173912-stiglitz-brics-bank-interview/>.
- S&P Global. Research Update: United States of America Long-Term Rating Lowered To 'AA+' On Political Risks And Rising Debt Burden; Outlook Negative. Retrieved From http://www.standardandpoors.com/en_AP/web/guest/article/-/view/sourceId/6802837.
- Sharma, S. (2011). US Debt, Deficit, and the Falling Greenback: Does It Mean Currency Wars and an End to the Dollar's Reign? *SERI Quarterly*, 4(3), 67-78. Retrieved from Proquest.

- Shilling, G. (2011). *The Age of Deleveraging: Investment Strategies for a Decade of Slow Growth and Deflation*. Hoboken, United States: John Wiley & Sons.
- Skarica, D. (2014). *The Great Super Cycle: Profit from the Coming Inflation Tidal Wave and Dollar Devaluation*. New York City, United States: Wiley.
- Social Security. (2017). Research, Statistics, & Policy Analysis. Retrieved From https://www.ssa.gov/policy/docs/quickfacts/stat_snapshot/.
- South China Morning Post. (2017). China aims for pricing power in launching crude oil futures. Retrieved From <http://www.scmp.com/business/commodities/article/2102546/china-aims-pricing-power-launching-crude-oil-futures>.
- South China Morning Post. (2017). Shanghai Gold Exchange to offer yuan-back futures contract in Budapest. Retrieved From <http://www.scmp.com/business/china-business/article/2099370/shanghai-gold-exchange-offer-yuan-back-futures-contract>.
- Spiegel, F. (2005). Will the role of the dollar as the international reserve currency be challenged? *International Economics and Economic Policy*, 1(4), pp.293-304. DOI: 10.1007/s10368-004-0023-8.
- Sputnik. (2016). Rubles and yuans China Opens Moscow Clearing Bank for Handling Transactions in Yuan. Retrieved From <https://sputniknews.com/russia/201703271052005629-china-bank-clearing-transactions/>.
- Standard & Poor. (2017). S&P Global Ratings Definitions. Retrieved From https://www.standardandpoors.com/en_US/web/guest/article/-/view/sourceId/504352.
- Steil, B. (2014). *The Battle of Bretton Woods: John Maynard Keynes, Harry Dexter White, and the Making of a New World Order*. Princeton, The United States: Princeton University Press.
- Taleb, N, N. (2010). *The Black Swan: The Impact of the Highly Improbable (2nd)*. New York City, United States: Random House Trade.
- TASS. (2014). Eurasian Economic Union to have common currency in 5-10 years. Retrieved From <http://tass.com/economy/742323>.
- Time. (2000). Foreign Exchange: Saddam Turns His Back on Greenbacks. Retrieved From <http://content.time.com/time/magazine/article/0,9171,998512,00.html>.
- Time. (2017). CRFB President: Trump's Tax Plan Will Add \$5.5 Trillion to the Debt. Retrieved From <http://time.com/4758411/donald-trump-tax-plan-debt-cost/>.
- The Atlantic. (2013). 32 Republicans Who Caused the Government Shutdown. Retrieved From <https://www.theatlantic.com/politics/archive/2013/10/32-republicans-who-caused-the-government-shutdown/280236/>.
- The Atlantic. (2015). Why Are Republicans So Obsessed With the Gold Standard? Retrieved From <https://www.theatlantic.com/business/archive/2015/11/gop-debate-gold-standard/415386/>.

- The Atlantic. (2016). The Political Price of Merkel's Migrant Policy. Retrieved From <https://www.theatlantic.com/international/archive/2016/09/merkel-isis-refugee-germany-afd/499550/>
- The Balance. (2016). What Is QE1? Definition, Overview, Did It Work. Retrieved From <https://www.thebalance.com/what-is-qe1-3305530>.
- The Balance. (2016). QE2 (Quantitative Easing 2): Did It Work? Retrieved From <https://www.thebalance.com/qe2-quantitative-easing-2-3305531>.
- The Balance. (2016). What Is QE3? Pros and Cons. Retrieved From <https://www.thebalance.com/what-is-qe3-pros-and-cons-3305533>.
- The Balance. (2017). The Fed's Operation Twist. Retrieved From <https://www.thebalance.com/what-is-operation-twist-416914>.
- The Diplomat. (2014). A Common Currency for the EEU? Retrieved From <http://thediplomat.com/2014/12/a-common-currency-for-the-eeu/>.
- The Diplomat. (2016). Japan Ups the Ante in War on Deflation. Retrieved From <http://thediplomat.com/2016/09/japan-ups-the-ante-in-war-on-deflation/>.
- The Diplomatic. (2016). Behind China and Russia's 'Special Relationship'. Retrieved From <https://thediplomat.com/2016/12/behind-china-and-russias-special-relationship/>.
- The Economist. (2015). Why the Swiss unpegged the franc. Retrieved From <https://www.economist.com/blogs/economist-explains/2015/01/economist-explains-13>.
- The Economist. (2012). The Fed acts, just. Retrieved From <https://www.economist.com/blogs/freeexchange/2012/06/operation-twist>.
- The Guardian. (2009). Bank of England cuts rates to 0.5% and starts quantitative easing. Retrieved From <https://www.theguardian.com/business/2009/mar/05/interest-rates-quantitative-easing>.
- The Guardian. (2015). Swiss bank's currency U-turn hurts watchmakers, skiers and traders. Retrieved From <https://www.theguardian.com/business/2015/jan/15/currency-markets-switzerland-franc>.
- The Guardian. (2015). US anger at Britain joining Chinese-led investment bank AIIB. Retrieved From <https://www.theguardian.com/us-news/2015/mar/13/white-house-pointedly-asks-uk-to-use-its-voice-as-part-of-chinese-led-bank>.
- The Independent. (2015). Putin suggests single currency for Eurasian Economic Union. Retrieved From <http://www.independent.co.uk/news/world/asia/putin-suggests-single-currency-for-eurasian-economic-union-10123676.html>.
- The Japanese Times. (2016). Japan's fiscal 2017 budget requests look to top ¥101 trillion . Retrieved From http://www.japantimes.co.jp/news/2016/08/26/national/japans-fiscal-2017-budget-requests-look-top-%C2%A5101-trillion/#.WP_EO4iGOUk.
- The New York Times. (2011). Stop Coddling the Super-Rich. Retrieved From <http://www.nytimes.com/2011/08/15/opinion/stop-coddling-the-super-rich.html>.

- The New York times. (2014). China and Russia Reach 30-Year Gas Deal. Retrieved From <https://www.nytimes.com/2014/05/22/world/asia/china-russia-gas-deal.html?mcubz=0>.
- The New York Times. (2014). China and Russia Reach 30-Year Gas Deal. Retrieved From <https://www.nytimes.com/2014/05/22/world/asia/china-russia-gas-deal.html>.
- The New York Times. (2016). Helicopter Money: Why Some Economists Are Talking About Dropping Money from the Sky. Retrieved From <https://www.nytimes.com/2016/07/29/upshot/helicopter-money-why-some-economists-are-talking-about-dropping-money-from-the-sky.html>.
- The New York Times. (2016). With Trump in Power, the Fed Gets Ready for a Reckoning. Retrieved From <https://www.nytimes.com/2016/11/13/business/economy/trump-the-fed-yellen-gets-ready-for-reckoning.html?mcubz=0>.
- The New York Times. (2017). International Monetary Fund Based in Beijing? Maybe, Its Director Says. Retrieved From <https://www.nytimes.com/2017/07/24/us/politics/christine-lagarde-international-monetary-fund.html?mcubz=0>.
- The New York Times. (2017). Why Troubles at a Midsize Italian Bank Worry the E.U. Retrieved From <https://www.nytimes.com/2017/06/01/business/dealbook/italy-bank-mps-debt.html?mcubz=0>.
- The New York Times. (2017). Puerto Rico Declares a Form of Bankruptcy. Retrieved From <https://www.nytimes.com/2017/05/03/business/dealbook/puerto-rico-debt.html?mcubz=0>.
- The New York Times. (2017). Trump Supports Plan to Cut Legal Immigration by Half. Retrieved From <https://www.nytimes.com/2017/08/02/us/politics/trump-immigration.html?mcubz=0>.
- The New York Times. (2017). Congress Returns to a Busy Schedule. What's on the Agenda? Retrieved From <https://www.nytimes.com/2017/09/05/us/politics/congress-fall-agenda-hurricane-aid-debt-ceiling.html?mcubz=0>.
- The Telegraph. (2009). Bank of England expected to expand money-printing programme to £225bn. Retrieved From <http://www.telegraph.co.uk/finance/recession/6503605/Bank-of-England-expected-to-expand-money-printing-programme-to-225bn.html>.
- The Telegraph. (2017). Next global financial crisis to hit with a 'vengeance', warns BIS. Retrieved From <http://www.telegraph.co.uk/business/2017/06/25/next-global-financial-crisis-hit-vengeance-warns-bis/>.
- The Telegraph. (2017). Deficit climbs as Government borrowing costs rise. Retrieved From <http://www.telegraph.co.uk/business/2017/07/21/deficit-climbs-government-borrowing-costs-rise/>.
- The Telegraph. (2017). Is UK heading towards another credit crisis? Bank warning over boom in car loans and card debt. Retrieved From <http://www.telegraph.co.uk/business/2017/06/27/bank-england-orders-banks-hold-extra-114bn-emergencies/>.

- The United States White House. (2017). America First: A Budget Blueprint to Make America Great Again. Retrieved From https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/budget/fy2018/2018_blue_print.pdf.
- The Wall Street Journal. (2016). Census Says U.S. Population Grew at Lowest Rate Since Great Depression This Year. Retrieved From <https://www.wsj.com/articles/census-says-u-s-population-grew-at-lowest-rate-since-great-depression-this-year-1482262203>.
- The Washington Post. (2016). Chicago teachers go on strike, shutting down nation's third-largest school system. Retrieved From https://www.washingtonpost.com/news/education/wp/2016/04/01/chicago-teachers-to-strike-friday-shutting-down-nations-third-largest-school-system/?utm_term=.6badb6ec6118.
- The Washington Post. (2016). It's official: Japan's population is dramatically shrinking. Retrieved From https://www.washingtonpost.com/news/worldviews/wp/2016/02/26/its-official-japans-population-is-drastically-shrinking/?utm_term=.6748e6a9071c.
- The Washington Post. (2017). Trump seeks to slash Education Department but make big push for school choice Retrieved From https://www.washingtonpost.com/local/education/trump-seeks-to-slash-education-department-but-make-big-push-for-school-choice/2017/03/15/63b8b6f8-09a1-11e7-b77c-0047d15a24e0_story.html?utm_term=.15cb58fe2068.
- The World Bank. (2016). Total reserves (includes gold, current US\$). Retrieved From <https://data.worldbank.org/indicator/FI.RES.TOTL.CD>.
- The World Bank. (2017). Inflation, consumer prices (annual %). Retrieved From <http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>.
- The World Bank. (2017). Projects and Operations. Retrieved From <http://projects.worldbank.org/>.
- Trading Economics. (2017). Credit Rating. Retrieved From <https://tradingeconomics.com/country-list/rating>.
- UN Data. (2017). Population median age (years). Retrieved From http://data.un.org/Data.aspx?q=united+states+of+america&d=WHO&f=MEASURE_CODE%3AWHS9_88%3BCOUNTRY_ISO_CODE%3AUSA.
- United Nations. (2017). 2017 Revision of World Population Prospects. Retrieved From <https://esa.un.org/unpd/wpp/>.
- United States Senate. (2017). Party Division. Retrieved From <https://www.senate.gov/history/partydiv.htm>.
- USDA. (2017). Supplemental Nutrition Assistance Program (SNAP). Retrieved From <https://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap>.

- US Government Det. (2017). Accumulated Gross Federal Debt. Retrieved From http://www.usgovernmentdebt.us/spending_chart_1900_2020USp_18s2li011tcn_H0f_Accumulated_Gross_Federal_Debt#copypaste.
- US Government Debt. (2017). Compare state and local debt for the 50 states against state growth and population. Retrieved From http://www.usgovernmentdebt.us/compare_state_spending_2010bH0C.
- US department of Treasury. (2011). Secretary Geithner Sends Debt Limit Letter to Congress. Retrieved From <https://www.treasury.gov/connect/blog/Pages/letter.aspx>.
- US department of Treasury. (2013). Secretary Lew Sends Debt Limit Letter To Congress. Retrieved From <https://www.treasury.gov/connect/blog/Pages/Secretary-Lew-Sends-Debt-Limit-Letter-To-Congress-9-25.aspx>.
- US Department of Treasury. (2017). Securities (B): Portfolio Holdings of U.S. and Foreign Securities. Retrieved From <https://www.treasury.gov/resource-center/data-chart-center/tic/Pages/ticsec2.aspx>.
- US Department of Treasury. (2017). Daily Treasury Yield Curve Rates. Retrieved From <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield>.
- United Nations. (2017). World Population Prospects: The 2017 Revision. Retrieved From <https://www.un.org/development/desa/publications/world-population-prospects-the-2017-revision.html>.
- US Treasury. (2017). Major Foreign Holders of Treasury Securities. Retrieved From <http://ticdata.treasury.gov/Publish/mfh.txt>.
- Wang, D., Huang, Y., & Fan, G. (2015). Will the Renminbi become a reserve currency? China Economic Journal, 8(1), 55-73. DOI: 10.1080/17538963.2015.1001053.
- Weatherford, J. (2009). The History of Money. Crown Business. Boston, United States: Crown Business.
- World Bank. (2017). GDP (constant US\$). Retrieved From <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>.
- World Gold Council. (2017). Gold Data. Retrieved From <https://www.gold.org/data>.
- World Economic Forum. (2017). Top quotes by China President Xi Jinping at Davos 2017. Retrieved From <https://www.weforum.org/agenda/2017/01/chinas-xi-jinping-at-davos-2017-top-quotes/>.
- Wray, R. (2015). Why Minsky Matters: An introduction to the Work of a Maverick Economist. Princeton, United States: Princeton University Press.
- Yeh, K. (2012). Renminbi in the future international monetary system. International Review of Economics & Finance, 21(1), 106-114. Retrieved from Science Direct Database.

Appendices

Table 1

Currency Distribution of Global Foreign Exchange Market Turnover (Percentages)

Currency Distribution of Global Foreign Exchange Market Turnover (Percentages)						
	2001	2004	2007	2010	2013	2016
USD	89.9	88	85.6	84.9	87	87.6
Euro	37.9	37.4	37	39.1	33.4	31.4
Japanese Yen	23.5	20.8	17.2	19	23	21.6
British Pound	13	16.5	14.9	12.9	11.8	12.8
Australian Dollar	4.3	6	6.6	7.6	8.6	6.9
Swiss Franc	6	6	6.8	6.3	5.2	4.8
Russian Ruble	0.3	0.6	0.7	0.9	1.6	1.1
Chinese Yuan	0	0.1	0.5	0.9	2.2	4
All Other Currencies	25.1	24.6	30.7	28.4	27.2	29.8
Total	200	200	200	200	200	200

Table 2

International Bonds and Notes Outstanding (Selected Currencies)

International Bonds and Notes Outstanding (Selected Currencies)		
	Total In Billions	Share as Percentage Total
USD	8,816	42.7%
Euro	8,092	39.2%
British Pound	1,988	9.6%
Yen	402	1.9%
Swiss Franc	295	1.4%
Chinese Yuan	98	0.5%
All Other Currencies	971	4.7%

Countries GDP as a Percentage of World GDP (2016)

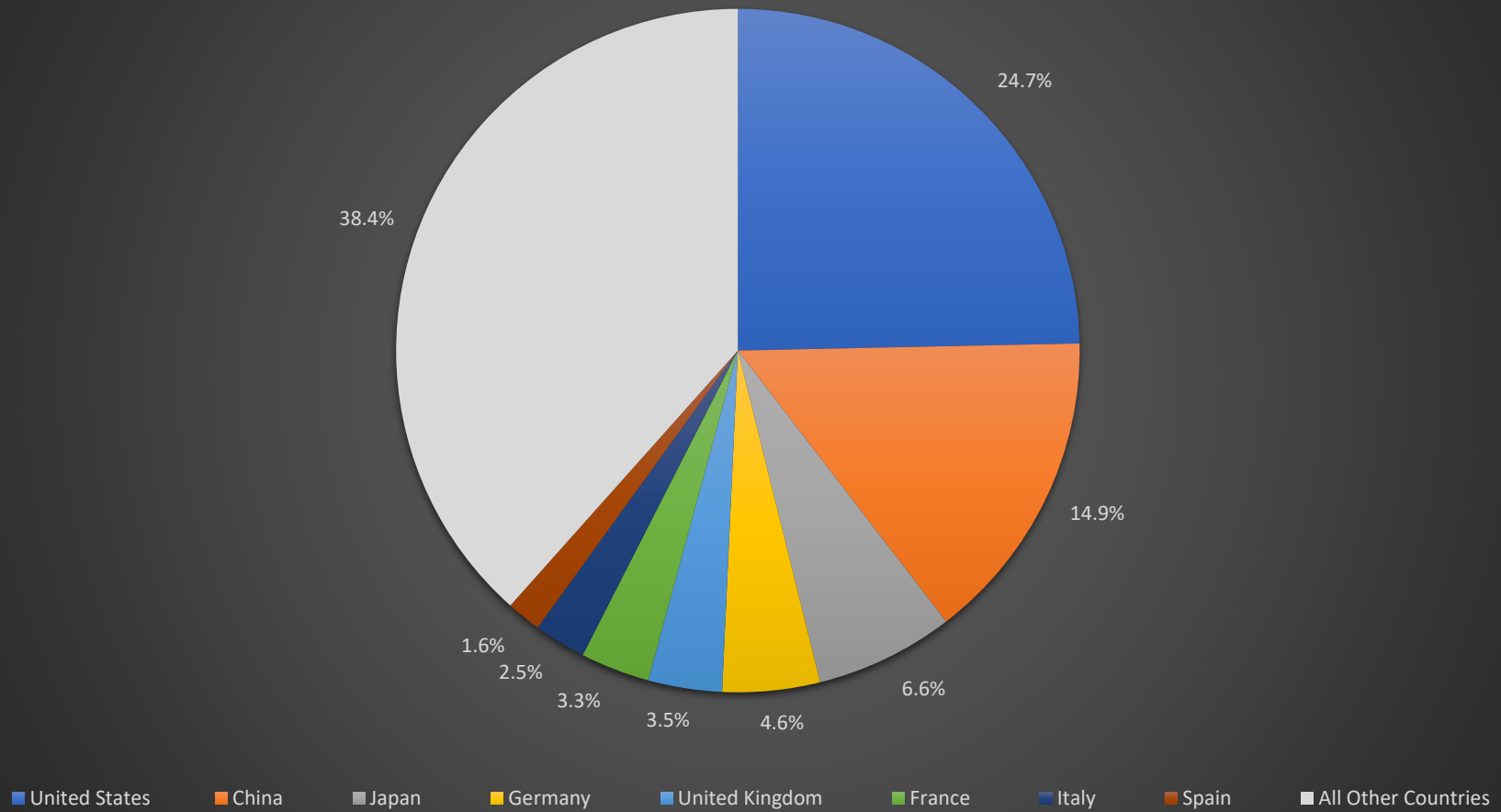


Figure 1. Countries GDP as a Percentage of World GDP (2016)

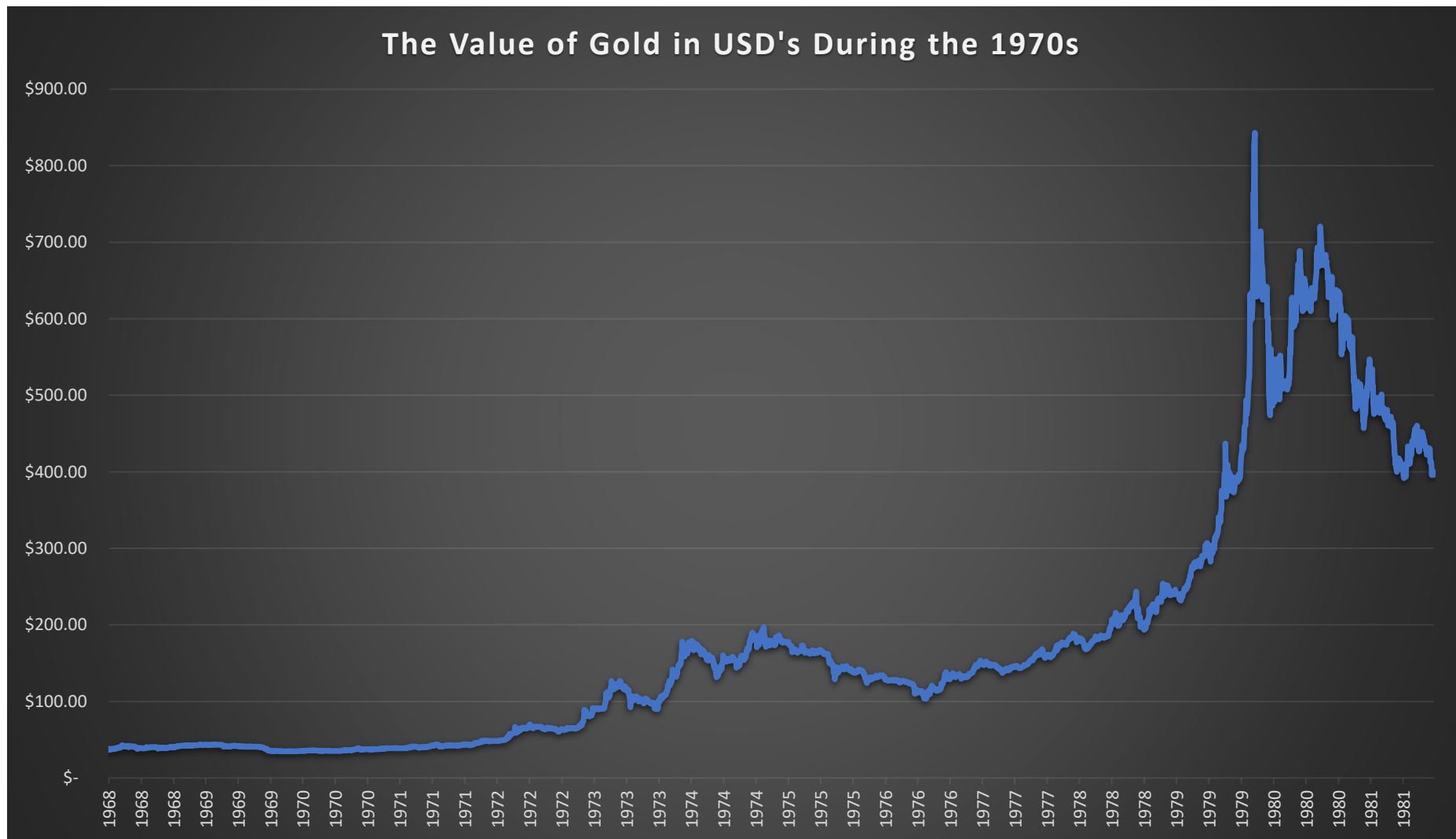


Figure 2. The Value of Gold in USD's During the 1970s

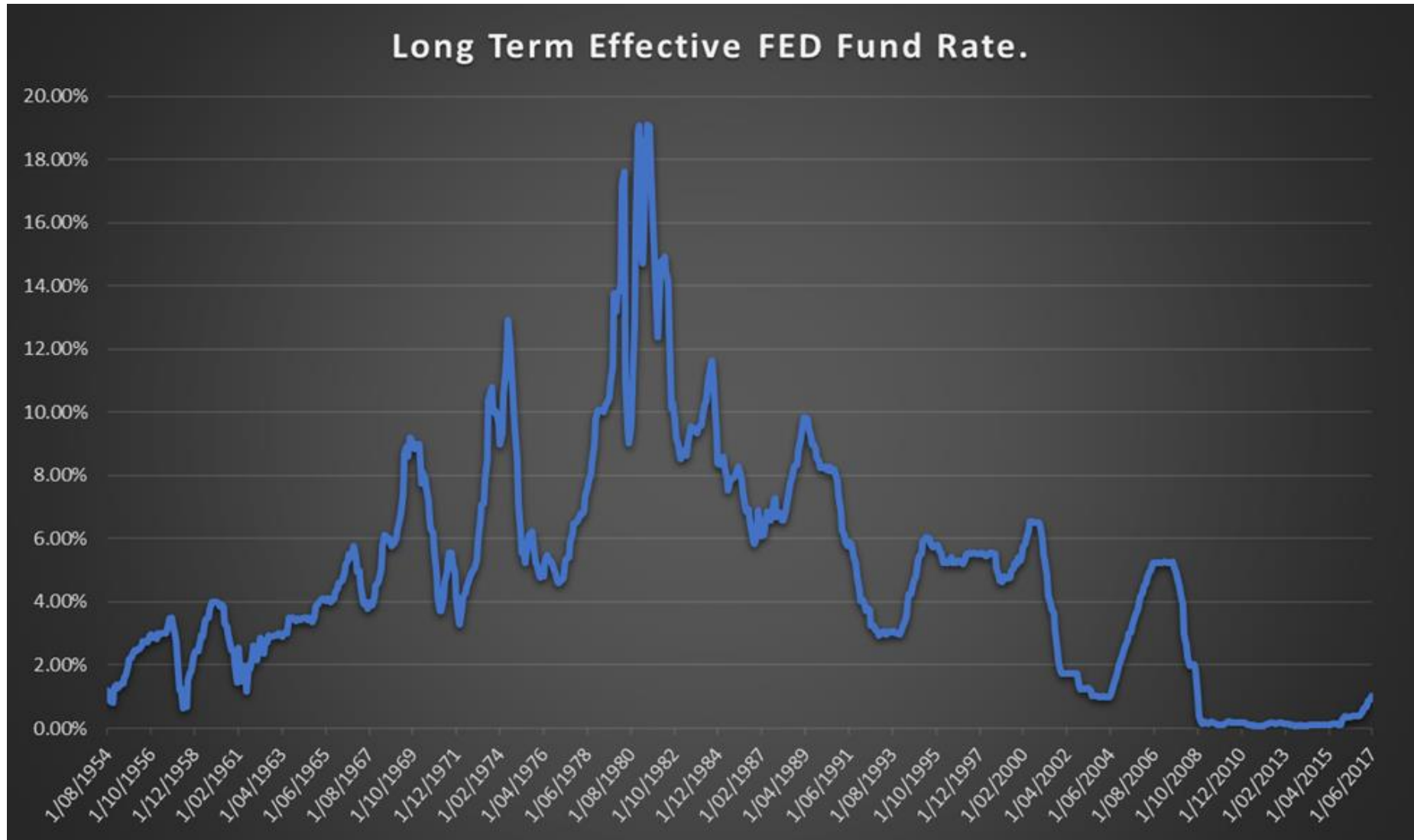


Figure 3. Long Term Effective Fed Fund Rate

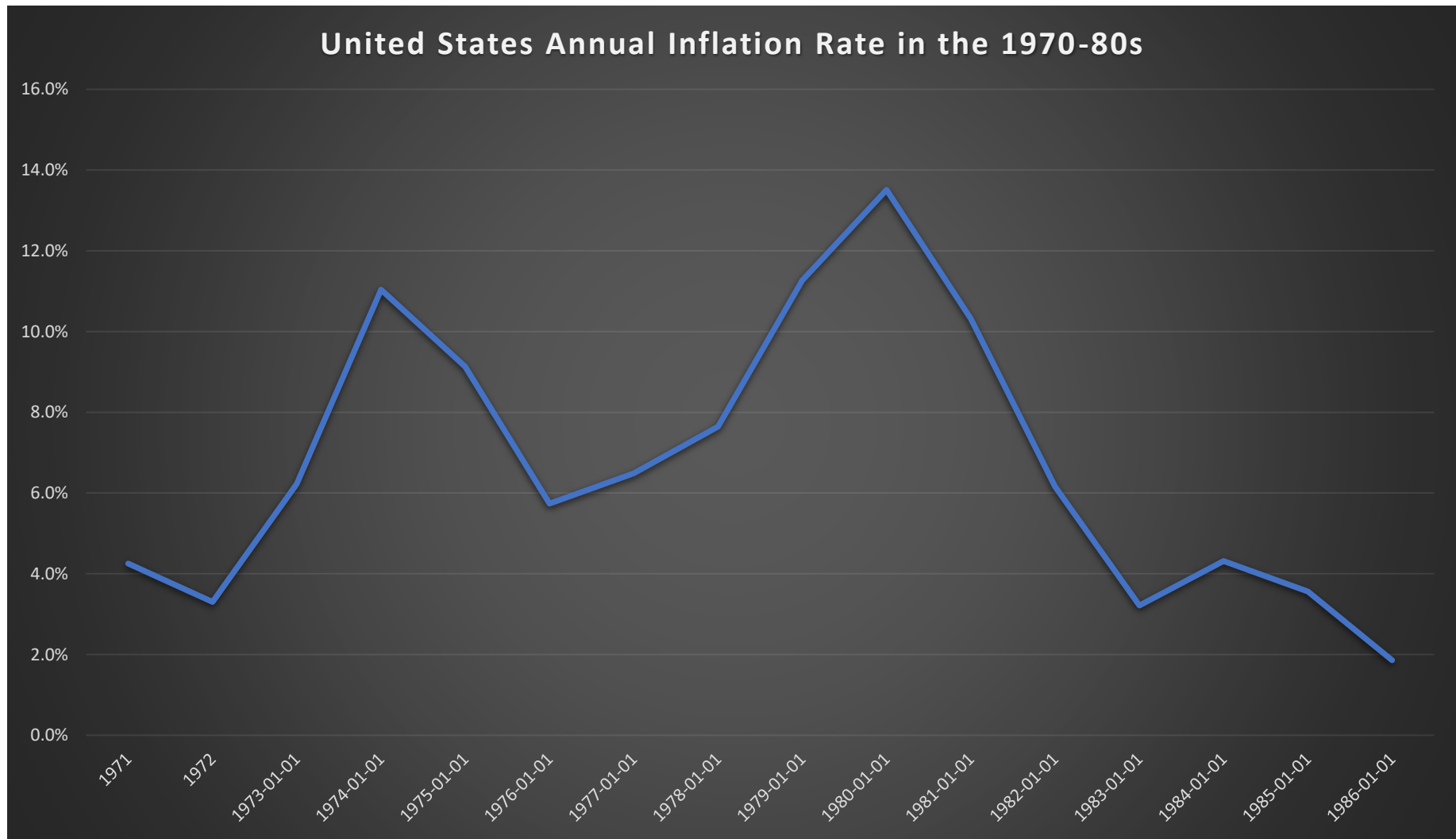


Figure 4. United States Annual Inflation Rate in the 1970-80s

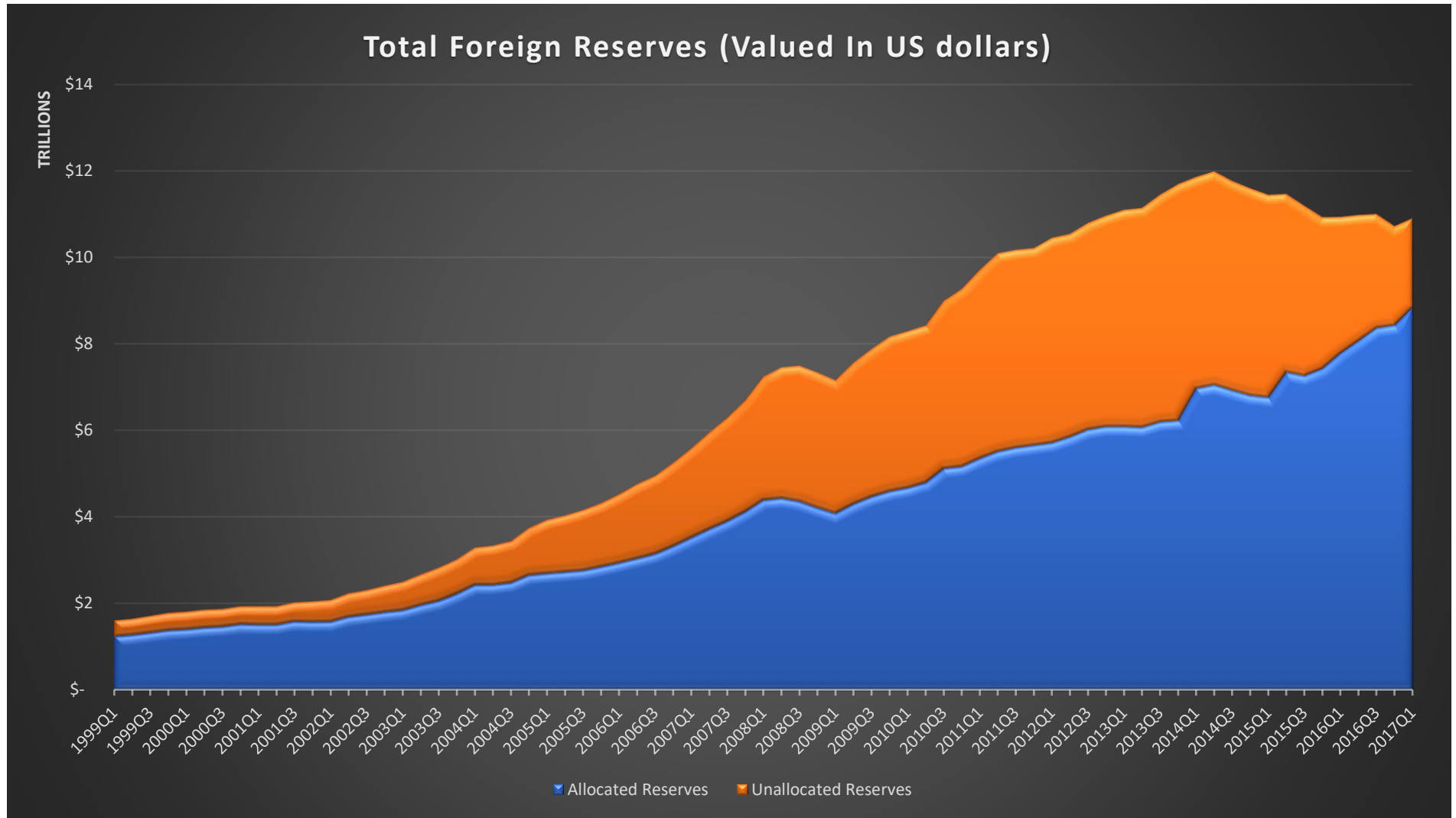


Figure 5. Total Foreign Reserves (Valued In US dollars)

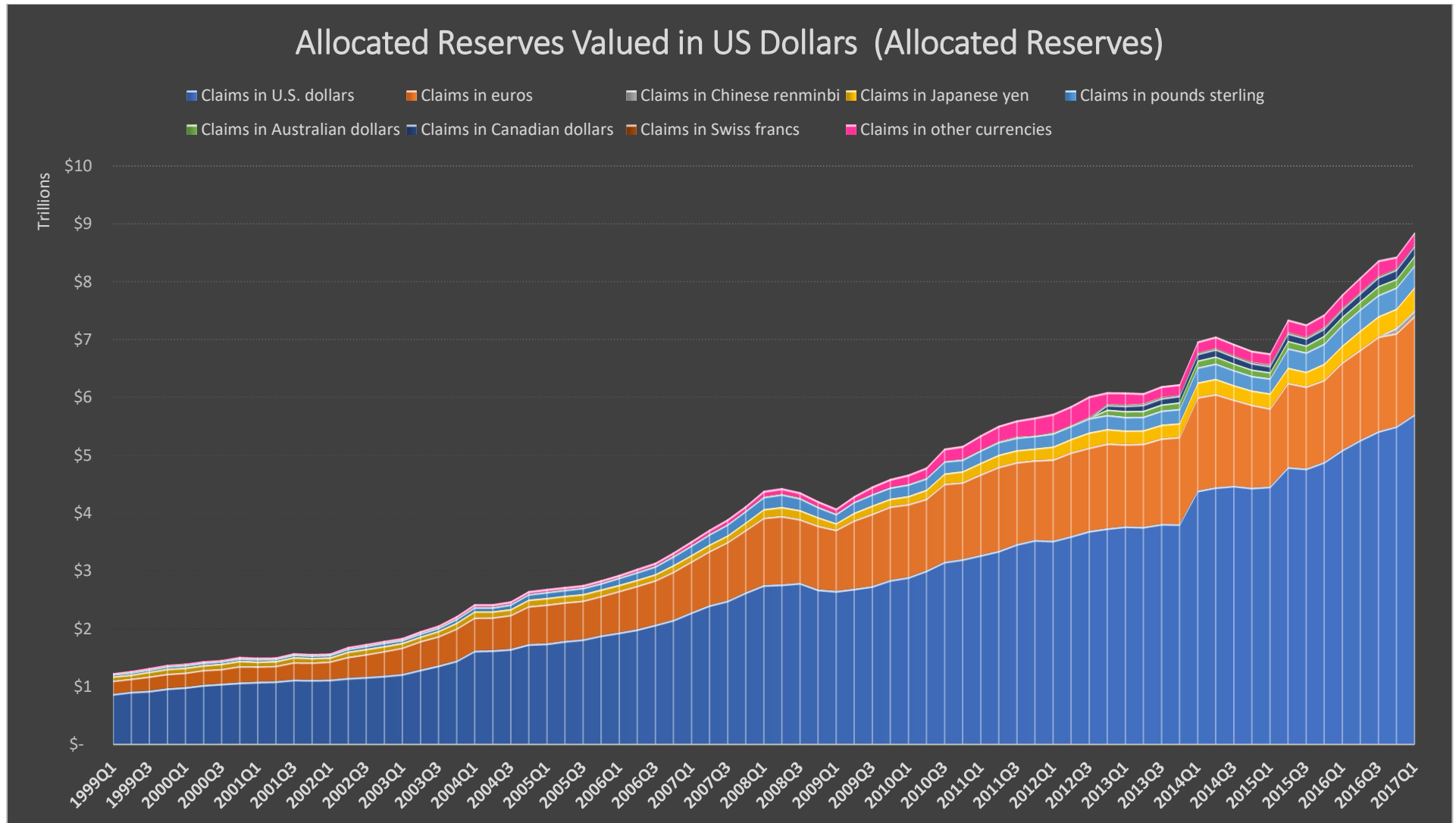


Figure 6. Allocated Reserves Valued in US Dollars (Allocated Reserves)

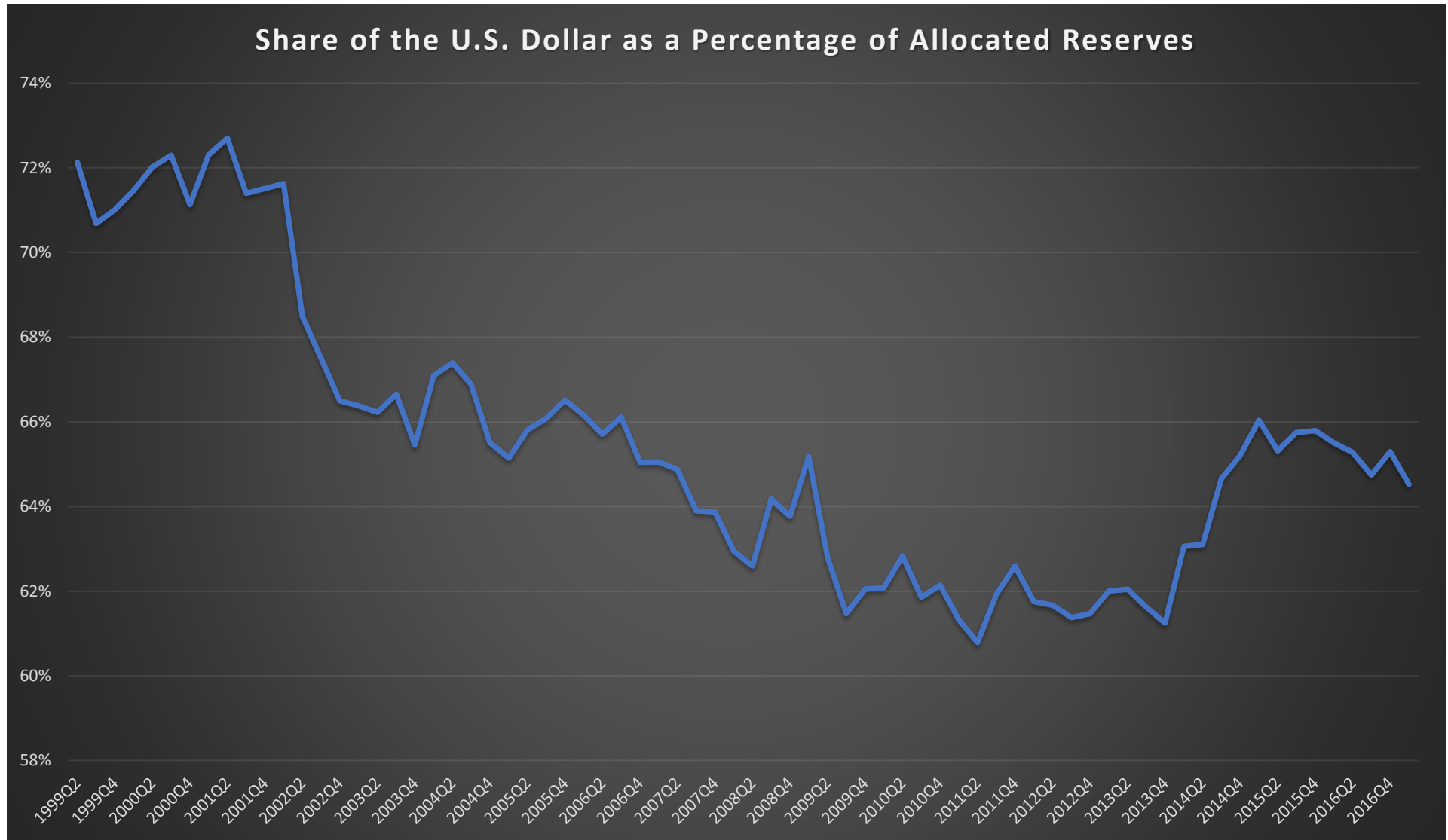


Figure 7. Share of the U.S. Dollar as a Percentage of Allocated Reserves

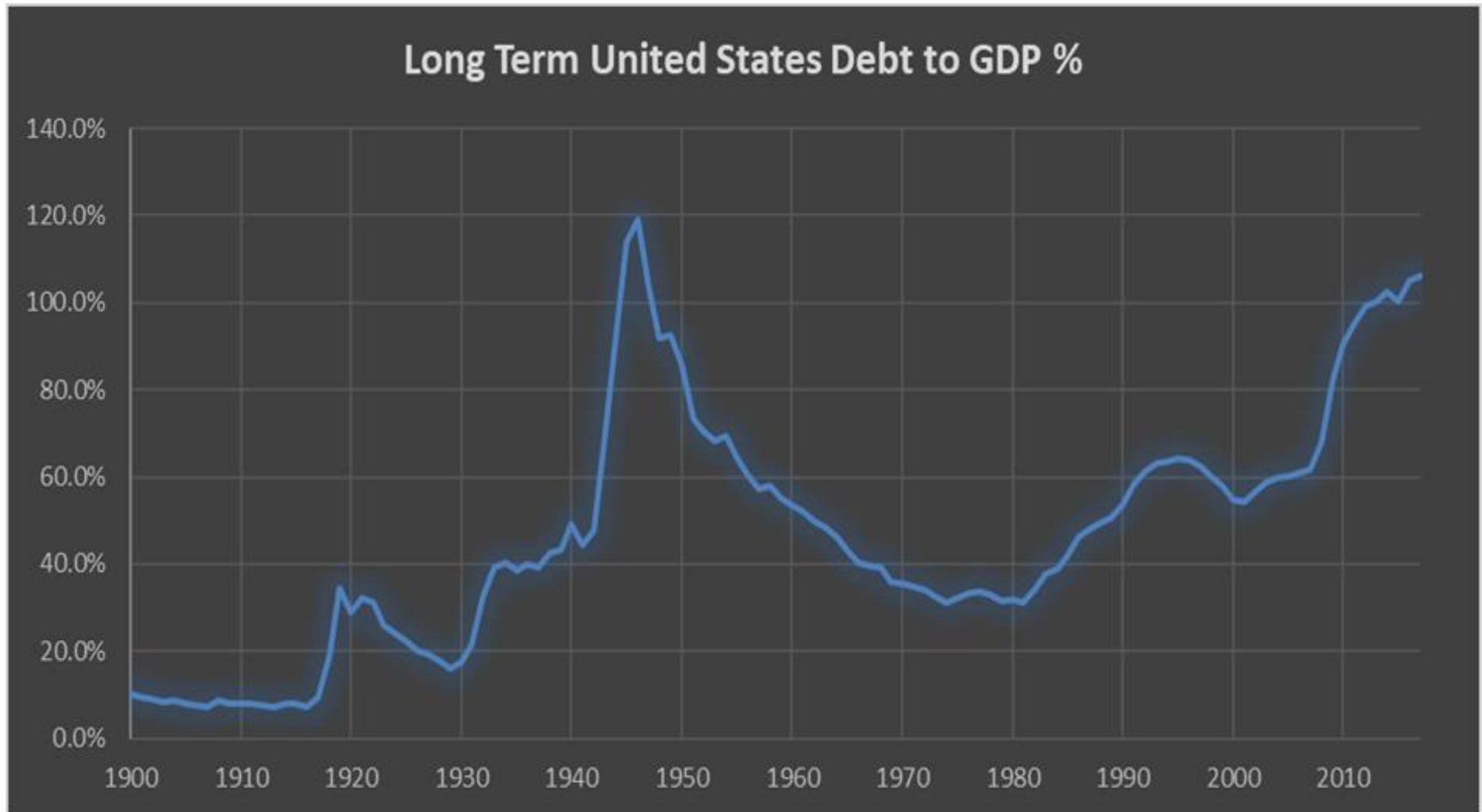


Figure 8. Long Term United States Debt to GDP %

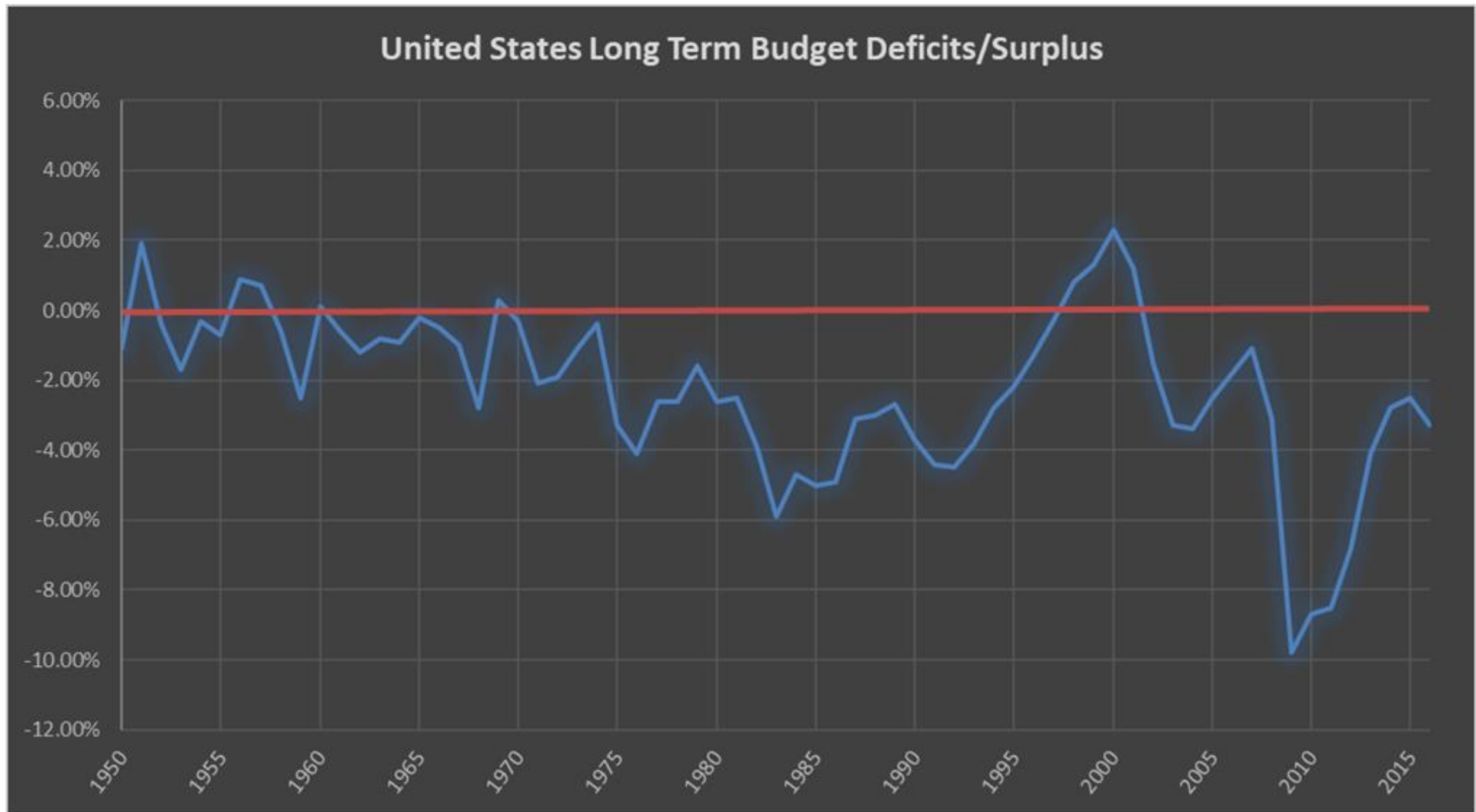


Figure 9. United States Long Term Budget Deficits/Surplus

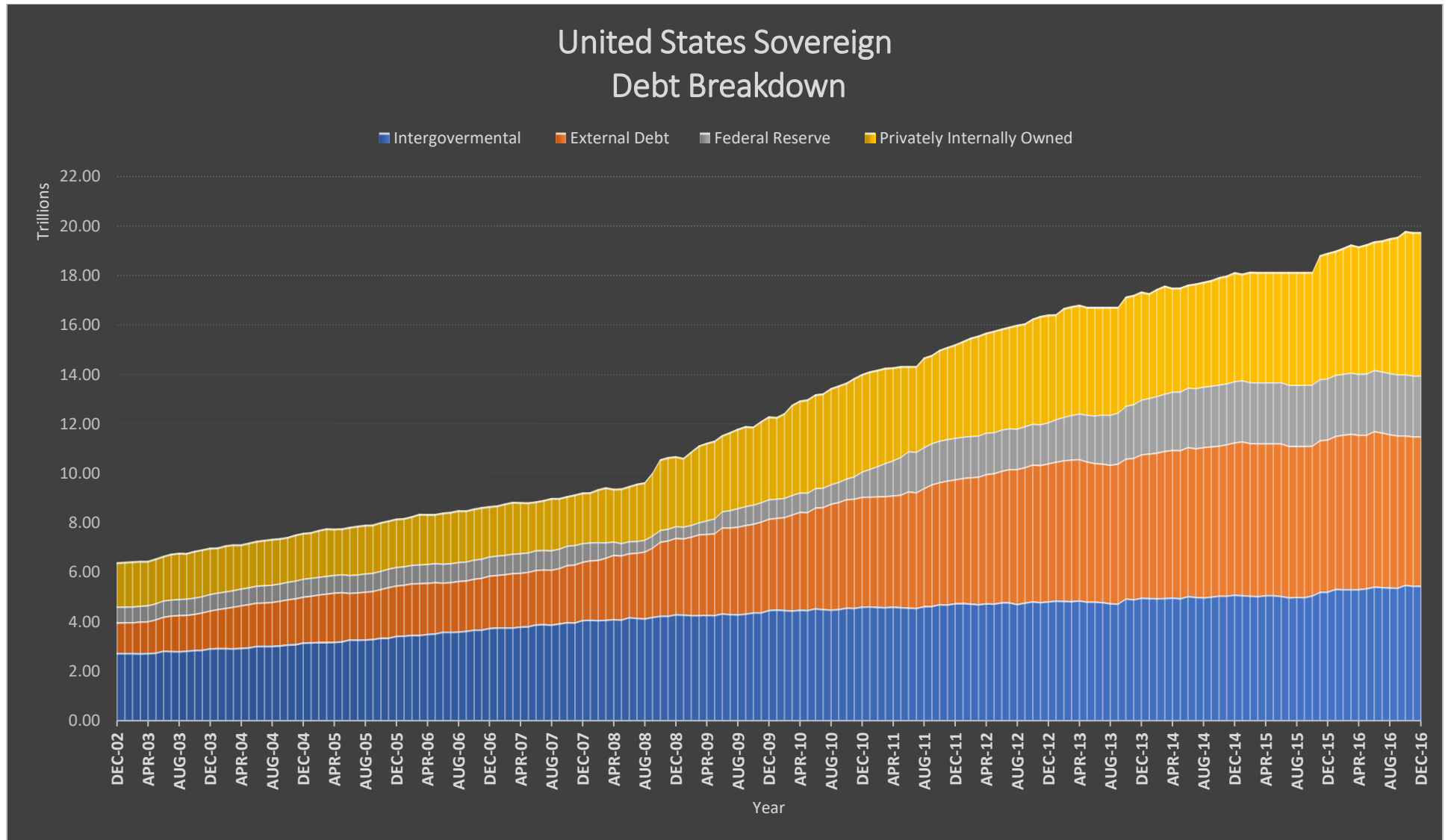


Figure 10. United States Sovereign Debt Breakdown

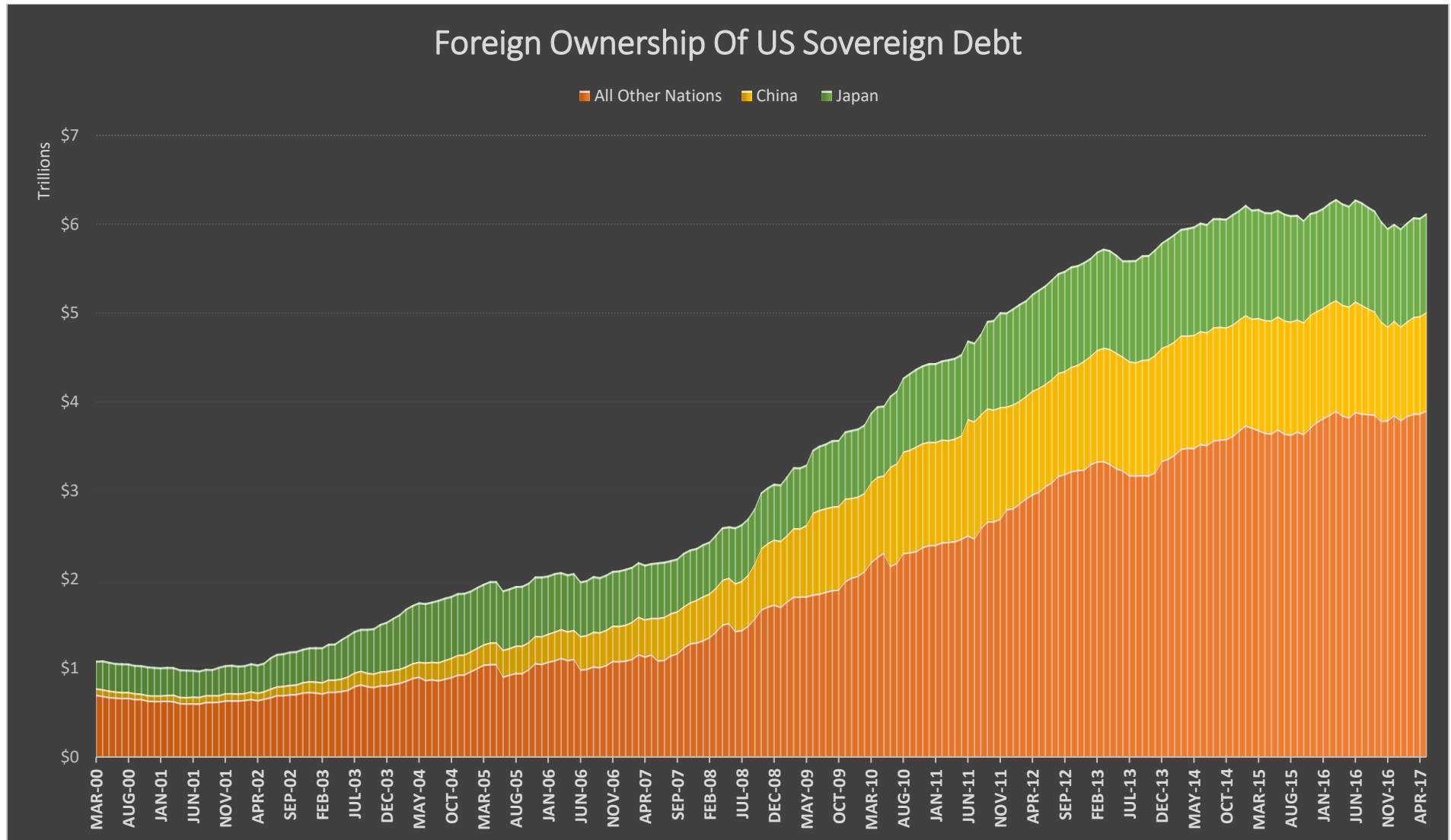


Figure 11. Foreign Ownership of US Sovereign Debt

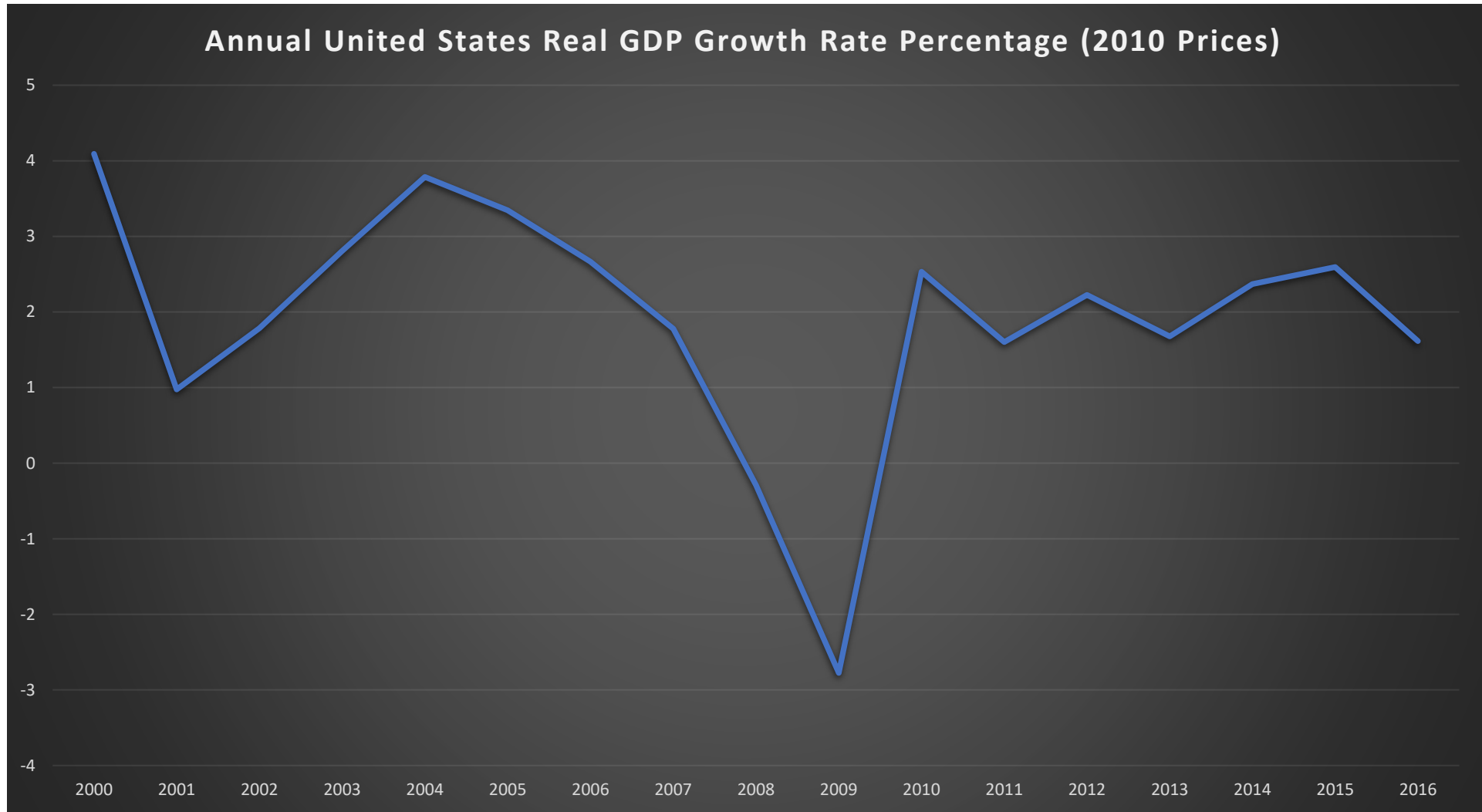


Figure 12. Annual United States Real GDP Growth Rate Percentage (2010 Prices)

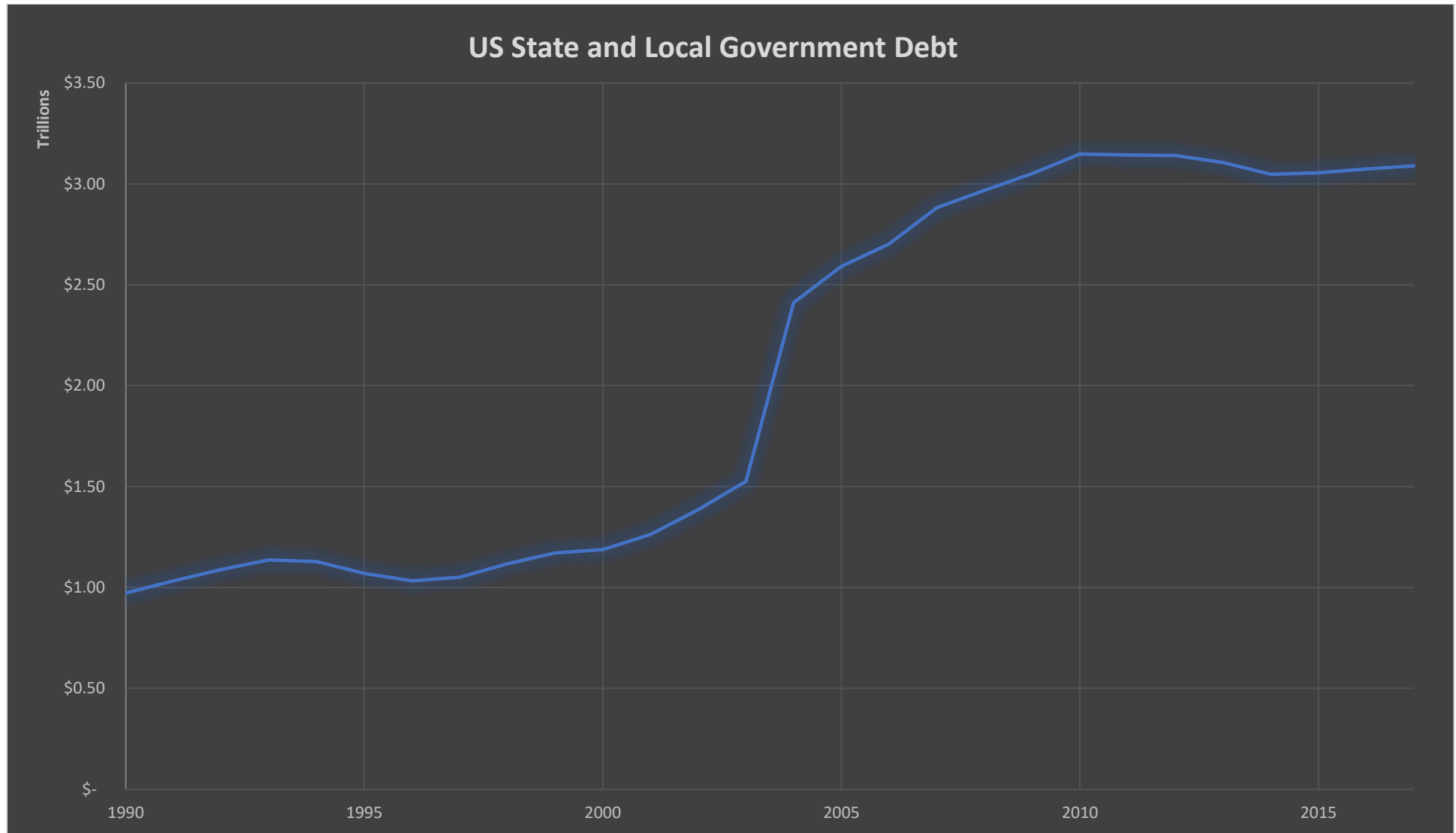


Figure 13. US State and Local Government Debt

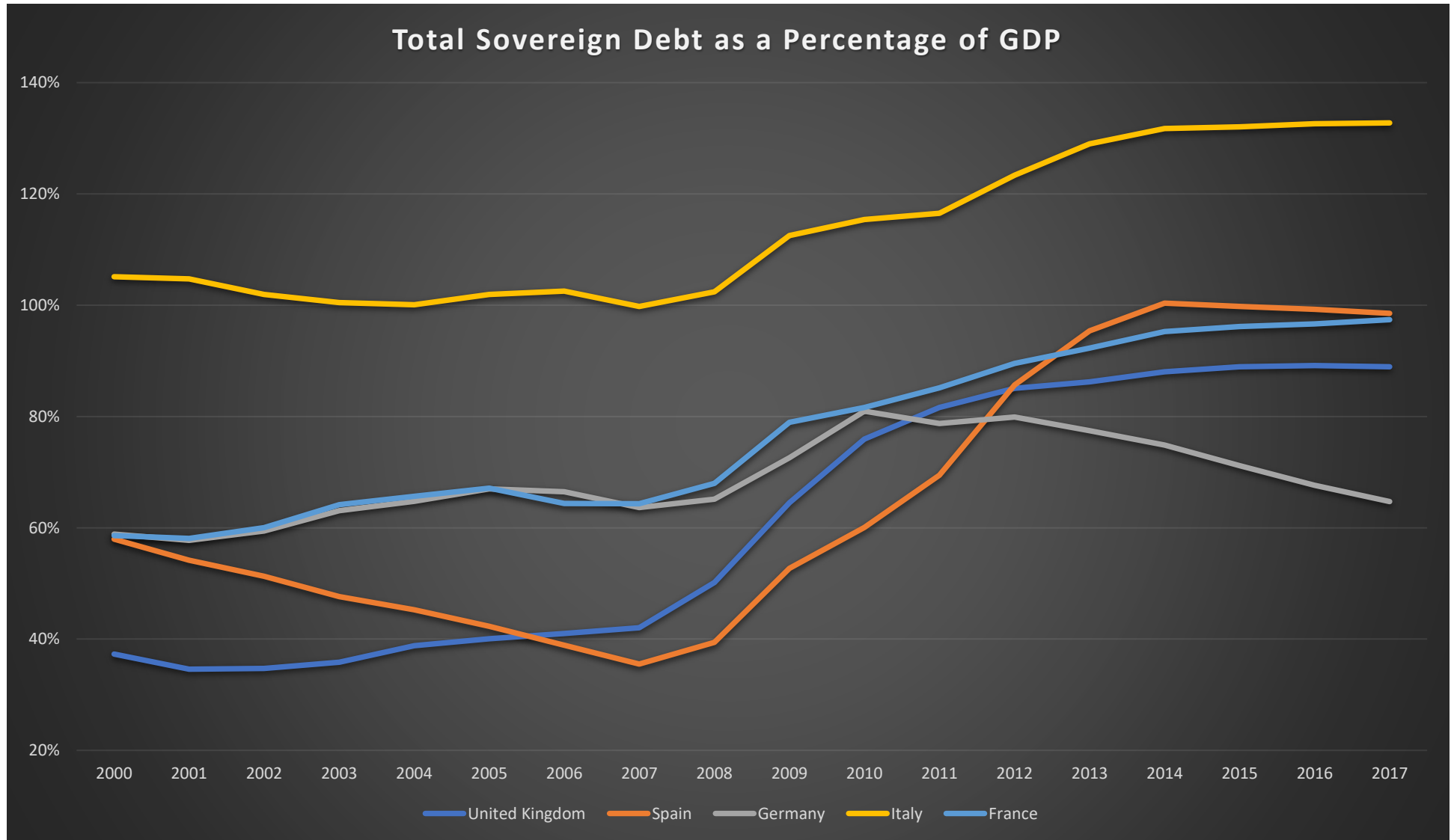


Figure 14. Total Sovereign Debt as a Percentage of GDP

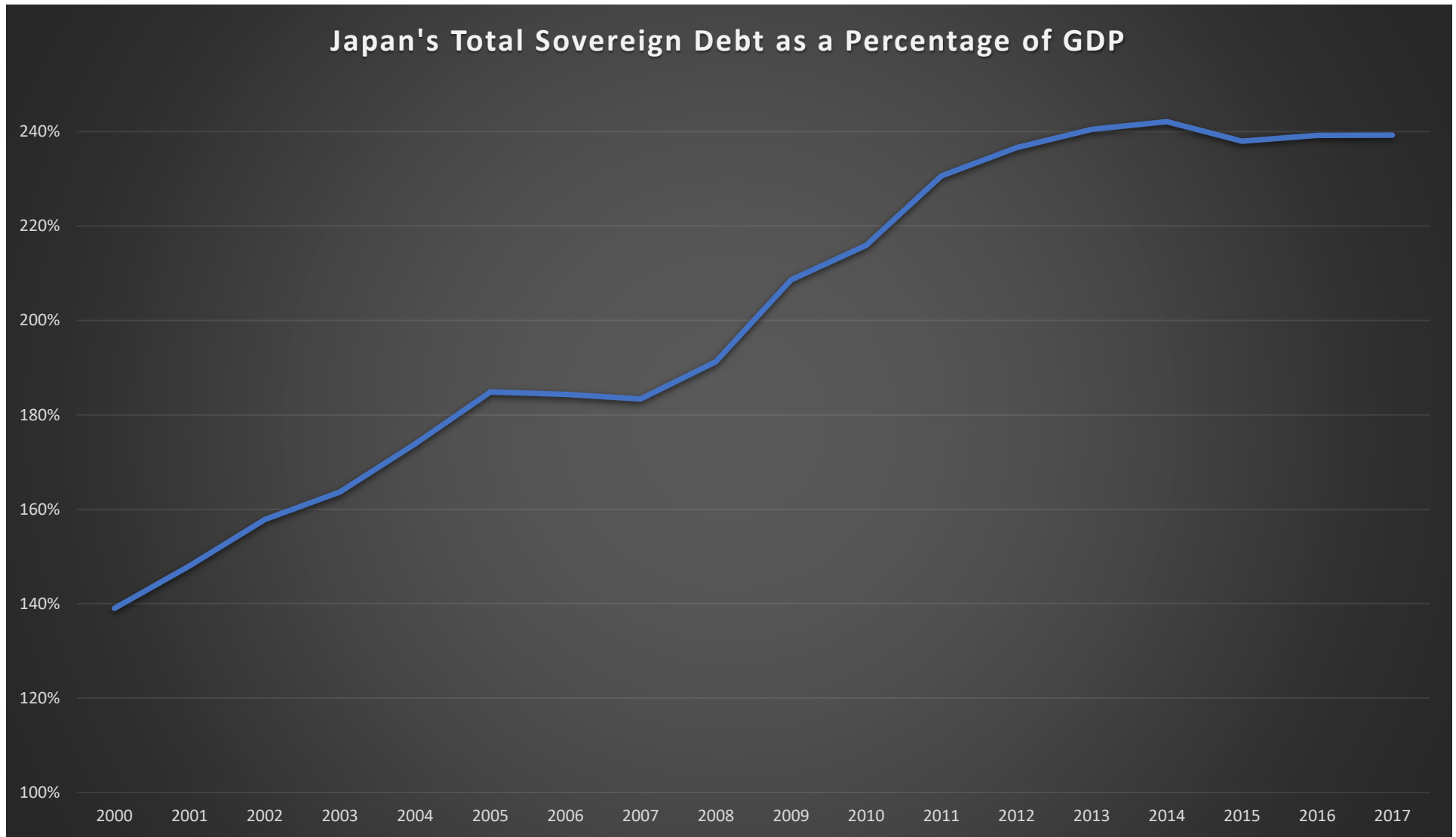


Figure 15. Japan's Total Sovereign Debt as a Percentage of GDP

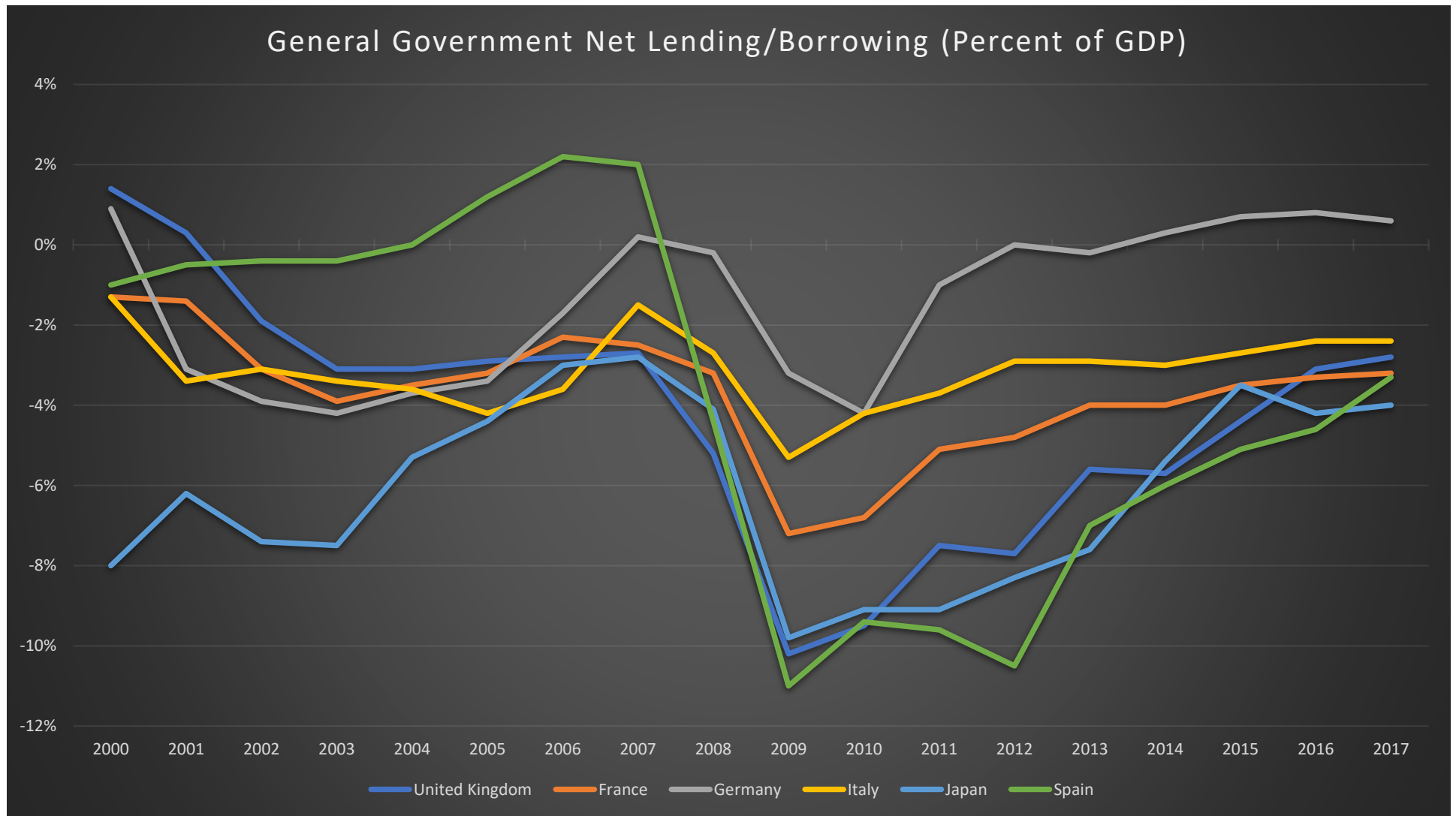


Figure 16. General Government Net Lending/Borrowing (Percent of GDP)

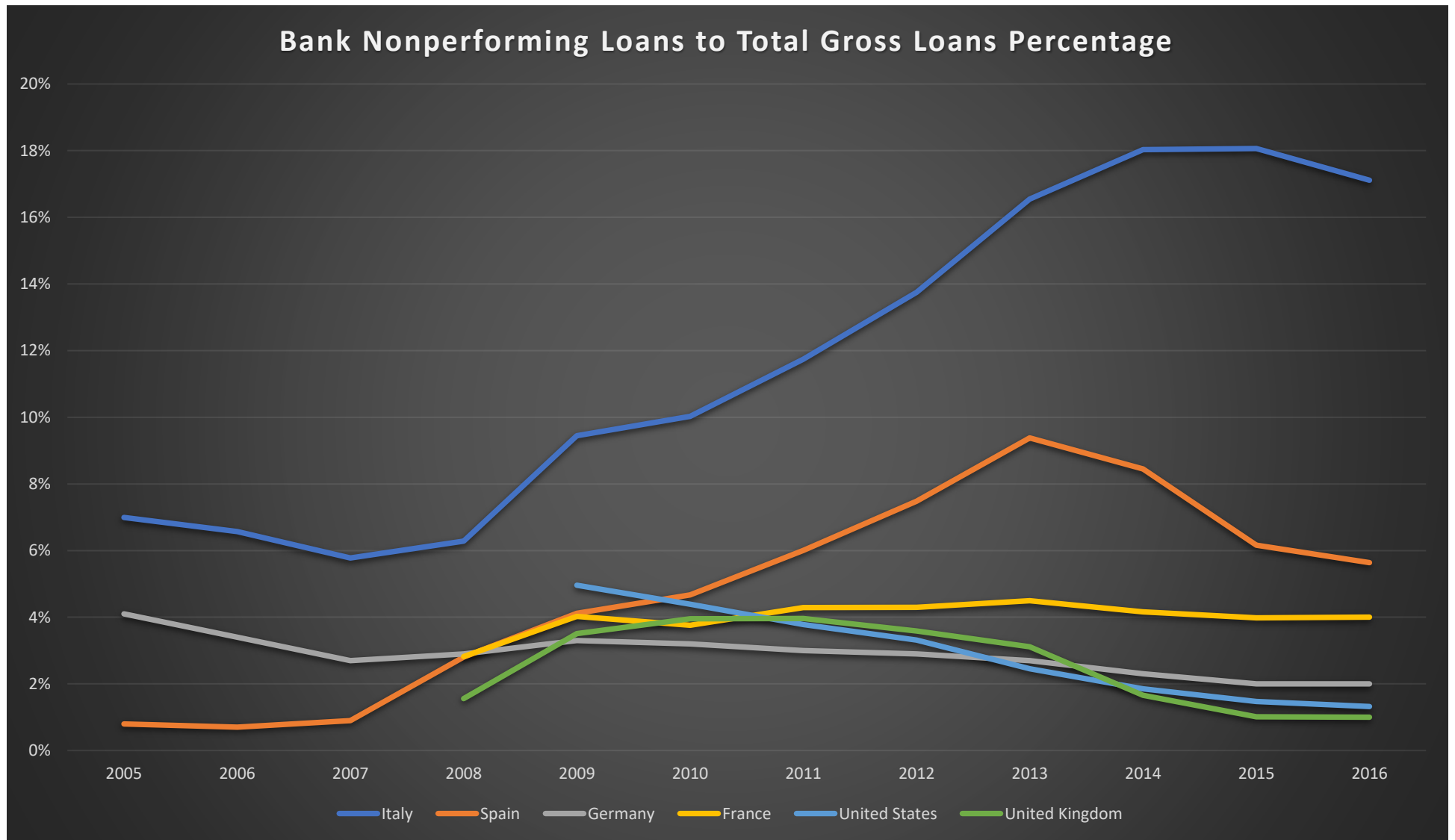


Figure 17. Bank Nonperforming Loans to Total Gross Loans Percentage

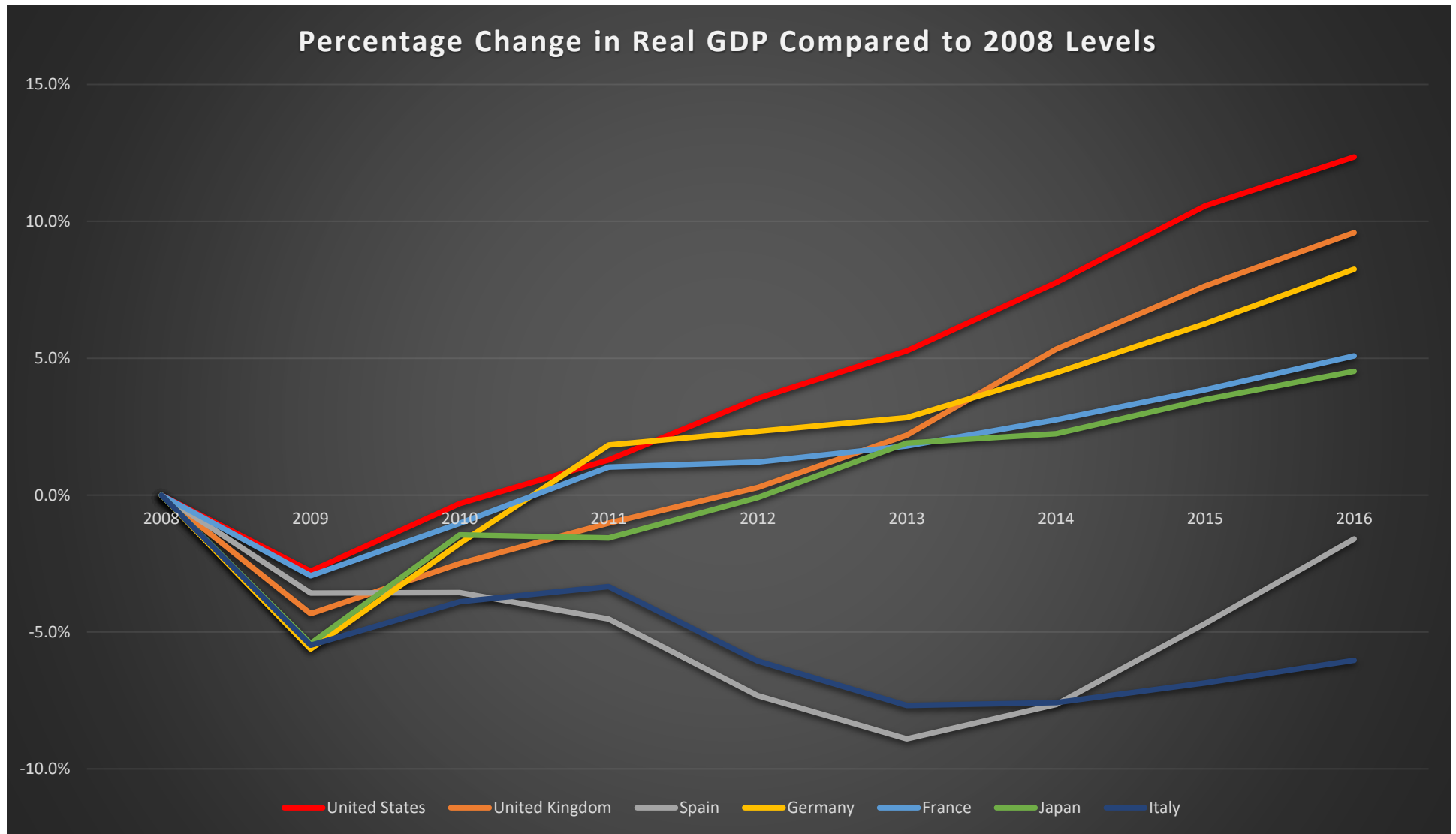


Figure 18. Percentage Change in Real GDP Compared to 2008 Levels

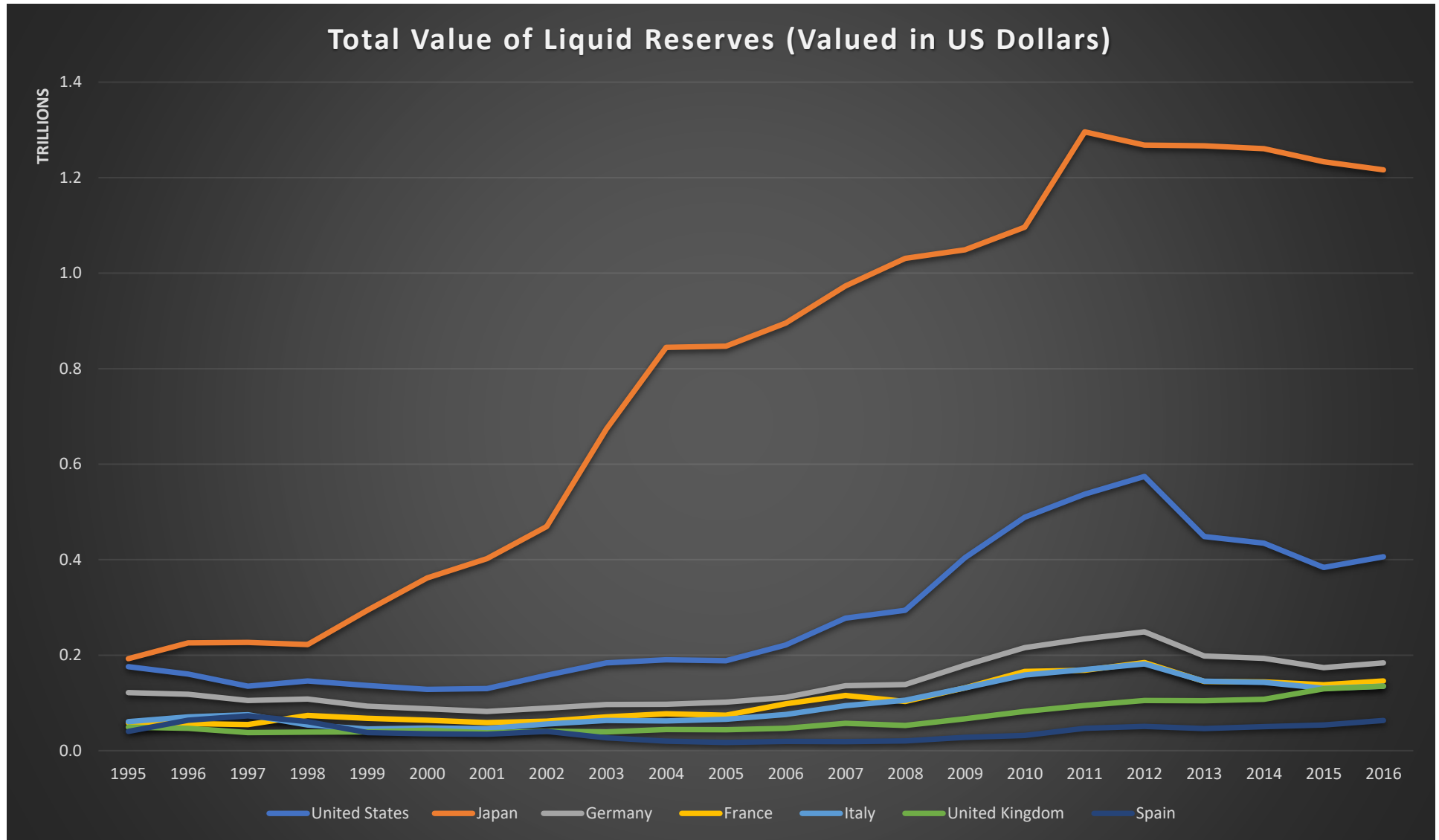


Figure 19. Total Value of Liquid Reserves (Valued in US Dollars)

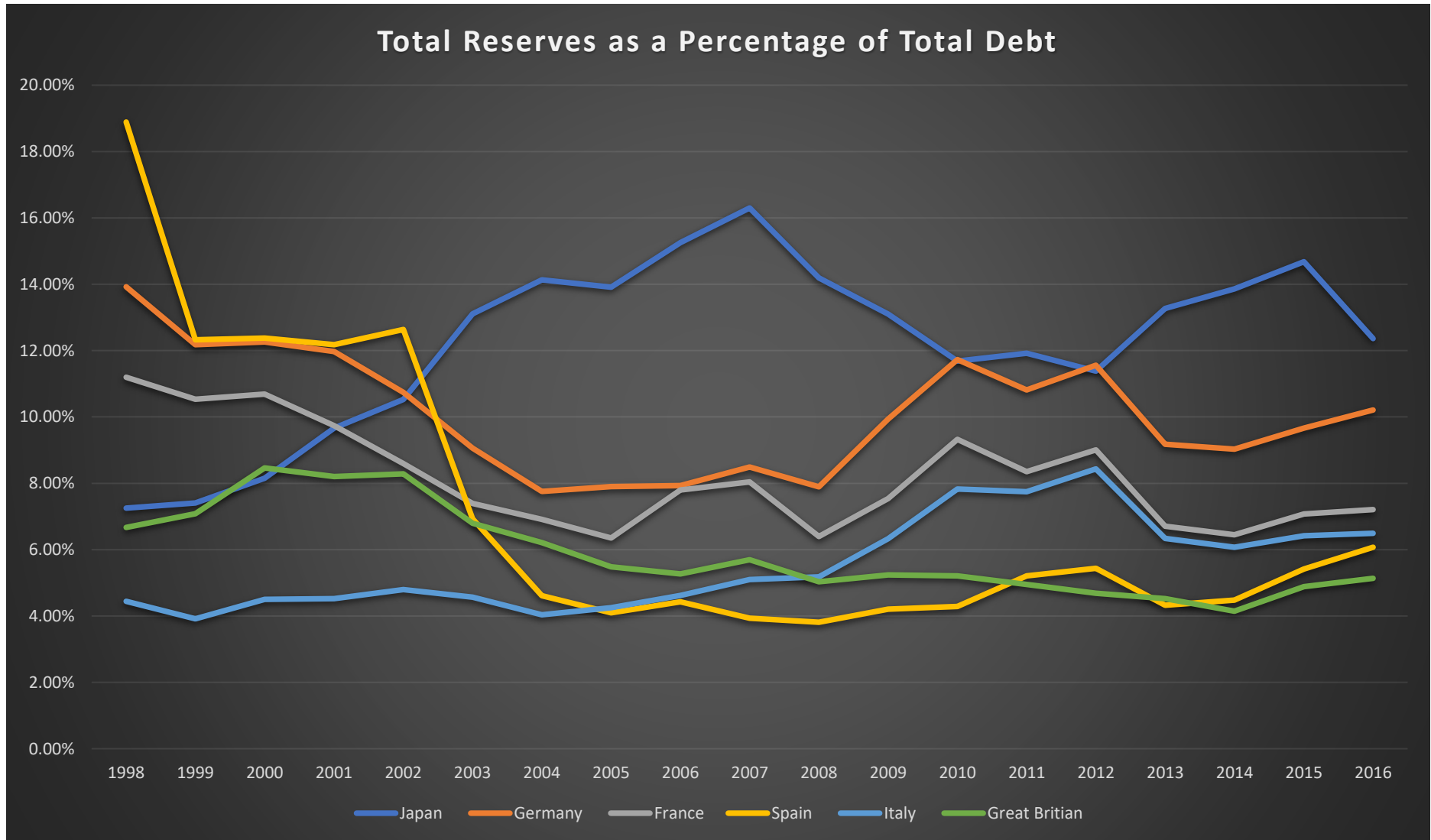


Figure 20. Total Reserves as a Percentage of Total Debt

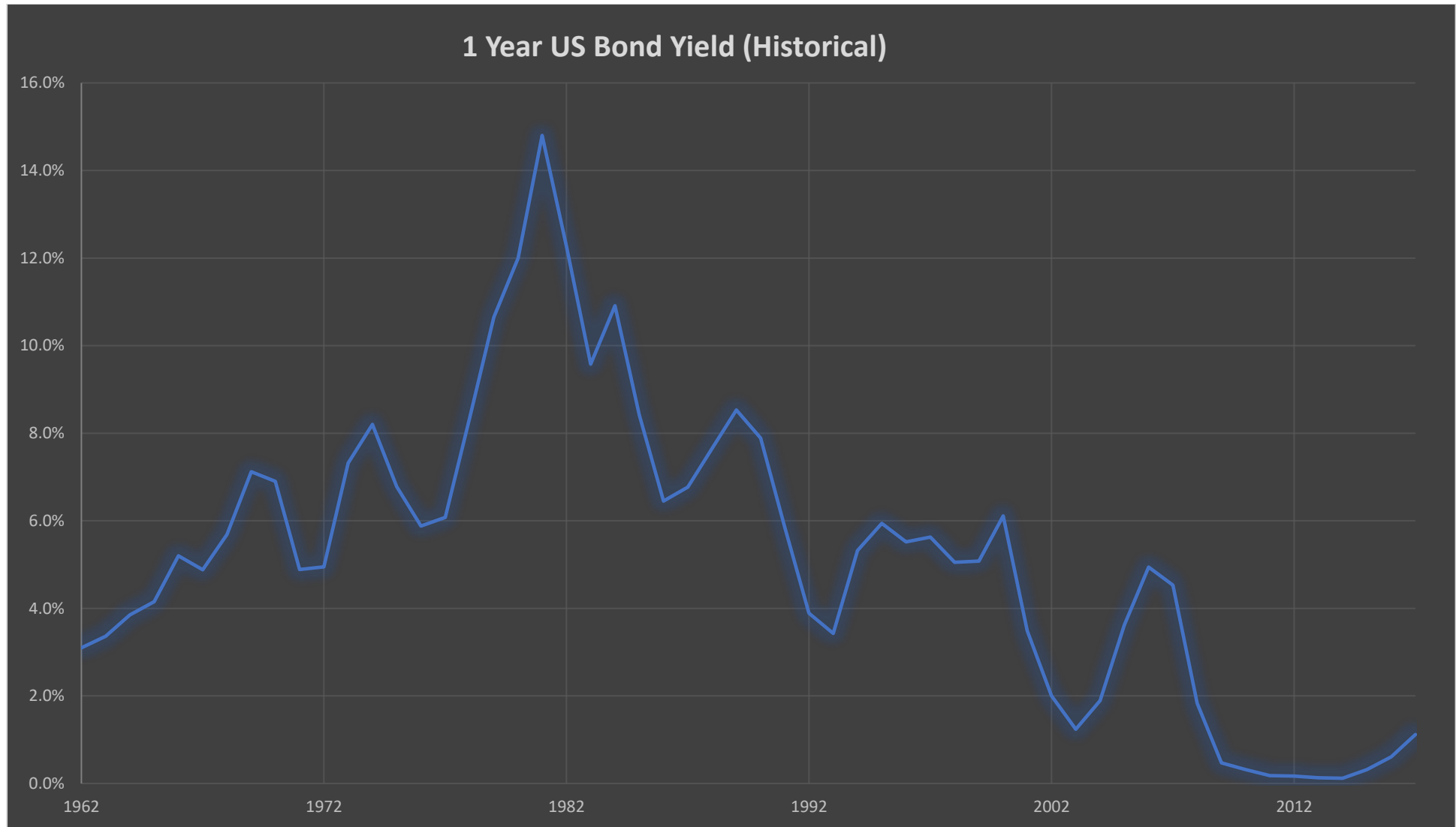


Figure 21. 1 Year US Bond Yield (Historical)

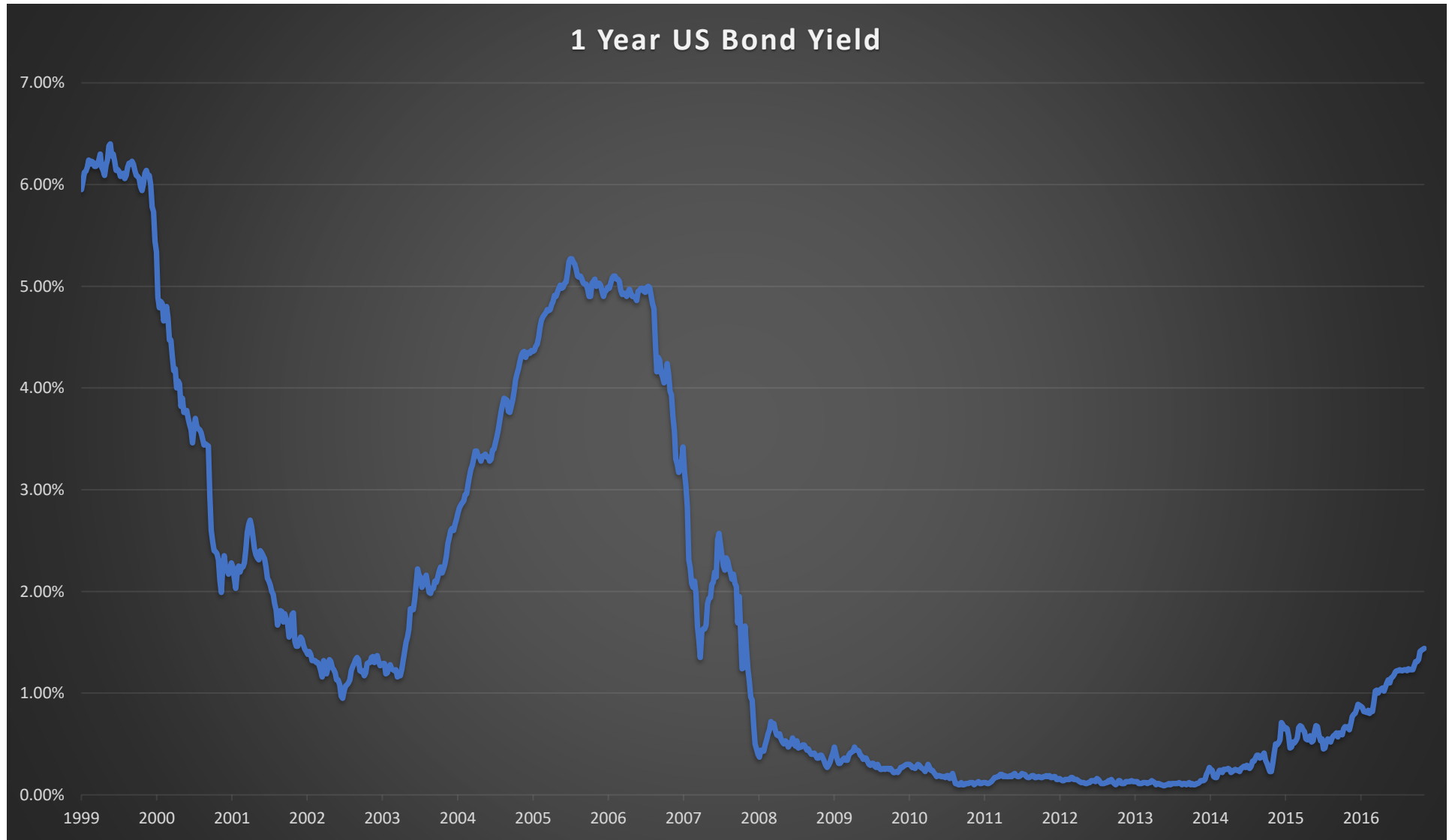


Figure 22. 1 Year US Bond Yield

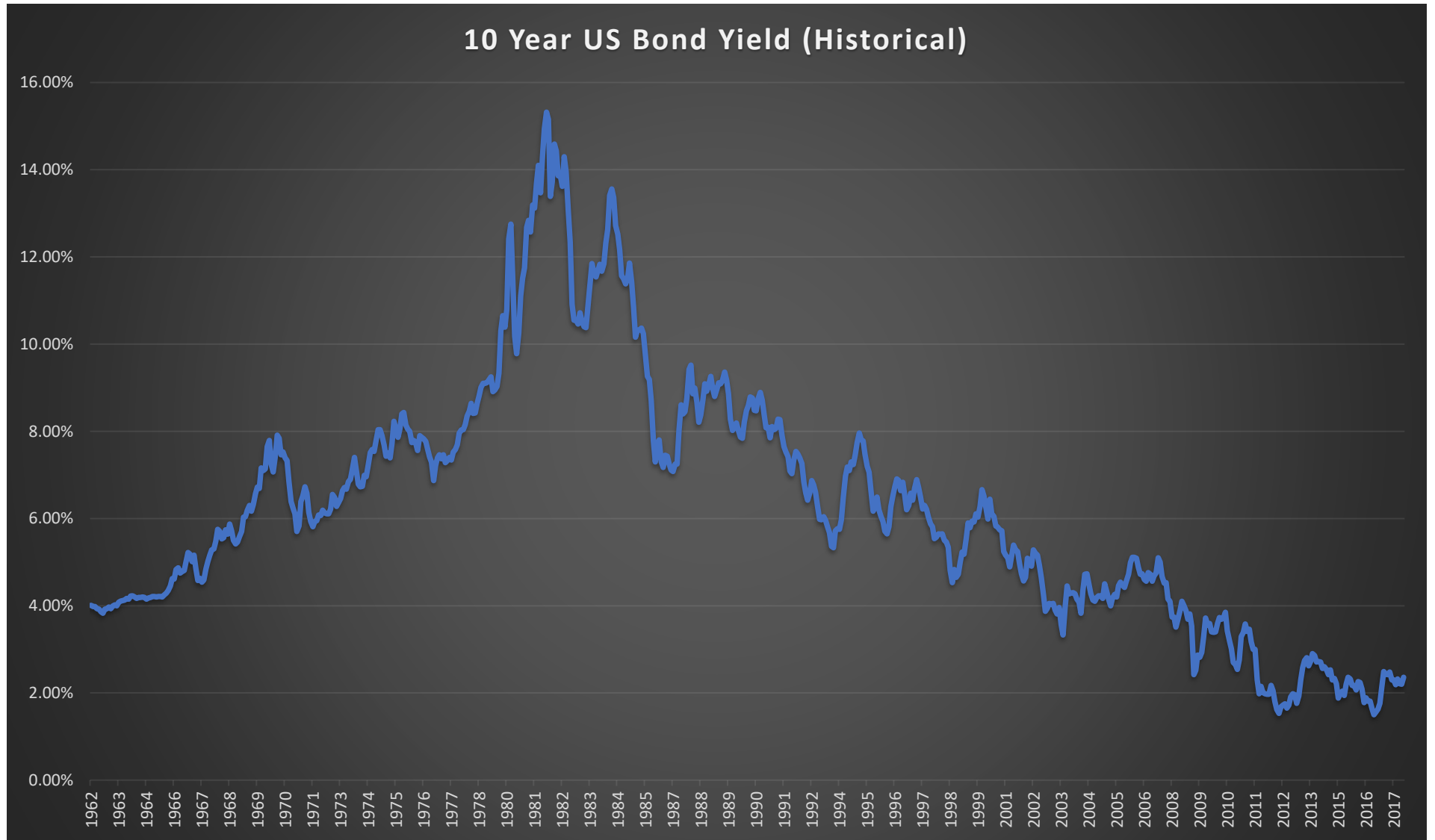


Figure 23. 10 Year US Bond Yield (Historical)

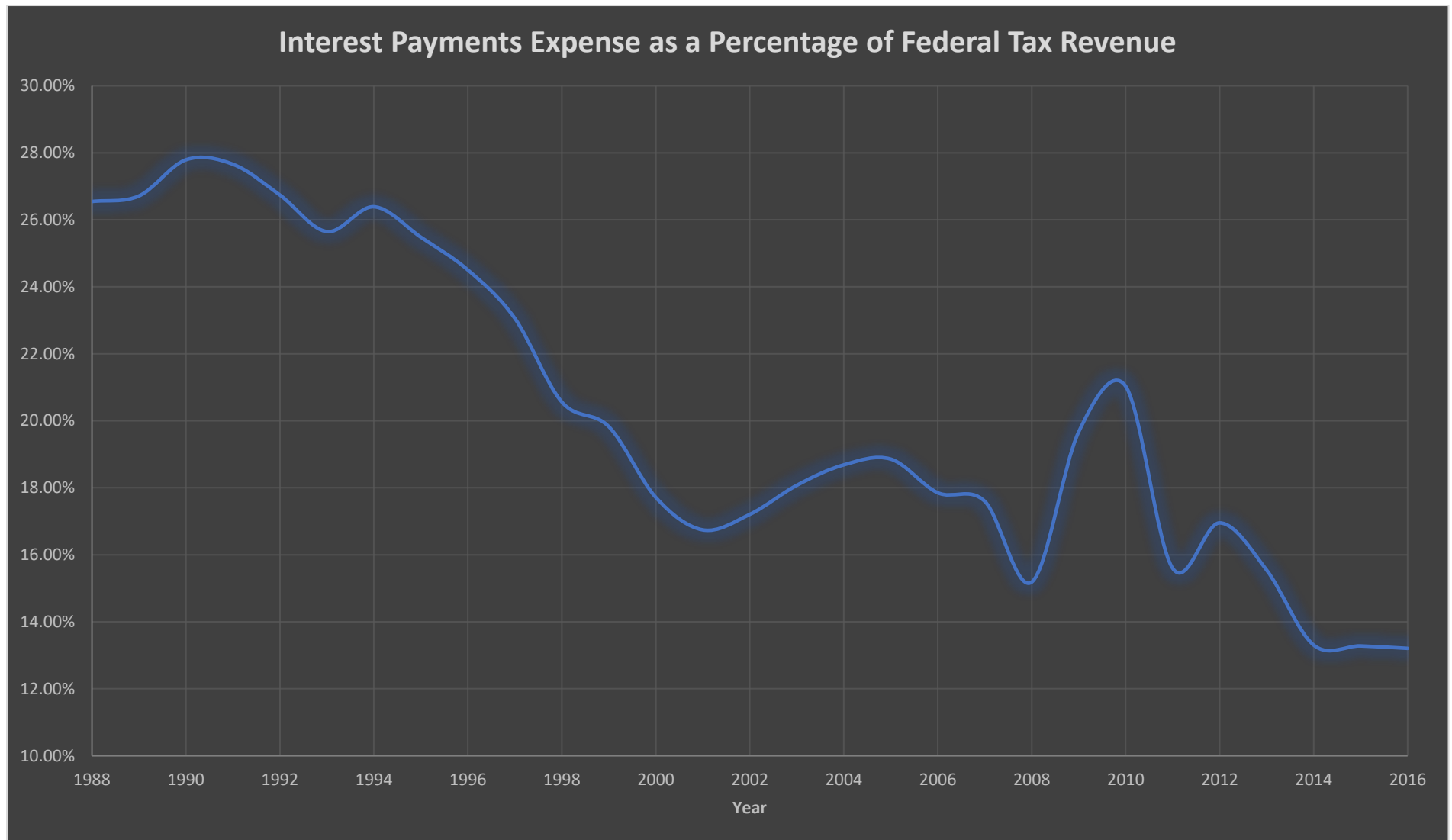


Figure 25. Interest Payments Expense as a Percentage of Federal Tax Revenue

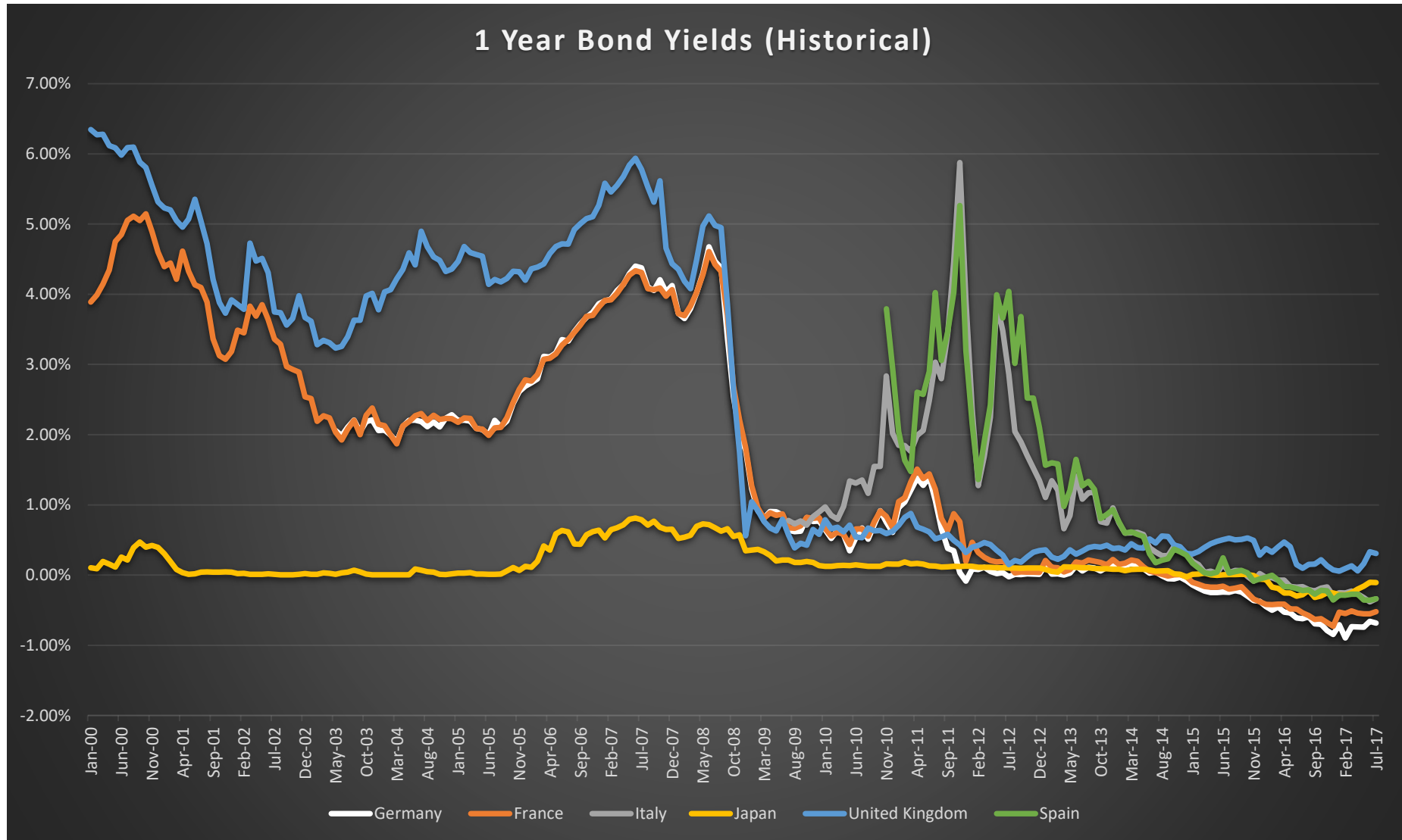


Figure 26. 1 Year Bond Yields (Historical)

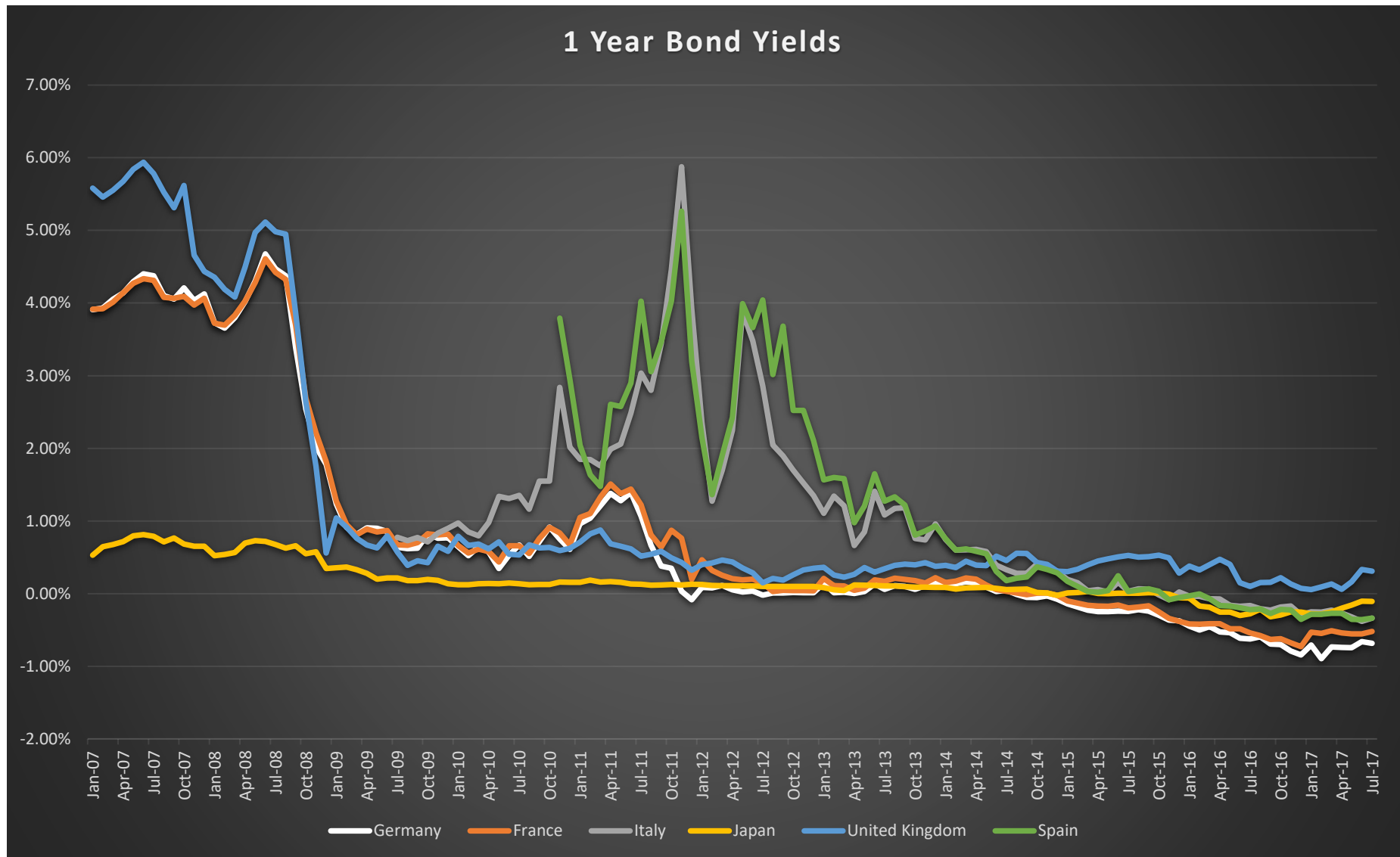


Figure 27. 1 Year Bond Yields

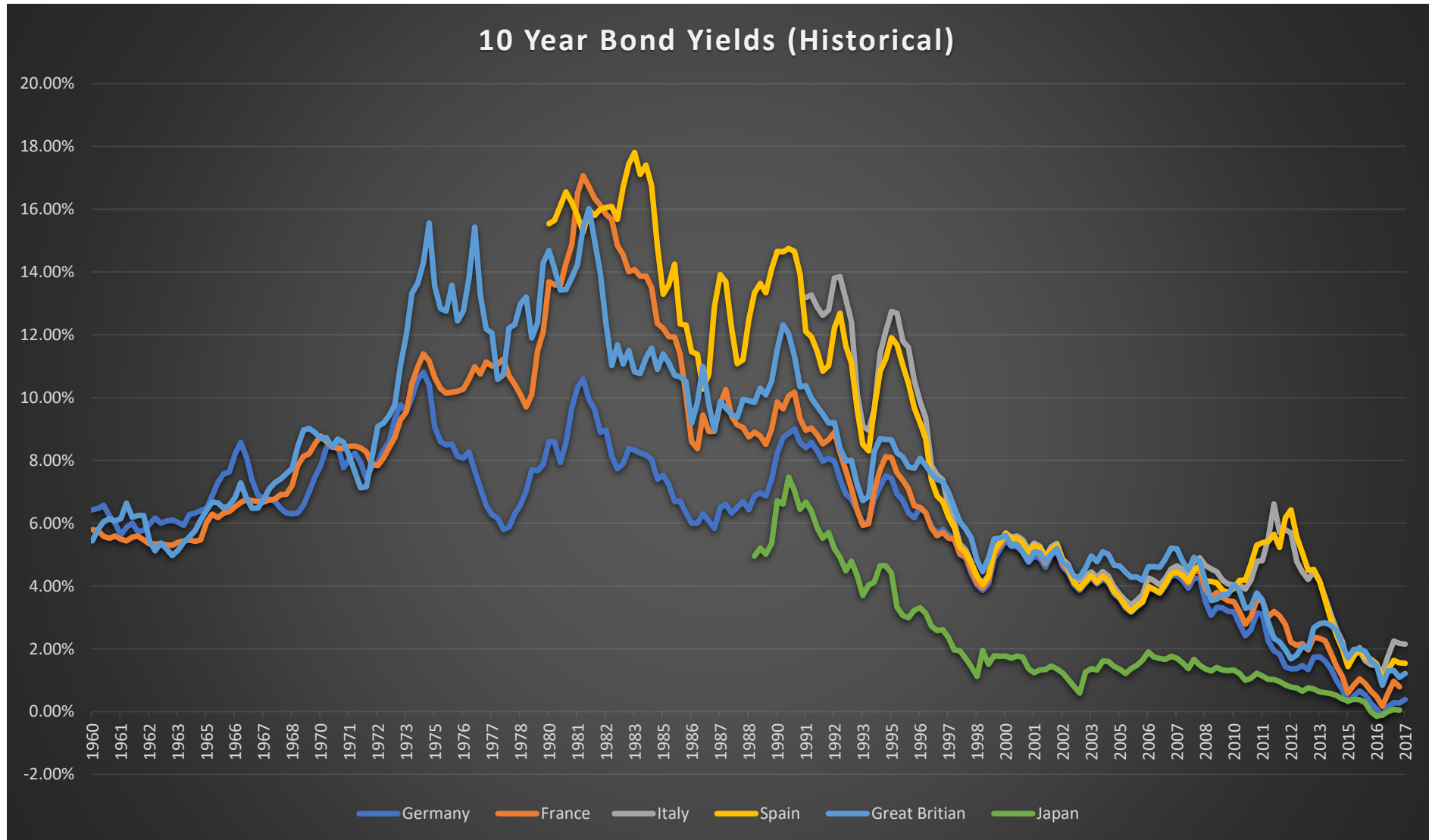


Figure 28. 10 Year Bond Yields (Historical)

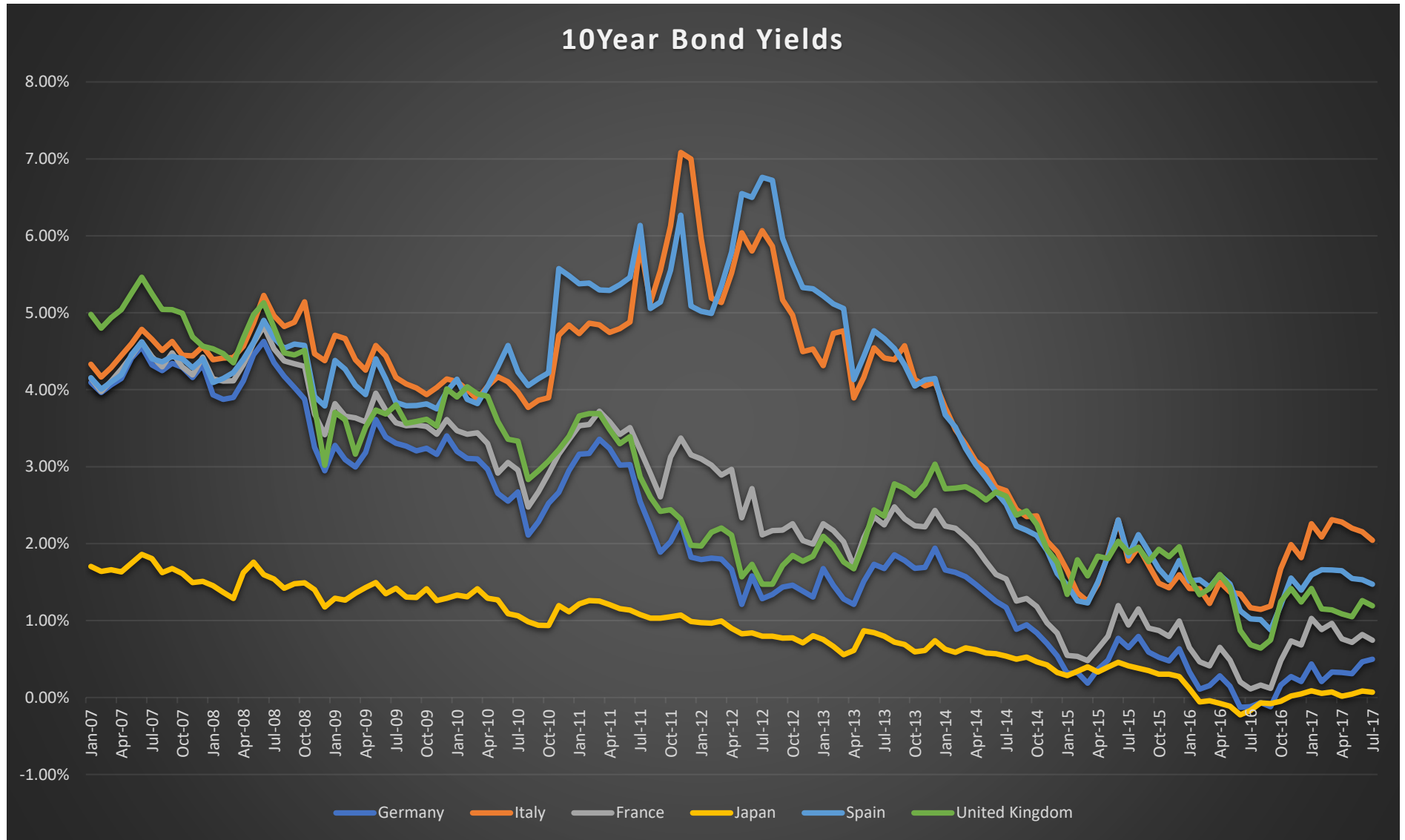


Figure 29. 10 Year Bond Yields

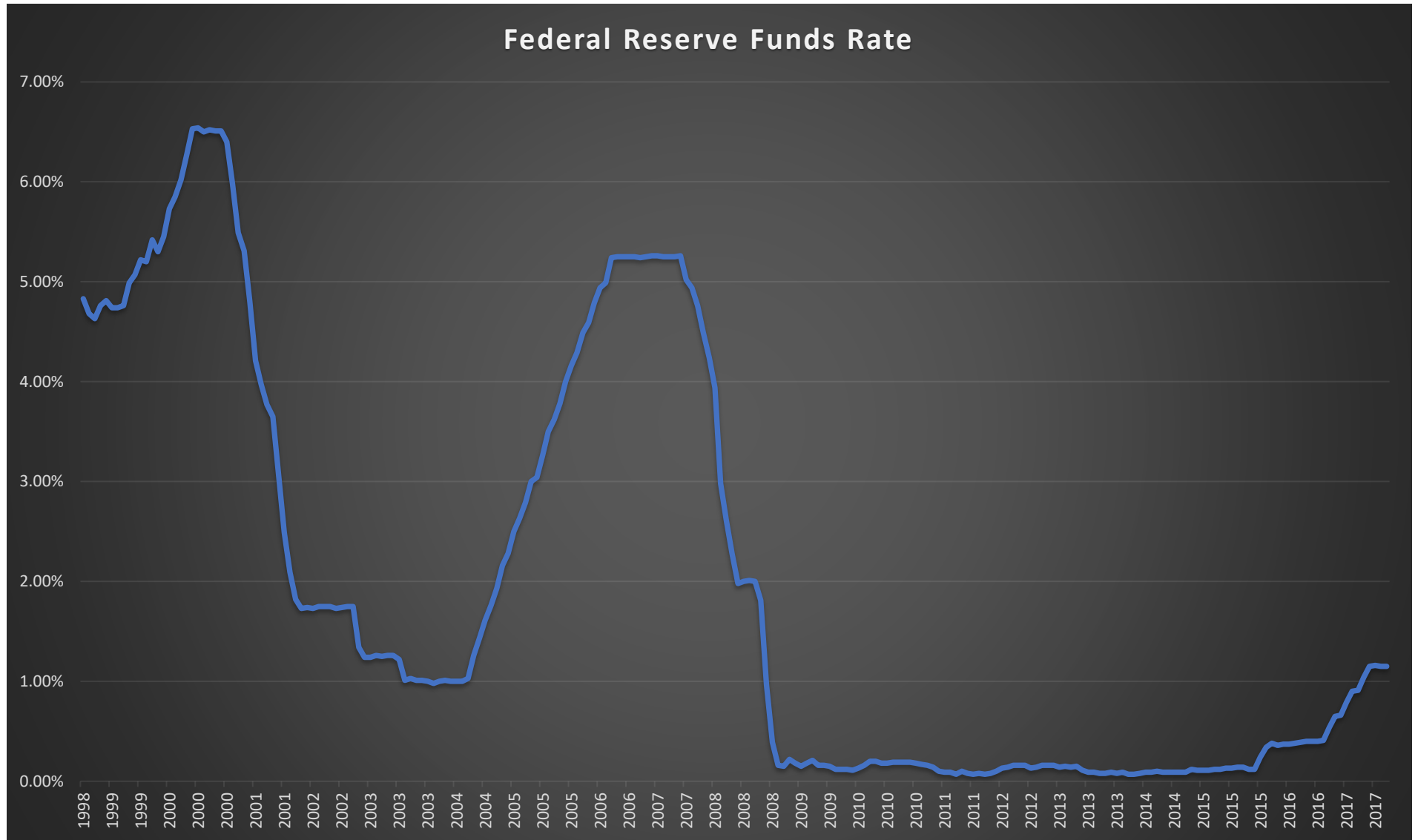


Figure 30. Federal Reserve Funds Rate

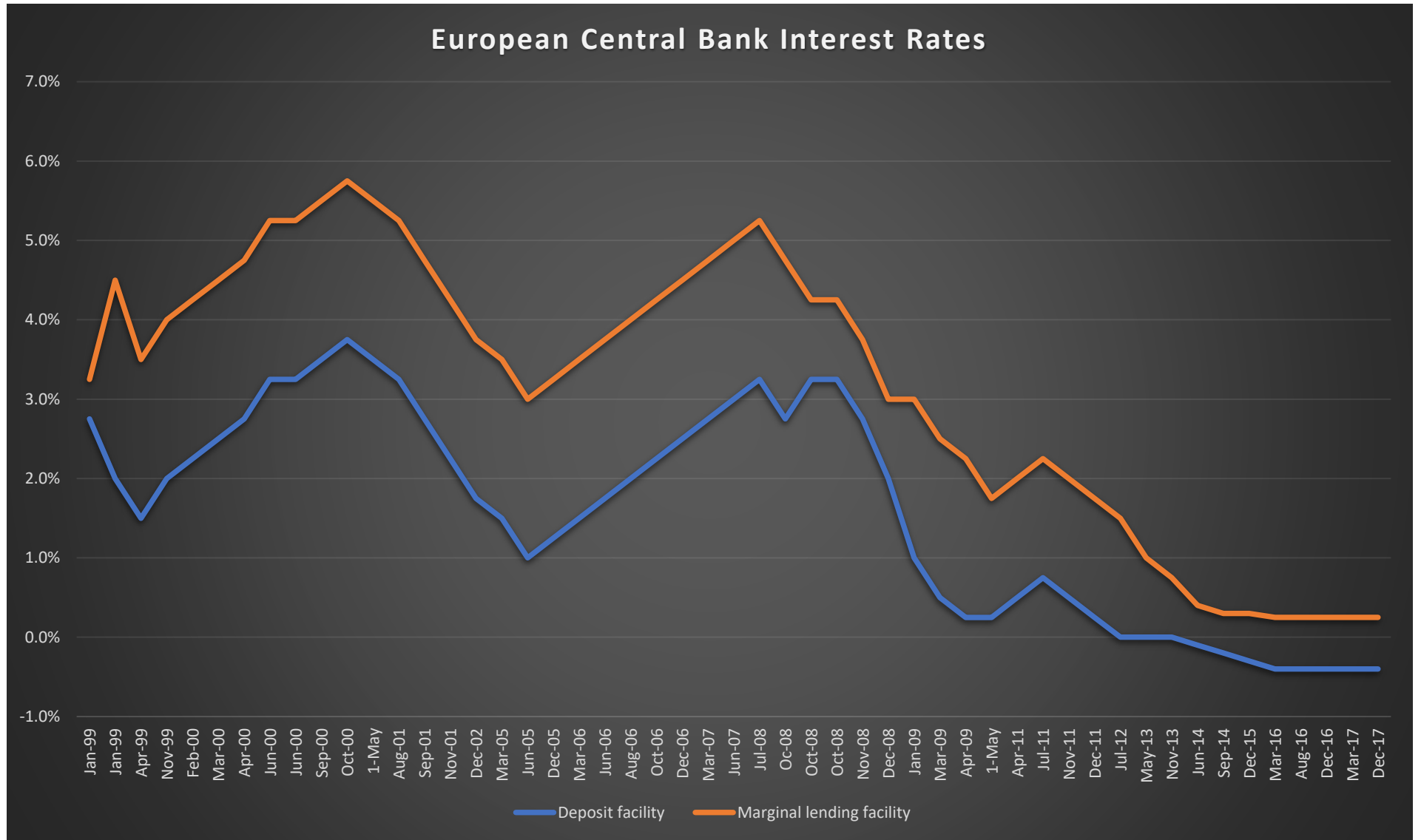


Figure 31. European Central Bank Interest Rates

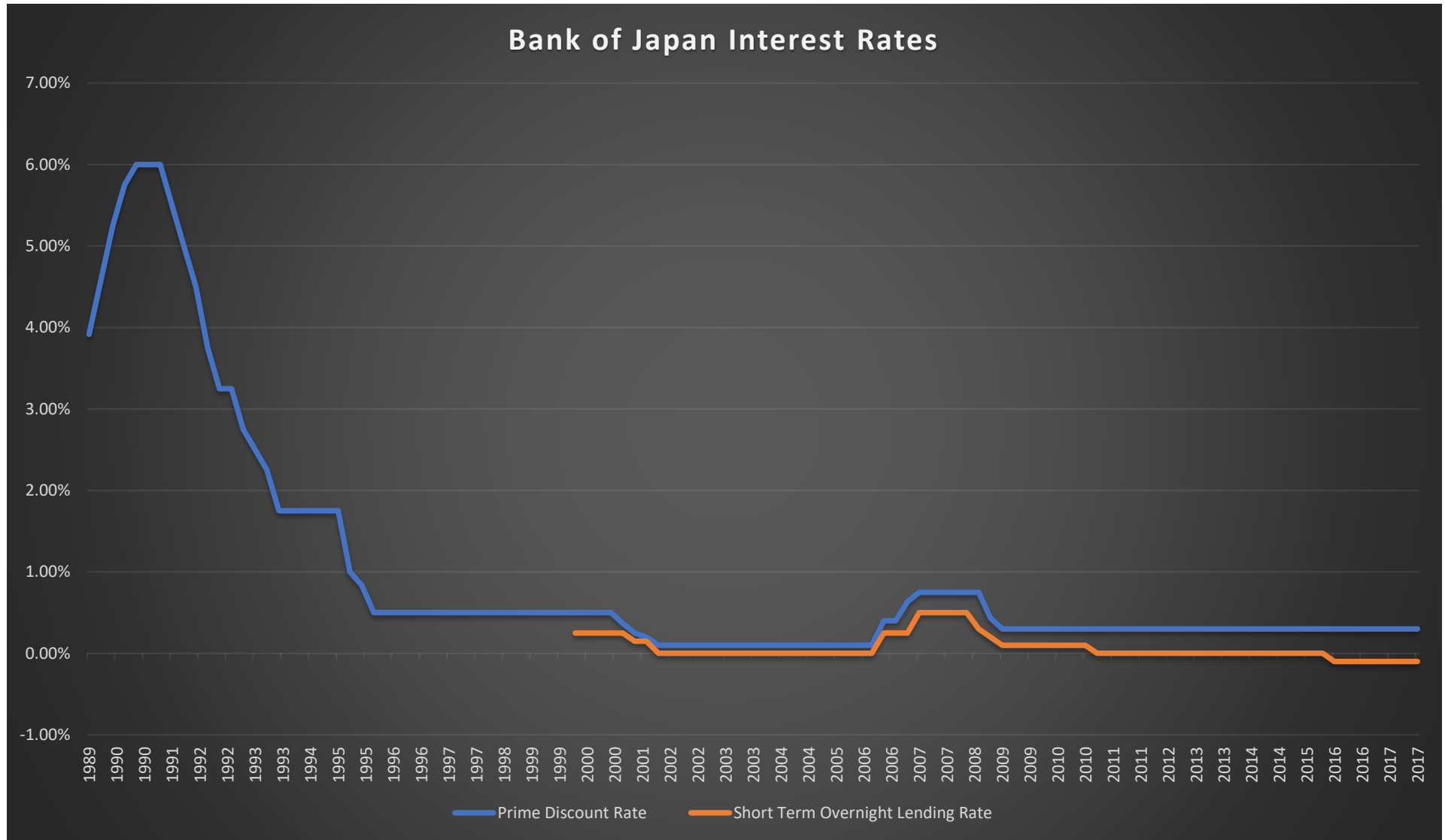


Figure 32. Bank of Japan Interest Rates

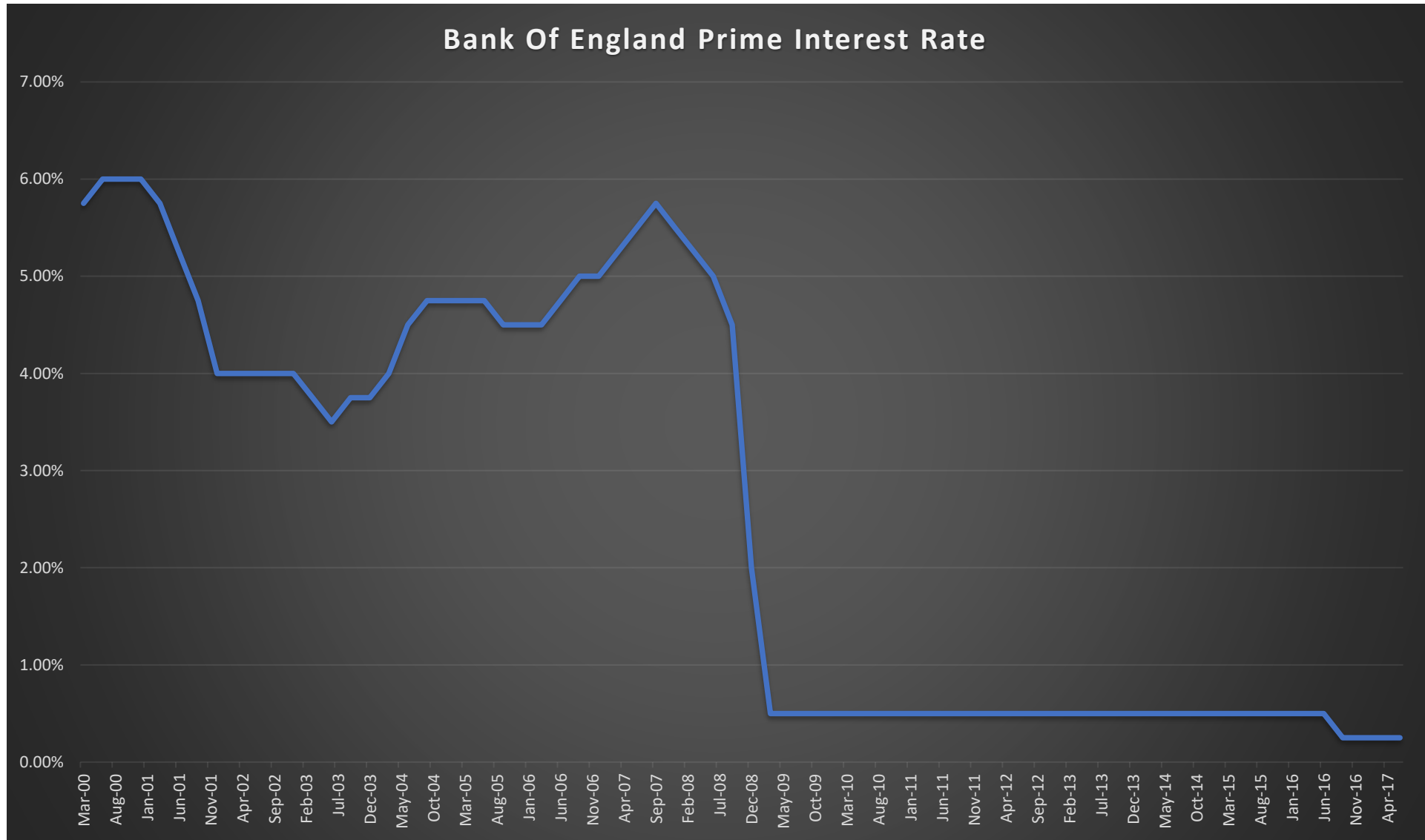


Figure 33. Bank of England Prime Interest Rate

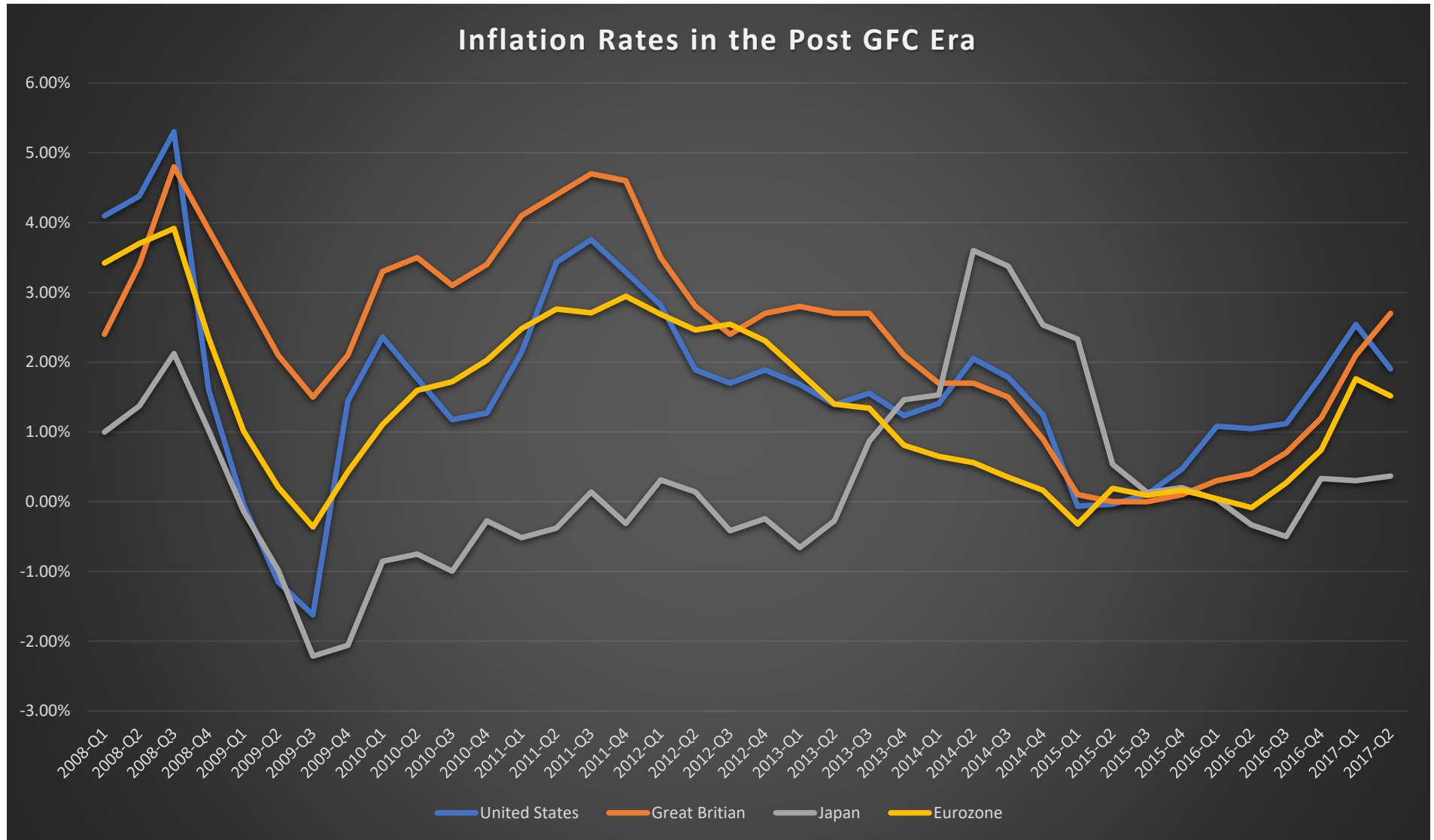


Figure 34. Inflation Rates in the Post GFC Era

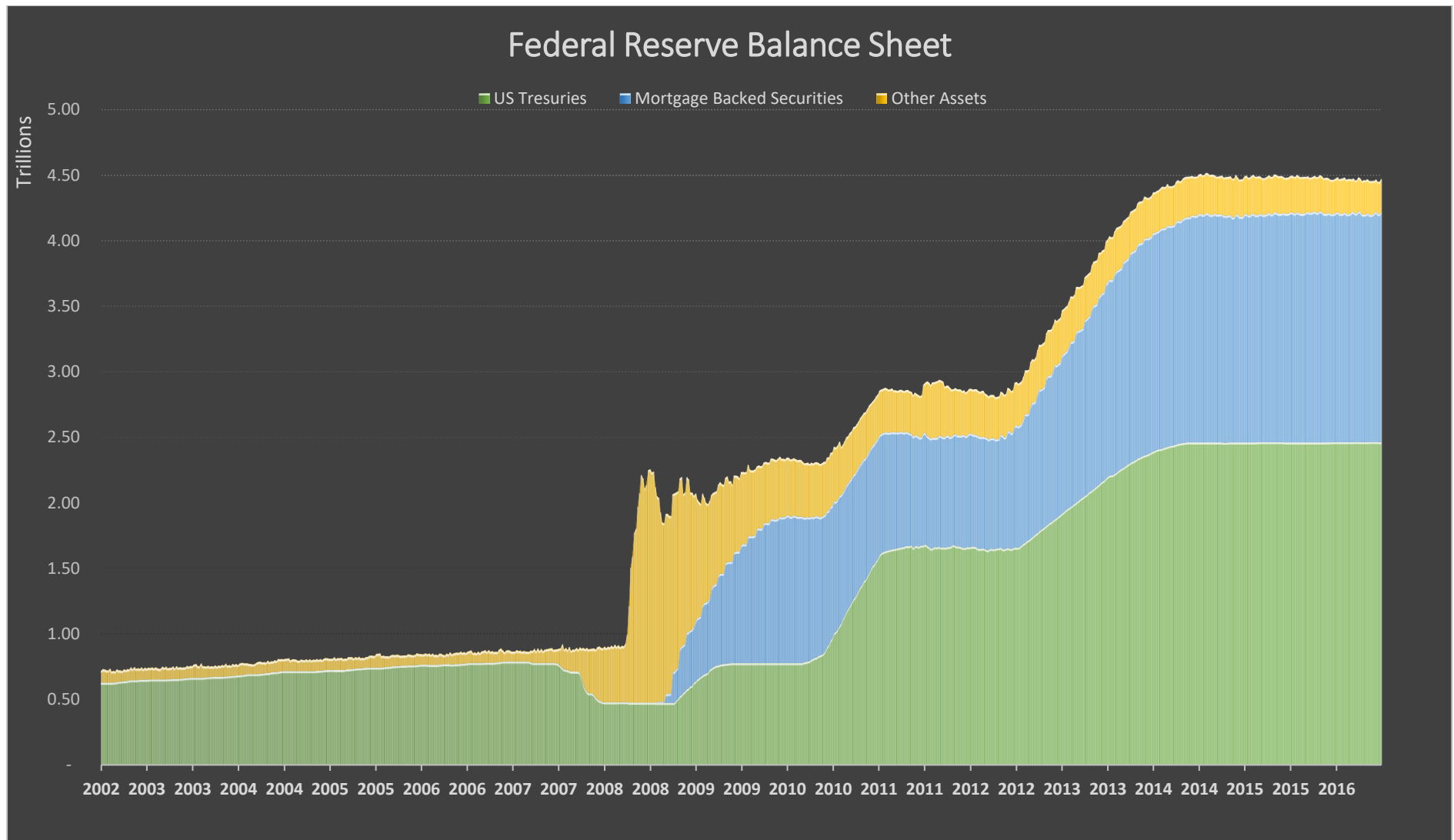


Figure 35. Federal Reserve Balance Sheet

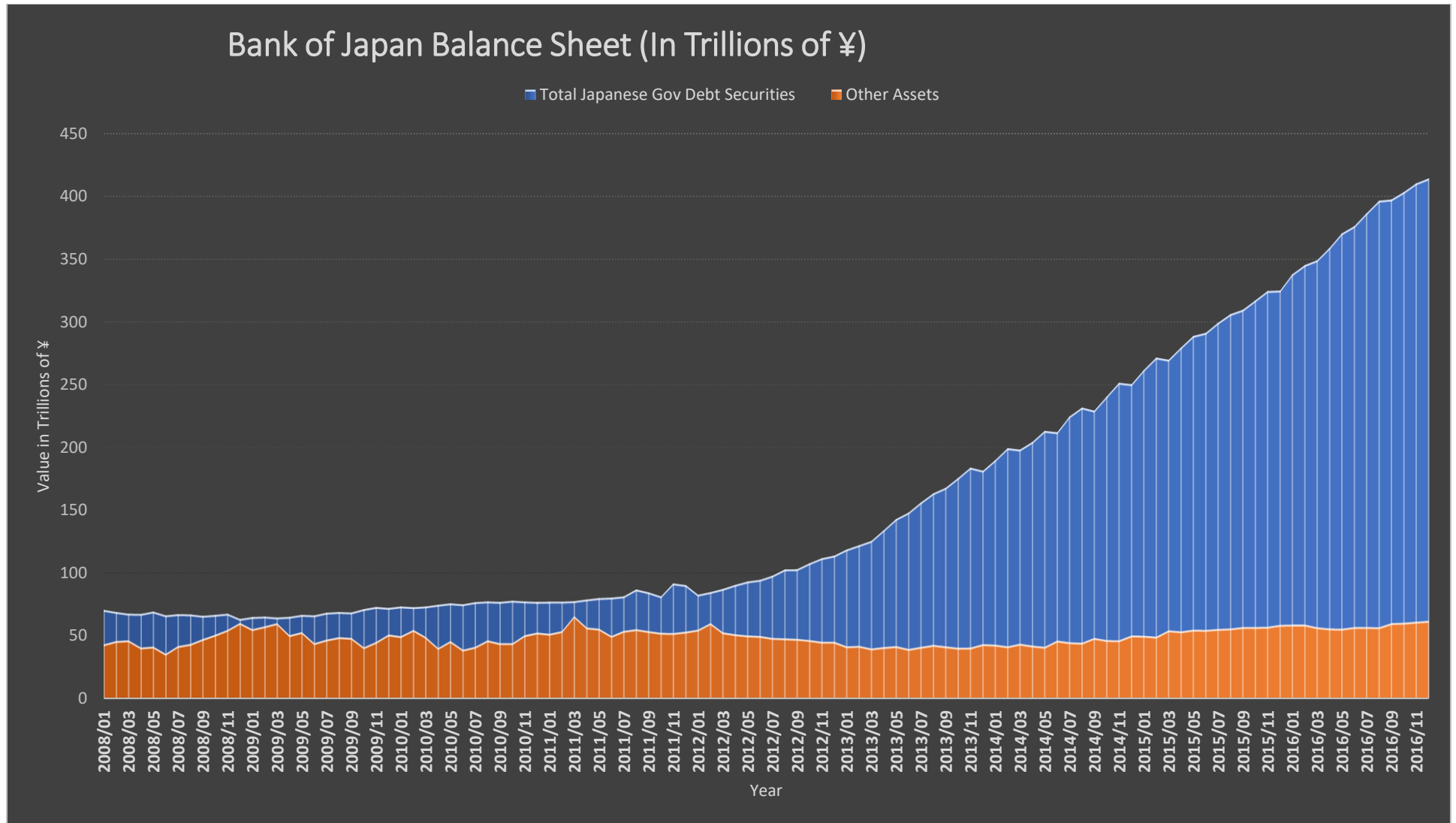


Figure 36. Bank of Japan Balance Sheet (In Trillions of ¥)

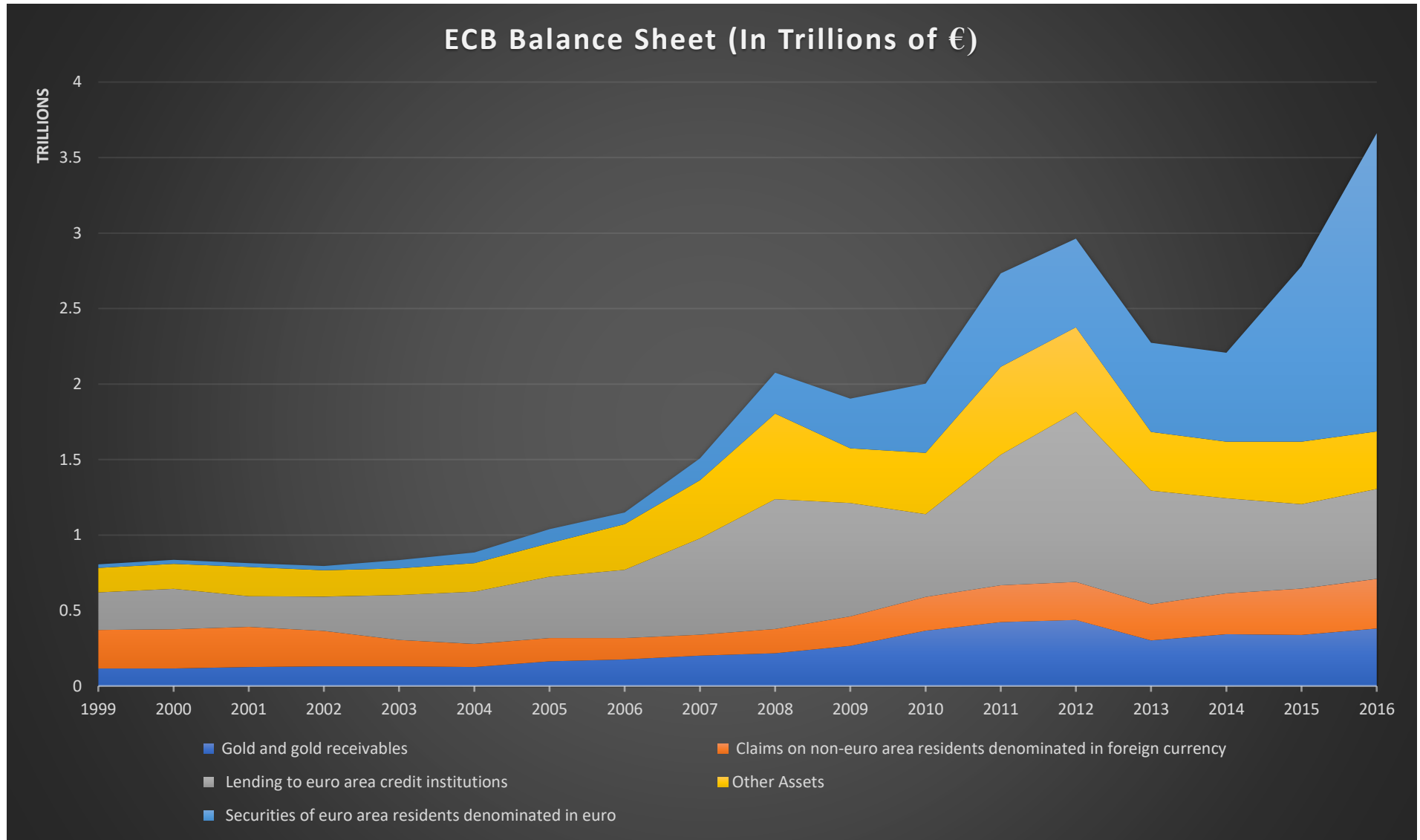


Figure 37. ECB Balance Sheet (In Trillions of €)

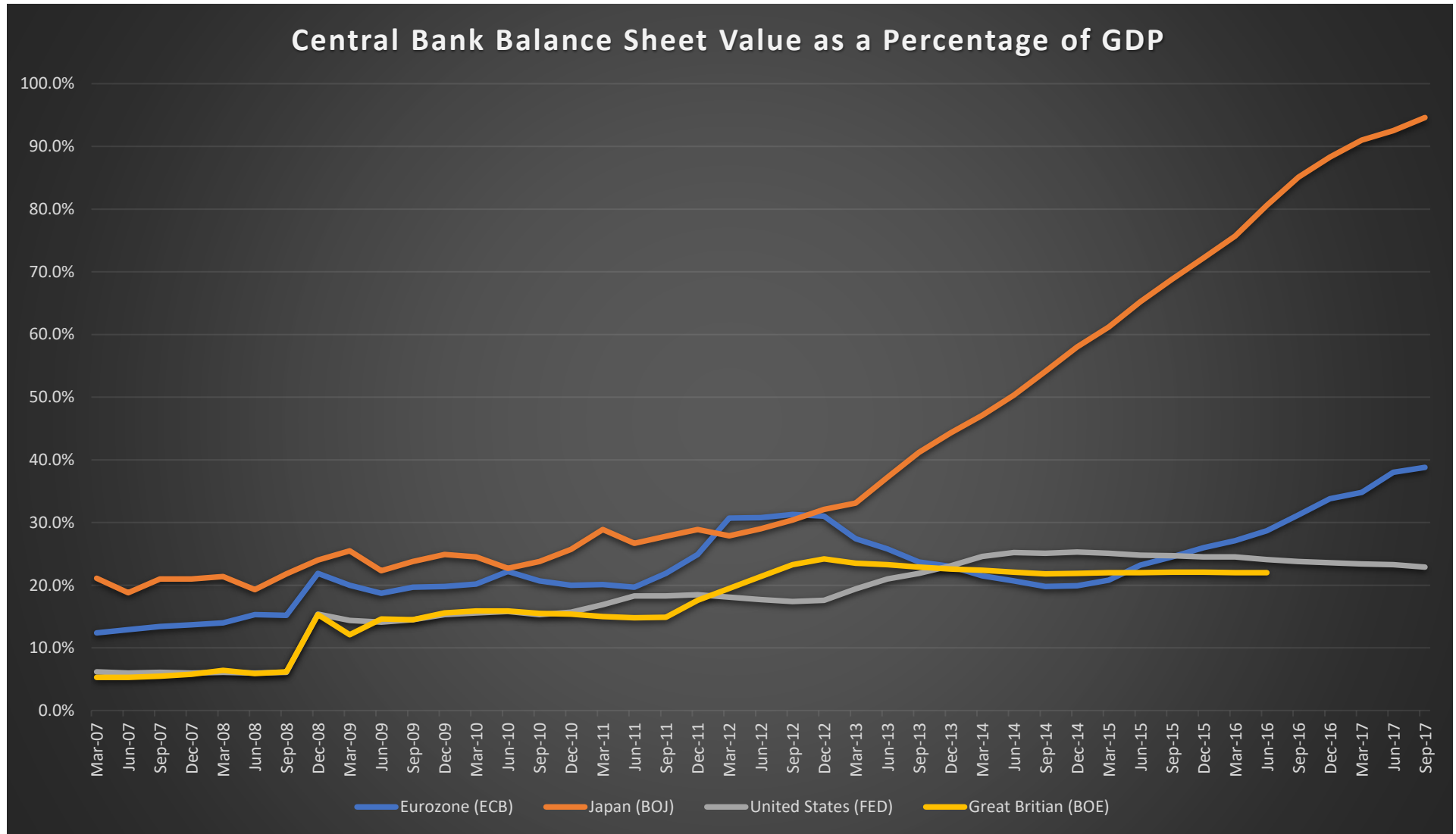


Figure 38. Central Bank Balance Sheet Value as a Percentage of GDP

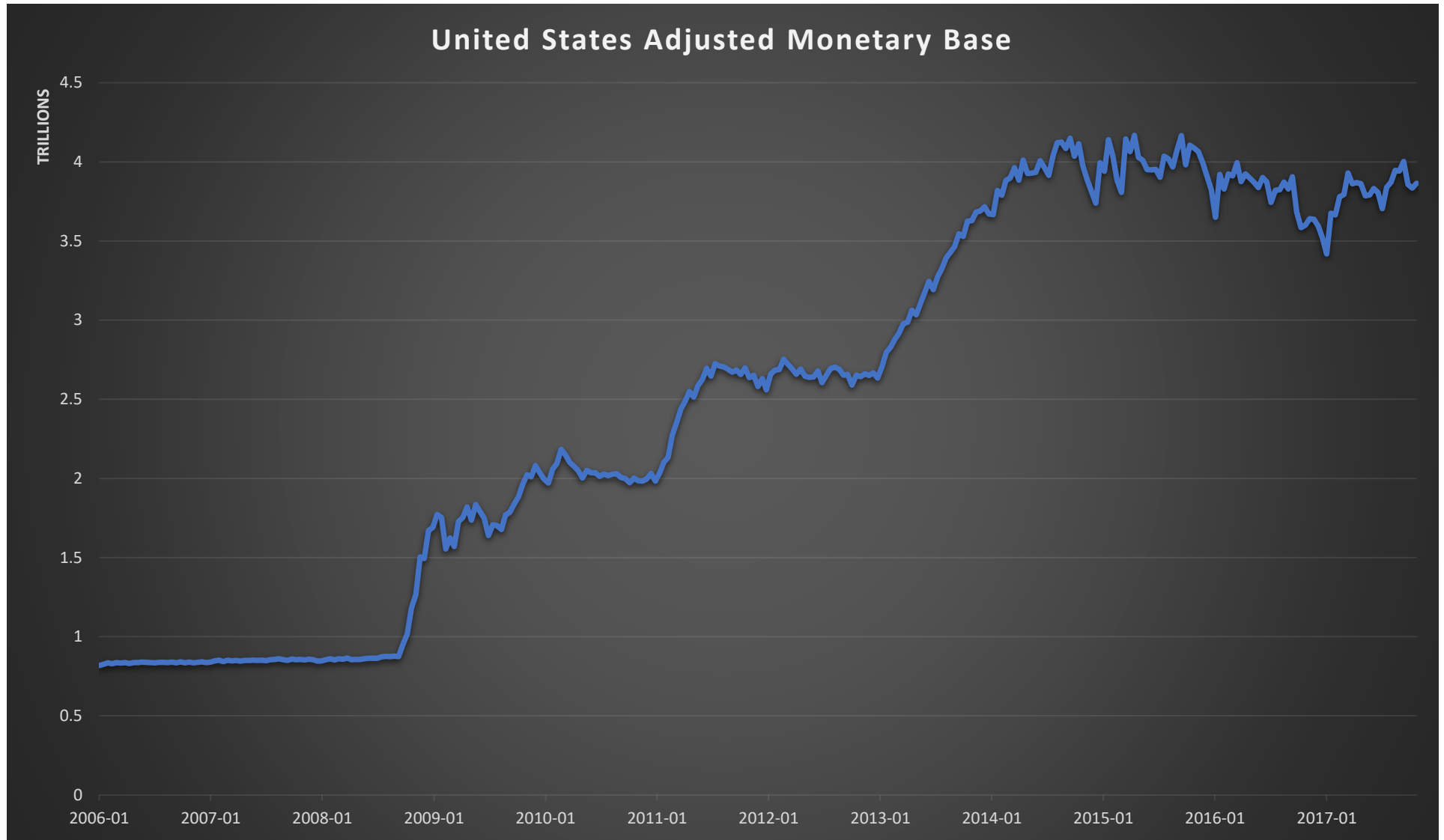


Figure 39. United States Adjusted Monetary Base

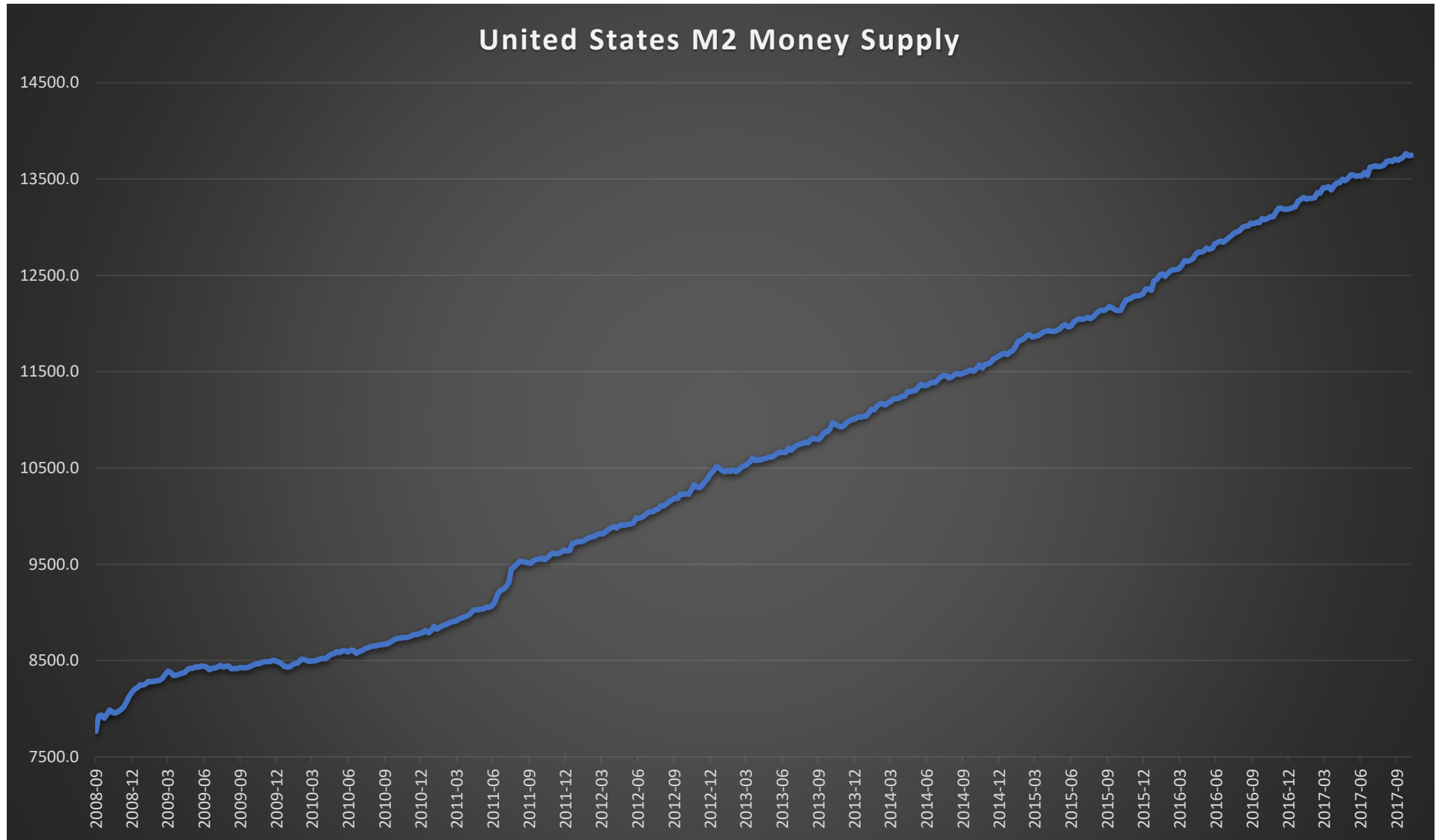


Figure 40. United States M2 Money Supply

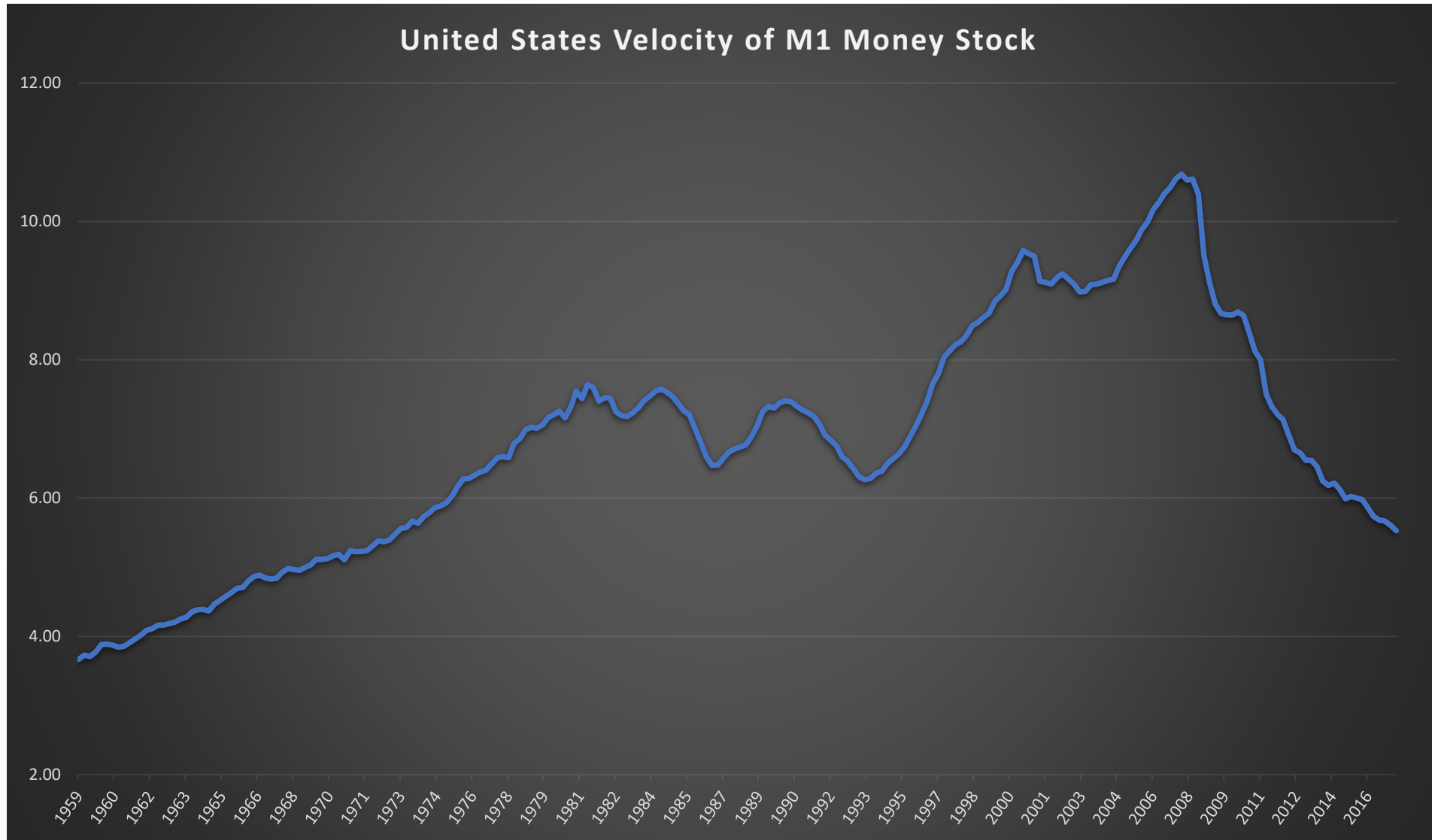


Figure 41. United States Velocity of M1 Money Stock

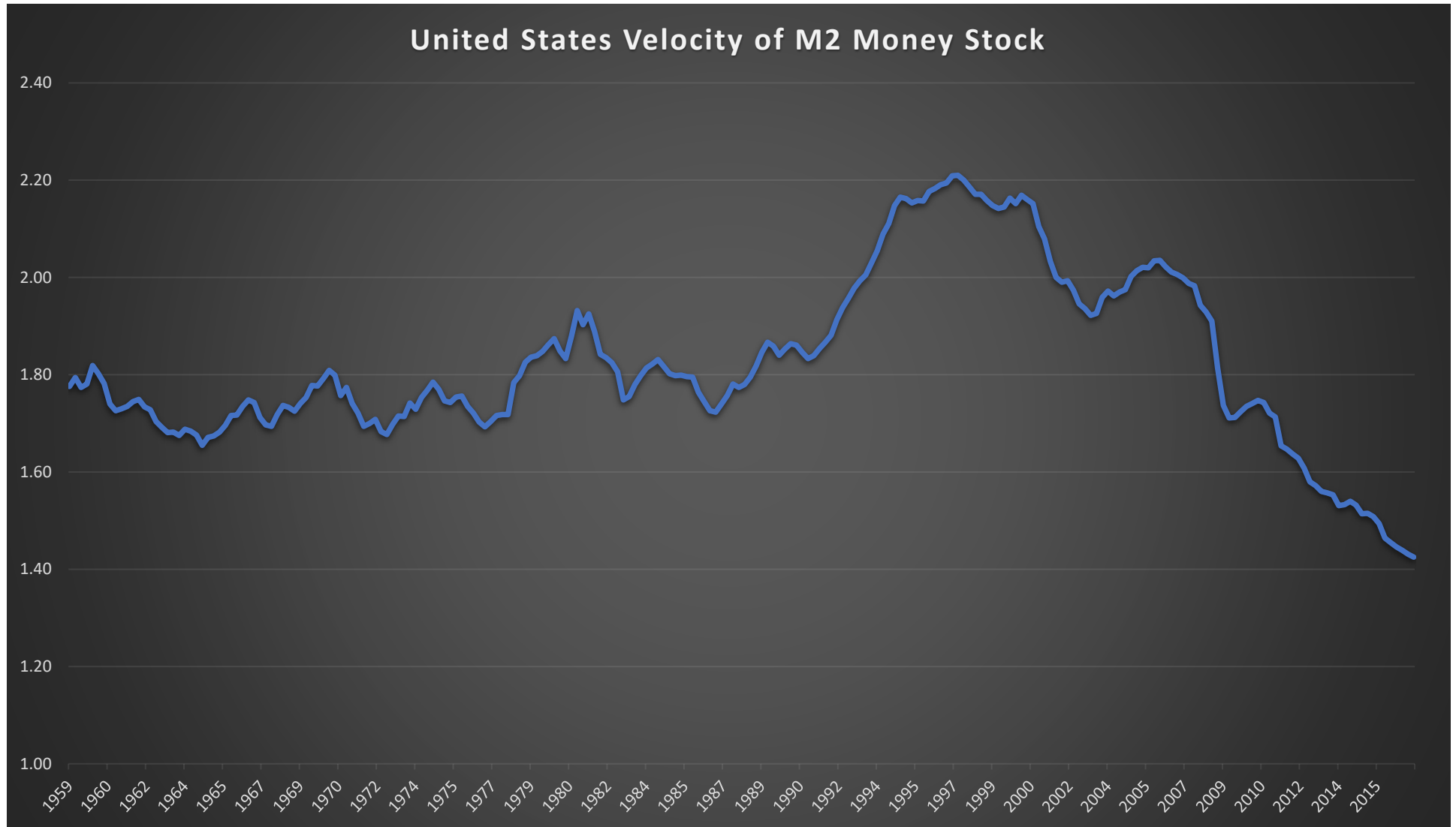


Figure 42. United States Velocity of M2 Money Stock

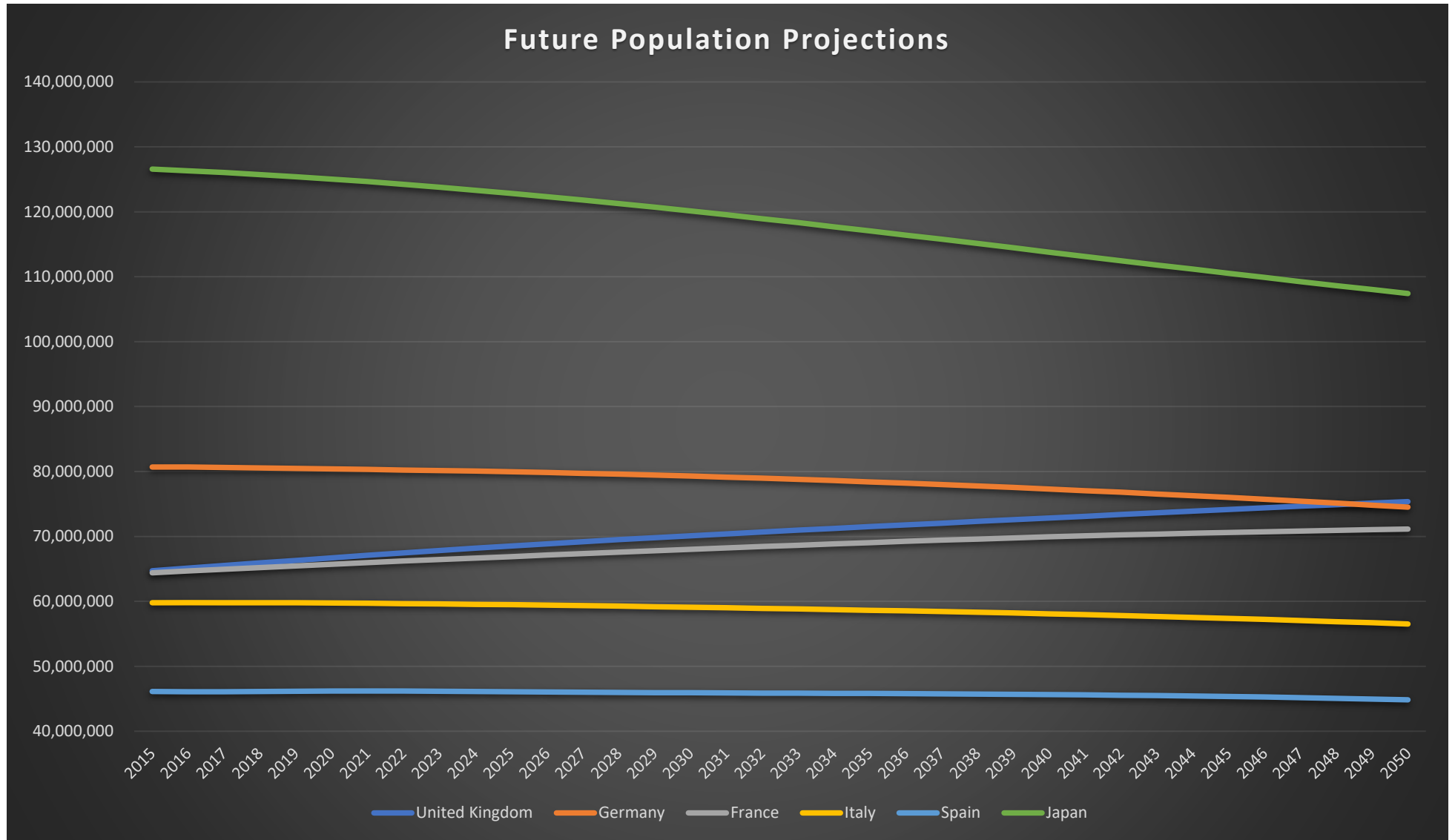


Figure 43. Future Population Projections

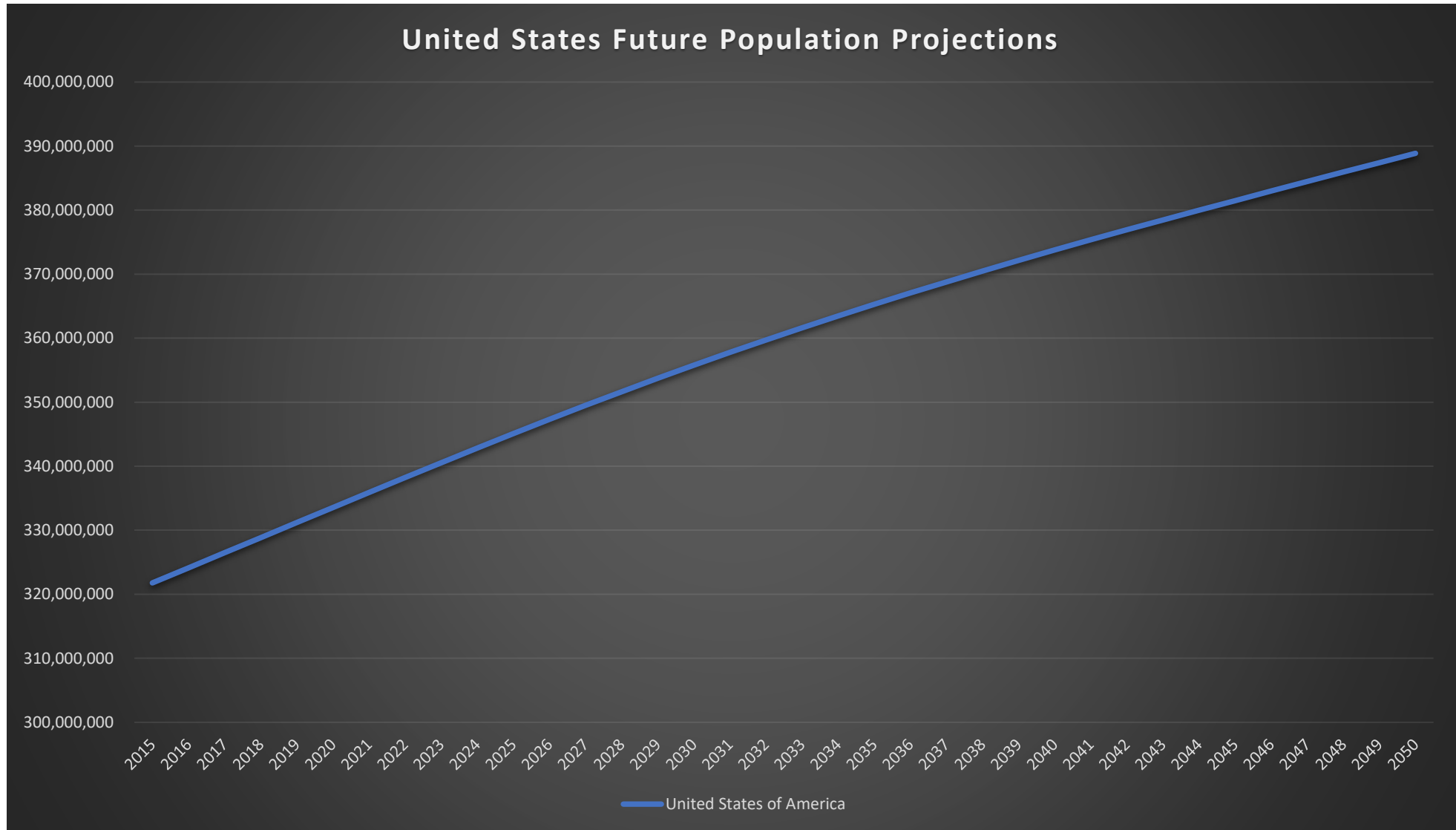


Figure 44. United States Future Population Projections

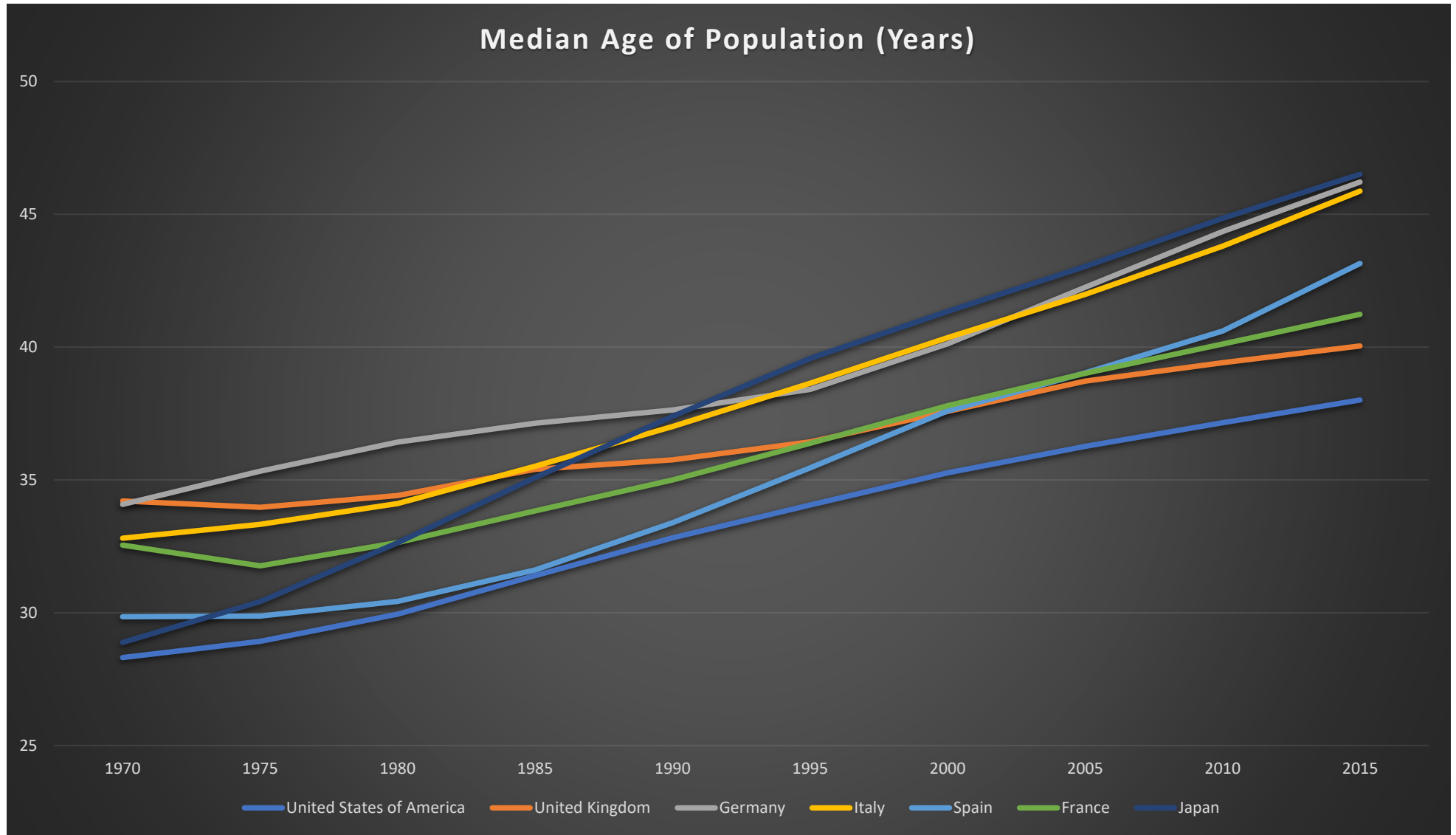


Figure 45. Median Age of Population (Years)

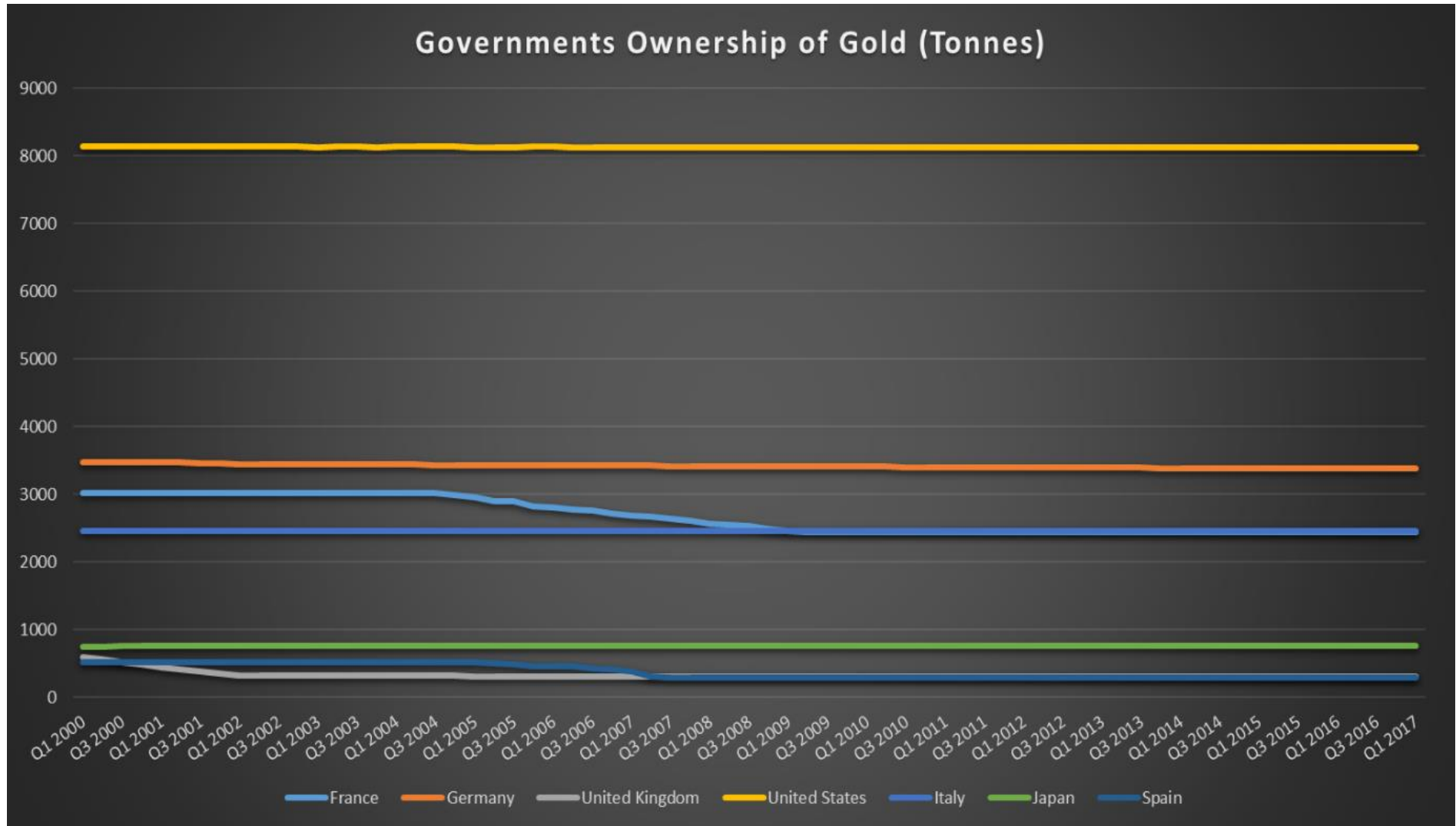


Figure 46. Governments Ownership of Gold

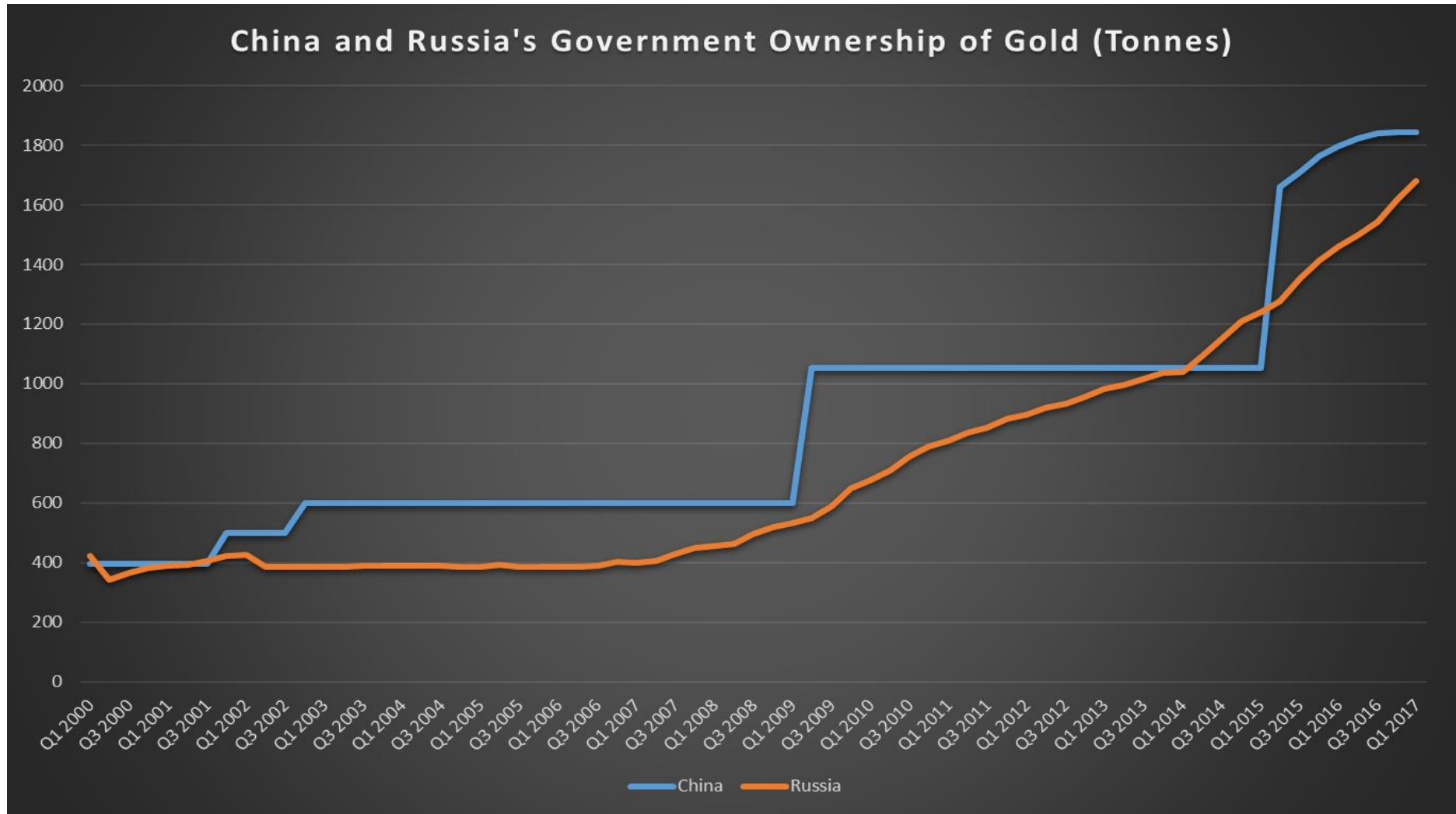


Figure 47. China and Russia's Government Ownership of Gold (Tonnes)