

# OVERCOMING THE NOTION OF A SINGLE REFERENCE CURRENCY

A Currency Basket Approach

- The usual practice of wealth management relies on defining the reference currency. However, many wealthy families with a global footprint have liabilities and financial objectives in a number of currencies.
- The world is becoming increasingly multipolar, and the dominance of the US dollar as the world reserve currency over the long term cannot be taken for granted.
- This leads us to abandon the notion of a single reference currency in favor of a customized basket of currencies that better represents liabilities and financial objectives for wealthy families with a global footprint.
- The Global Reserve Currency Index, as a proxy for the world currency, can be used as a currency allocation when the currency exposure of financial objectives is not known.

Giuseppe Balocchi, CFA, and H elie d'Hautefort



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# Overcoming the Notion of a Single Reference Currency: A Currency Basket Approach

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## SUMMARY

Wealthy families with a global footprint have liabilities and financial objectives in multiple currencies. In examining how families should manage currency risk, we find it necessary to revisit the functions of money as a store of value, a unit of account, and a medium of payment and to take a fresh look at the concept of risk in light of geopolitical changes. This approach leads us to abandon the notion of a single reference currency in favor of a customized basket of currencies, representing liabilities and financial objectives. We introduce the Global Reserve Currency Index, a useful proxy for the world currency. It can be used as a currency allocation benchmark when the currency exposure of financial objectives is not known. The currency basket approach we present enables wealthy families to benefit from reserve currency management techniques that are also used by central banks.

## INTRODUCTION

The most basic questions are often the hardest ones to answer, but if we ignore them, we do so at our peril. This is particularly true in finance because of the inherent difficulty of laying solid theoretical or empirical foundations for decision making under uncertainty. The practice of wealth management rests on the choice of the reference currency, which is usually taken to be the currency of the investor's country of residence

or sometimes, for lack of a more compelling alternative, the US dollar. The basic question of the economic meaning of money is rarely posed with the required depth. Yet the increasing geographical reach of wealthy families in a globalized world with fiat currencies makes it imperative that we consider how the objective of preserving and increasing real wealth relates to the reference currency assumption.

This discussion explores how globalization and changing geopolitics make it absolutely necessary to take a fresh look at currencies when setting up successful long-term wealth management strategies. The economic meaning of money is not an empty theoretical debate but a deep and often ignored issue with far-reaching practical consequences. To set the scene, we revisit the notion of risk, shedding light on some aspects that are crucial in the context of this discussion. We then explore the economic meaning of money and briefly outline the currency challenges posed by current geopolitical trends for wealthy families with a global footprint. We show how the notion of a single reference currency is not applicable and must give way to a suitable currency basket that takes into account the currency composition of liabilities and objectives, is conceived to deal with the currency impact of geopolitical and economic trends, and achieves the benefits of currency diversification.

## REVISITING THE CONCEPT OF RISK

Given the essential importance of risk for wealth management, it is surprising that there is no commonly accepted definition of this critical concept.<sup>1</sup> Often, risk is measured as the standard deviation of returns, but it should not be forgotten that this statistic is a proxy for risk and, though certainly adequate for a number of applications, does not constitute its definition. Benjamin Graham, the founder of security analysis, whom Warren Buffett largely credits for his own investment success, viewed risk as the permanent impairment of capital (Graham and Dodd 1934). We will build on Graham's insight to reach a notion of risk that is relevant to long-term wealth management, including its currency-related aspects.

What makes a family wealthy is the fact that the surplus of its real and financial assets over its projected liabilities is comfortably large. In order for a family to stay wealthy, this fact must hold true at any time in the future as well. We define risk as the possibility that, because of adverse events at any time in the future, this surplus will be impaired. Our definition of risk cannot be boiled down to a single number because it spans multiple horizons, ideally extending to any arbitrary future time. Technically speaking, any

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<sup>1</sup>The concepts developed in this discussion, including the notion of customized currency baskets, except for the Global Reserve Currency Index (GRCI), have been developed and presented by Giuseppe Balocchi at a number of conferences over the years. H elie d'Hautefort is the creator of the GRCI. See also Balocchi (2008).

financial objective—such as maintaining current lifestyle, setting up a charitable foundation, or leaving an adequate inheritance—can and should be modeled as a liability, although it cannot be as clearly defined as, for example, the liability of a pension plan. Risk emerges from the unfavorable mismatch between assets and liabilities (including objectives). It is therefore necessary, in order to understand and manage risk, to assess whether such an unfavorable mismatch could happen and how to mitigate the effects of its occurrence. To carry out this exercise under only what is deemed the most probable scenario would be negligent. In fact, it is essential also to carefully consider extreme scenarios that, although unlikely, could result in a devastating impact. Although each scenario encompasses many risk factors, this discussion focuses on currency risk.

Our approach to risk is much more holistic than a narrow quantitative approach. In considering future scenarios, we draw from the lessons of economic history as well as from long-term geopolitical analysis.

## THE ECONOMIC FUNCTIONS OF MONEY

In its three main functions, money serves as a store of value, a unit of account, and a medium of payment.<sup>2</sup> First, we examine the meaning of those functions in the context of wealth management, especially considering money as a store of value; then, we elaborate on a few pitfalls in the assessment of currency risk.

### MONEY AS A STORE OF VALUE

In contrast to the transactional and thus short-term nature of its role as medium of payment, money must also serve as a store of value over time, ideally without limit. Despite the crucial importance of the function of money as a long-term store of value for wealth management, this issue attracts far less attention than it should in academic finance. Generally, it is quickly set aside by adopting the reference currency of the investor's country. In part, this tendency may be explained by the fact that many seminal finance papers were written in the United States, which accounts for a large share of the world economy—a share that was even larger when academic finance started. As a consequence, the field paid little attention to any currency other than the US dollar and assumed that correcting for US inflation was sufficient.

This state of affairs may also be related to the traditional methodology of finance, as Lo and Mueller (2010) suggest in their article “Warning: Physics Envy May Be Hazardous to Your Wealth!”: “The quantitative aspirations of economists and financial analysts have for many years been based on the belief that it should be possible to build models of

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<sup>2</sup>The functions of money were first described by William Stanley Jevons, a British economist (Jevons 1875).

economic systems—and financial markets in particular—that are as predictive as those in physics. While this perspective has led to a number of important breakthroughs in economics, ‘physics envy’ has also created a false sense of mathematical precision in some cases.” Given this framework, it is tempting to set aside any question—such as the function of money as a long-term store of value—that may be challenging to address in the context of a narrow model. Moreover, any thorough empirical work in this regard requires very long data series, extending over many decades. Ignoring what is difficult to model or address with easily available data constitutes a dangerous observational bias that was highlighted by prominent physicist Lev Landau, who warned against falling for the “streetlight effect,” whereby research is conducted where it is easiest and not where it is most relevant.<sup>3</sup>

In fact, since the 2008 financial crisis, it has become increasingly clear that the methodological foundations of finance should be revisited. The relatively narrow paradigm of finance, which is largely borrowed from the natural sciences, must give way to a broader, multidisciplinary framework in which economic history plays an important role.

The gold standard was meant to fulfill the store-of-value objective, but it was abandoned many decades ago, and its place was taken by fiat currencies, which derive their value from the mere fact that governments declare them legal tender. In this system, any student of history would find reason to worry, knowing that over the very long term, even the mightiest of empires will decline and fall. As pointed out by noted currency strategist Avinash Persaud (quoted in Suominen 2012), currencies come and go: “International currencies in the past have included the Chinese Liang and Greek drachma, coined in the fifth century B.C., the silver punch-marked coins of fourth century India, the Roman denari, the Byzantine solidus and Islamic dinar of the middle-ages, the Venetian ducato of the Renaissance, the seventeenth century Dutch guilder and of course, more recently, sterling and the dollar” (pp. 183–84).

Such changes can occur even over the space of a human lifetime, as shown by the fact that the pound sterling was still the world’s primary reserve currency in the first half of the 20th century.<sup>4</sup> Moreover, sovereign governments, particularly when laboring under huge debt burdens, may make confiscatory decisions, instead of upholding their currency as a store of value. Here, for instance, is what Dionysius of Syracuse did in the

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<sup>3</sup>The “streetlight effect” refers to an old joke: A police officer sees a drunk man searching for something under a streetlight and asks him what he is looking for. The drunk says he has lost his keys, and the two men look under the streetlight together. After a few minutes, the officer asks the drunk if he is sure he lost his keys here, and the drunk says no, he lost them in the park. The policeman asks why he is searching here, and the drunk replies, “This is where the light is.”

<sup>4</sup>For the dollar’s replacement of the pound sterling as the world’s reserve currency, see Chitu, Eichengreen, and Mehl (2014); Eichengreen and Flandreau (2009 and 2012); and Eichengreen (2011).

fourth century B.C. (Reinhart and Rogoff 2009): “Dionysius, who had borrowed from his subjects in the form of promissory notes, issued a decree that all money in circulation was to be turned over to the government, with those refusing subject to the pain of death. After he collected all the coins, he stamped each one-drachma coin with a two-drachma mark and used the proceeds to pay off his debts” (p. 174).

Successful long-term wealth management requires an awareness of the fact that, at least so far, no single fiat currency has survived the test of time. It is dangerous to confuse convenient theoretical assumptions with historical reality. In addition to relying on the reference currency, even after adjusting for inflation, as a viable store of value, a companion pitfall is accepting without question the slogan that government debt is risk free. Reinhart and Rogoff (2009) set the matter straight: “Default or restructuring of domestic public debt would significantly reduce the ‘default virgin’ list, among other things eliminating the United States from the roster of nondefaulters. For instance, the abrogation of the gold clause in the United States in 1933, which meant that public debts would be repaid in fiat currency rather than gold, constitutes a restructuring of nearly all the government’s domestic debt” (p. 44). In fact, the heightened macroeconomic uncertainty arising from the 2008 financial crisis, the unprecedented monetary policy measures undertaken since, and the repeated talk of currency wars (see Rickards 2011) provide ample reason to doubt the future of any given currency. Again, the issue is not what is the most probable scenario but whether the family wealth could be significantly impaired in real terms under a pessimistic but hardly impossible scenario.

Let us consider as an illustration the objective of maintaining an affluent lifestyle, which is a typical objective of people with wealth. Broadly speaking, industrialization and globalization have led to a market decrease in the price of basic necessities, as shown by the fact that the percentage of income spent on food and clothing has declined significantly over the past century. Conversely, the price of premium personal services, for which there are no economies of scale or productivity gains from technology, has gone up enormously in the same period. The same can be said of luxury goods because of their scarcity value. It is also well known that the cost of education at the world’s top universities or health care in the best facilities has increased much faster than inflation. In 1976, *Forbes* created the Cost of Living Extremely Well Index (CLEWI), which is based on a selection of 40 luxury goods and services. This index has outpaced the US Consumer Price Index by 2.40% a year (expressed in US dollars with geometric compounding), reaching a level 2.25 times that of the latter index in just 34 years. This example shows that the US dollar, even after correcting for inflation with the Consumer Price Index, is a poor store of value over the medium or long term when measured against the objective of maintaining a wealthy lifestyle.

Moreover, it is possible that the US dollar will become an even poorer store of value for wealthy families as the development of emerging market countries creates more demand for scarce luxury goods and the world population ages, possibly increasing the cost of personal services.

### **MONEY AS A UNIT OF ACCOUNT**

Money serves also as a unit of account, thereby allowing the measurement of wealth. Any currency can in principle be used for this purpose, even for a global portfolio, provided that exchange rates are available. However, if a currency that is not an optimal store of value is used as a unit of account, the nominal measurement that is derived must be corrected downward to reflect the depreciation of that currency in real terms. This issue is not as trivial as it might appear, as optical illusions, possibly leading to distortions in the investment decision-making process, may be caused by the difficulty of accounting in both nominal and real terms. It is therefore essential to measure wealth and investment performance with a suitable unit of account that will serve as a reliable store of value over the long term.

### **MONEY AS A MEDIUM OF PAYMENT**

The function of money as a medium of payment leads us to ponder how bank payments are settled. In the correspondent banking system, which has been the norm since at least the Medici Bank in the Renaissance, such payments ultimately transit through bank accounts in the country that issues the currency in which the payment is denominated. This system gives authorities in that country the ability to control or block any such transfer. This point was not lost on Robert Morgenthau, Manhattan's former district attorney, who allegedly stated that the fact that nearly all of the US dollar payments worldwide settled in his district conferred on him *de facto* authority over all financial institutions using the dollar, even if they had no US presence. Morgenthau showed the way for a number of subsequent extraterritorial prosecutions, including the case that led to the downfall of Wegelin & Company, the oldest private bank in Switzerland. In fact, US authorities have shown virtually no restraint in threatening to deny or actually denying access to the US dollar settlement system as a political sanction (e.g., for residents in Iran) or as leverage to extract large fines from financial institutions. The large fine recently imposed on BNP Paribas is a telling case in point. In fact, such an episode may trigger a "boomerang effect" against the US dollar as non-US institutions become weary of the legal and compliance risks involved in using the greenback as a medium of payment. As the *Economist* ("Dominant and Dangerous" 2015) puts it, "America increasingly uses its financial clout as a political tool. Policymakers and prosecutors use the dollar payment system to assert control not just over wayward bankers

and dodgy football officials, but also errant regimes like Russia and Iran. Rival powers bridle at this vulnerability to American foreign policy.”

Any prudent organization or wealthy family would thus be well advised not to rely on a single currency, especially the US dollar, as the sole means of payment. This recommendation may seem far-fetched. Admittedly, the probability of access denial may be very small, although it is higher for residents of countries that have, or may develop, poor relations with the United States. One could lose access to the US dollar payment system for political reasons, despite being in full compliance with all applicable laws and regulations. It might be enough to hail from what is considered the wrong country at a given point in time, which could happen to anybody, owing to changing political realities. In addition, judicial recourse against such political decisions may be limited in case of sanctions. The impact of losing access to the US dollar payment system is devastating. It is therefore reasonable to conclude, as any risk manager knows, that this low-probability but very high-impact risk must be mitigated with currency diversification.

Along the same lines, the idea that the imposition of capital controls might disrupt the ability to make use of one’s own assets seems unrealistic, especially in the United States and Europe. It should not be forgotten, however, that capital controls were the rule rather than the exception in many Western countries well into the 1970s.<sup>5</sup> They were abandoned when the political consensus shifted toward a more favorable view of financial markets. Now, however, the pendulum is swinging in the other direction, with capital markets fragmenting along the boundaries of economic blocks as a result of differences in regulations and, arguably, mistrust among regulatory authorities.

It is worth noting that the recent emergence of cryptocurrencies, such as bitcoin, may be partly motivated not only by the desire to use a medium of payment outside of direct government control but also by a mistrust of fiat currencies, particularly in countries suffering under very difficult macroeconomic conditions. The fact that the world is becoming increasingly digital may further boost cryptocurrencies. In fact, blockchain (Nakamoto 2008), the public ledger system that underpins bitcoin, has the potential of transforming finance above and beyond payment methods.

## PITFALLS IN ASSESSING CURRENCY RISK

When it comes to currencies, unfortunately, many investors stumble into pitfalls that can be damaging to their wealth over the long term. Although we are not aware of any pertinent study of currency decisions, our experience shows that the biases of short-termism, overconfidence, and functional fixation are both common and damaging to financial health.

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<sup>5</sup>They have also been recently introduced in crisis-stricken eurozone countries, such as Cyprus and Greece.

Short-termism leads investors to consume nearly the entire budget of intellectual energy and time they have allocated to currencies in an attempt to forecast currency moves over the immediate future. However, even active currency overlay managers claim only a limited ability to forecast currency moves; they do their best to exploit marginal pockets of predictability with fine-tuned trading strategies while employing careful risk management. Indeed, if one can forecast currency direction correctly 51% of the time (whereas a mere coin toss should have a 50% accuracy rate), this ability can be exploited, at least in principle, to generate significant economic profits. Anybody who has constructed and back tested currency-forecasting models knows that achieving 51% directional forecasting accuracy with statistical significance is no mean feat (see, for instance, Balocchi 1998). However, such a profit-generating forecasting model is still wrong 49% of the time. For that reason—and because of the concepts outlined previously in the section on risk—it would constitute professional malpractice to use such a model as the sole basis of currency risk management.

Nonetheless, overconfidence, together with the all-too-human taste for well-told stories (which we term narrativity bias), often leads decision makers, including investment committees, to set aside the obvious inherent limitations of the available information set. This mistake results in mismanagement of currency risk. Currency risk management should rest on careful evaluation of the currency exposure of assets, liabilities, and financial objectives rather than on the attempt to predict short-term currency moves.

The functional fixation hypothesis is a concept borrowed from psychology (Ijiri, Jaedicke, and Knight 1966) and describes the situation in which decision makers are fooled by the accounting presentation and do not restate it to represent the true economic performance. This hypothesis has been the subject of research in the domain of equities, but to our knowledge, it has not been applied to currencies. Although a formal test of this hypothesis is beyond the scope of this brief, we have seen functional fixation at work many times in the domain of currencies, with investors failing to fully appreciate the impact of currency moves on their returns. Even more damaging to long-term wealth preservation is the fixation on measuring wealth in nominal terms in any given currency, without appreciating the complex problem of the function of money as a long-term store of value and the related question of its being a unit of account that should be stable in time. Our conclusion is that functional fixation impairs decision making in the currency domain. We hope that this discussion will contribute to dissipating this dangerous cognitive bias by showing how wealth can be preserved in real terms for generations to come.

# THE IMPACT OF THE SHIFT TO A MULTIPOLAR WORLD

Geopolitical factors are important in shaping the financial landscape. Financial assets ultimately are claims on future cash flows, and the enforcement of these claims depends on the prevailing legal framework. Economic history provides a number of examples of how financial claims have been impaired by government action, including confiscatory taxation and the imposition of capital controls. And the impact of geopolitical factors is likely to increase. The recent financial crisis probably marked the turning point from a political environment with a generally laissez-faire attitude toward financial markets to one with the will to impose prescriptive regulation. Moreover, because authorities have taken different approaches in each country, access to financial products and services is becoming more segmented by national boundaries, reversing the trend toward the globalization of financial services. Another cause of the rising importance of geopolitical factors is the markedly increased role played by central banks, with their unprecedented impact on financial intermediation and with balance sheets that represent a significant portion of their countries' gross national product (GNP).

Even more important, the financial crisis was a milestone in the accelerating trend toward a multipolar, or (arguably) apolar, world and away from the political dominance of the United States. The economic balance of power is gradually shifting toward China and a number of emerging market economies. It is also worth noting that the entrenched economic powers—the United States, Western Europe, and Japan—have accumulated a level of debt that is unprecedented (at least in peacetime). This debt creates a motivation, amounting to a moral hazard, to push interest rates as low as possible, to keep the cost of servicing the debt bearable, and even to whittle the debt down with inflation. This is the essence of the environment of financial repression that now prevails in developed countries. The result is a transfer of wealth from those holding savings and investments in fixed-income securities to debtors, including, first and foremost, the public sector.

Emerging market countries, conscious of their rising economic importance, increasingly chafe at a financial system that was set up when they were far less relevant and that is reluctant to allow them the place they feel they rightfully deserve. In this context, it is important to note the recent milestones accomplished by the BRIC (Brazil, Russia, India, and China) countries in establishing their own multilateral development bank and by China in pioneering the Asian Infrastructure Investment Bank, which was joined by all the G-7 countries, except Japan and the United States.

The establishment of these banks could constitute an inflection point, leading to a progressive loss of influence for the Bretton Woods institutions, especially if the demands for adequate representation by the BRIC countries are not answered to their satisfaction. The inclusion of the renminbi (as of 1 October 2016) in the basket of key international currencies that is the basis for the special drawing rights (SDRs) of the International Monetary Fund fulfilled an important objective of China's policy. In fact, if requests from China for adequate representation in the existing international financial framework, including the Bretton Woods institutions, are not accepted, China could be tempted to sponsor alternatives to these institutions, thereby leading to a de facto fragmentation of the global financial system. It is also worth noting that the proportion of investable assets to GNP is much larger in developed countries than in developing countries. In consequence, virtually any asset allocation results in excessively overweighting developed countries and underweighting developing countries in terms of GNP.

These matters are likely to have far-reaching consequences in the world of currencies as well. The US dollar is still the dominant reserve and trade currency, but its stronghold is under threat. As the *Economist* puts it, "As America's economic supremacy fades, the primacy of the dollar looks unsustainable" ("Dominant and Dangerous" 2015).

In an apolar world, a number of currencies may coexist without a clearly dominant currency emerging. For the purposes of this discussion, we do not need to prove that the scenario in which the US dollar loses its reserve status is likely or that it will happen in the foreseeable future. The mere possibility of such a scenario should be a powerful call to action if we are diligent about managing currency risk.

## THE UNIQUE CURRENCY MANAGEMENT DILEMMA FACED BY FAMILY OFFICES

Let us briefly summarize the challenges that the external environment poses to the management of currency risk.

1. Any single fiat currency is unlikely to serve as a reliable store of value under all possible future scenarios because the cost of maintaining a wealthy lifestyle increases faster than inflation.
2. There is an imbalance between world GDP, in which such developing countries as China play an increasing role, and the universe of investable assets, which is concentrated in developed countries. In addition, developed countries are currently suffering under unprecedented government debt and a degree of financial repression.

3. There are possible future scenarios in which access to the US dollar payment system could be restricted or denied because of political reasons.

Factors that are inherent to wealthy families include the following.

1. Wealthy families have a mission to preserve wealth in terms of real purchasing power for future generations.
2. Wealthy families continue to become more global in their outlook, revenues, expenses, and financial objectives.
3. The liabilities of a wealthy family, which consist mainly of financial objectives, cannot be defined with the same precision as, for example, those of a pension fund. In fact, although these liabilities or objectives can be assessed, they generally cannot be quantified as a precise cash flow in any given currency.

Given their global footprint and diverse income and expense streams, wealthy families face increased complexity when it comes to currency decisions. The impact of currency mismatches in the management of assets and liabilities (objectives) can be very damaging, especially over the long run. The interplay between external challenges and the fact that liabilities cannot be modeled with any degree of certainty, as mentioned previously, makes the problem quite daunting. This explains why the issue of currency risk is not usually tackled, at least not with the required holistic, long-term perspective that we advocate here. The problem of managing currency risk for wealthy families in the presence of uncertain cash flows has been investigated by Klement and Longchamp (2010), who also study the case of currency exposure in multiple currencies. They provide robust empirical results showing the superiority of consumption-weighted currency allocation to market weighting or fundamental (GDP) weighting.

## WHY THE NOTION OF A SINGLE REFERENCE CURRENCY IS INADEQUATE

The standard best-practice method of dealing with currency risk proceeds as follows.

1. The reference currency is defined.
2. Currency risks arising from assets (and liabilities) exposed to other currencies are identified.
3. A currency-hedging strategy is designed.

We have already argued that for wealthy families with a global footprint, it is almost always impossible to define a single meaningful reference currency. This is because, as indicated previously, liabilities and objectives cannot be quantified as a precise cash flow in any given currency. Such liabilities and objectives may be contingent on future decisions that are influenced by the world's economic and geopolitical evolution.

Let us consider the case of a wealthy family that chooses its home country's currency as the reference, fully hedging its currency risk arising from assets and liabilities in currencies other than the reference currency. Let us suppose now that this reference currency crashes. Even if the family in question enjoys a remarkable investment return in terms of its reference currency, the crash will leave it considerably poorer in global terms. We do not believe that this is a satisfactory or even acceptable outcome, and yet it follows from the literal application of the single-reference-currency concept.

We have seen wealth managers receive blame and lose mandates as a result of what was not even a crash but merely a material depreciation of the reference currency. We have also seen the disbelief on the part of these wealth managers, who don't understand how a client could be unhappy enough to fire them when they simply managed by the book, generating a reasonable risk-adjusted return in the chosen reference currency. In one such episode, a wealth manager, reflecting on his misfortune, blamed the client's financial illiteracy. Our assessment, however, is quite the opposite. In Einstein's words, "Everything should be made as simple as possible, but not simpler." The choice of a single reference currency makes the subject of currency risk simpler than reality, sweeping real financial risk under the rug, with possible severe, adverse long-term consequences for the financial health of the family. Needless to say, when such risk materializes—and in the long term, it is likely that it will—any financial advisers who oversimplified the currency risk problem will find themselves in a very difficult position. By the way, this argument applies not only to the case of wealthy families but also to any context in which liabilities and financial objectives are not absolutely restricted to the chosen reference currency or so well defined that they can be hedged without uncertainty into the reference currency.

The effects of globalization are clearly visible in today's economic environment, in which prices—for commodities, houses in international cities (financial centers in particular), international investments, and the energy consumed by families and businesses—are heavily dependent on the movements of world currencies and the development of global economies relative to a given local economy.

It is interesting to examine the shifting composition of foreign buyers of New York City residential real estate. For example, during the 1980s, buyers were mostly from Japan, and then, in the 1990s, they were from the Middle East and Russia. When Israel lifted its ban on its citizens buying property overseas, purchases by Israelis surged at the end

of the 20th century. In the mid-2000s, a boom in Ireland's economy sent buyers from Dublin to New York City, and a few years ago, a flurry of European buyers made the most of a strong euro. Thus, the competition for prime real estate is very strong, and the price one pays for a home in one's own country may be driven up by investors with stronger currencies relative to the US dollar. This example underscores the need for global family businesses to find an alternative to the traditional approach and measure wealth and assets in something other than the home currency.

Another example of this issue is the pegging of the wealthy Gulf nations' currencies to the US dollar. This policy was originally implemented to stabilize these countries' oil revenue, which is traded in US dollars. In the meantime, however, US monetary policy, with its low interest rates, is stoking inflation in oil-producing countries. Sentiment is growing in favor of removing the peg or at least allowing the oil currencies to drift gradually higher, as China did with the renminbi in 2005.

### WHAT CAN WE LEARN FROM CENTRAL BANKS' RESERVE MANAGEMENT?

Central banks and other monetary authorities must hold assets to back their liabilities, including the local currency they issue and the deposits they hold on behalf of commercial banks. Although the context of a central bank, including policy objectives and governance considerations, is different from that of a family office, several common considerations apply. Liquidity is arguably more important for central banks, which may need to use reserves to carry out foreign exchange operations.<sup>6</sup>

Central banks have long been advocates of reserve diversification, and recently, many have worked hard to distribute their reserves away from any single currency in order to dampen the adverse effects of any major currency movements. By building up a diversified reserve allocation, a central bank can better protect purchasing power and diminish the effects of inflation in its own country. It is also worth noting that both the Bank for International Settlements and the International Monetary Fund establish their financial statements in SDRs, which are, in fact, a basket of currencies.<sup>7</sup>

Central banks also hold gold. For hundreds of years, gold has been seen as a stable reference point, given its favorable characteristics as a long-term store of value. At present, gold makes up more than 10% of global central bank reserves. Over time, the purchasing power of fiat currencies has weakened significantly, while gold has retained its power in terms of the goods and services it can buy. It is remarkable, for example,

<sup>6</sup>For central banks, Gintschel and Scherer (2004) advocate a dual benchmark optimization approach for wealth and liquidity preservation.

<sup>7</sup>See [www.bis.org](http://www.bis.org) and [www.imf.org](http://www.imf.org).

that military pay in the ancient Roman army and in the modern US Army are relatively similar when expressed in gold (Erb and Harvey 2013). Gold also acts as a stabilizer within a portfolio, protecting against widespread defaults and volatile currency markets and offering low correlation to other traditional asset classes.

## THE PROPOSED SOLUTION: A GLOBAL CURRENCY BASKET

We have argued that a single reference currency does not make sense for a wealthy family because it is unlikely to serve as a reliable store of value over the long term and thus constitutes a misleading unit of account as well. In extreme cases, it may also fail to function as a medium of exchange for international payments if the family is shut out of the payment system of the country issuing the reference currency.

If the currency exposure of liabilities and objectives is known, the optimal reference would be a currency basket with weights corresponding to those liabilities and objectives. In the rather unlikely case that liabilities and objectives are confined to a single currency, that would be the reference currency. However, the issue of that currency's ability to serve as a reasonably long store of value would remain and would need to be addressed.

In many cases, however, the currency exposure of financial objectives may not be known. The globally mobile wealthy family may want to preserve its global purchasing power. For that scenario, we have designed a solution—a proxy for the “world currency.” We have implemented the Global Reserve Currency Index (GRCI),<sup>8</sup> which has weights based on GDP for each country, adjusted for purchasing power parity (PPP). We call it a “reserve currency index” because it is akin to central bank reserves. In fact, in addition to gold, central banks and other monetary authorities hold foreign-exchange reserves, mostly in US dollars but also in other currencies, such as the euro, pound sterling, and yen (IMF 2012). The weight of a currency in the GRCI increases or decreases with that currency's role in the global economy, as measured by PPP-adjusted GDP. The index thus captures the impacts of geopolitical trends and of shifts in economic power toward emerging market countries. It is worth noting, for example, that the weight of the Chinese renminbi in the GRCI more or less doubled in the last decade as China's importance in the global economy increased. The GRCI also holds

<sup>8</sup>Currency basket indexes have been proposed recently by other authors. To our knowledge, the GRCI, introduced in 2009, was the first. The GRCI was developed in response to investor demand for an independent and objective store of global wealth, capable of withstanding currency turmoil and depreciation. It is also used as the reference for recently launched Globcoin<sup>®</sup> multi-currency accounts. Reserve Currency Solutions owns the intellectual property underpinning the GRCI and produces and maintains the index.

gold, with a fixed 5% weight, which is a rough estimate of the average gold allocation in central bank reserves.

Emerging currencies, in addition to enjoying better fundamentals—because their countries generally have lower public debt levels than the G-7 countries—offer more attractive yields, which are captured by the GRCI. We mitigate the impact of financial repression, which reduces interest rates for the currencies of developed (and very indebted) countries, by benefiting from the better yields offered by developing countries. We also correct the bias inherent in the allocation to a typical investment benchmark. By and large, the universe of investable assets is concentrated in developed countries, which over the long term, almost by definition, are likely to grow less than developing countries. Thus, any traditional allocation is short growth. By using the GRCI as the reference currency basket, we essentially remove this low-growth bias.

Interestingly enough, we have encountered sophisticated family offices that practice currency diversification with currency baskets but appear to do so by selecting assets in the currencies of their choice. Adopting our currency basket index, especially when implemented through a currency overlay approach, offers two important advantages:

1. Asset allocation decisions can be made independently of the chosen currency basket because the currency exposure is achieved through the overlay and not through asset allocation.
2. Currency allocation becomes more disciplined and systematic.

## THE ASSET MANAGEMENT IMPLICATIONS OF ADOPTING A CURRENCY BASKET AS THE REFERENCE CURRENCY

Although such a demonstration is outside the scope of this discussion, the practical implementation of a currency basket within a given portfolio can be achieved with hardly any disruption to existing asset allocation and with very limited costs. Tried-and-tested currency overlay techniques can be used. When a currency overlay mandate cannot be considered, exposure to the GRCI can still be achieved through other means.

The fundamental challenge, however, is conceptual. The GRCI (or any similarly constructed basket) should not be viewed as a tactical play that requires the monitoring of its short-term performance with respect to the US dollar, or any other currency. In fact, the currency basket corresponding to the liabilities and objectives should become the ultimate unit of account against which asset returns are measured. This is exactly what a few multilateral financial institutions do, including the International Monetary Fund and the Bank for International Settlements, which perform their accounting in SDRs.

We understand, however, that this scenario represents a radical change, albeit one with excellent justifications. Apart from the cognitive step that is required in undertaking such a change, there are practical difficulties, starting with the fact that custodian banks typically do not have accounting systems that enable such a choice. However, this obstacle may be overcome, because wealthy families in many cases hold their assets with a number of different banks and financial institutions, using a separate, nonbank provider to establish consolidated reports.

## EMPIRICAL WORK AND FURTHER RESEARCH

To our knowledge, there has been remarkably little research on the essential function of money as a store of value. We intend to pursue further work in this area, which is fundamental to long-term wealth management. We also hope that our contribution stimulates future research. Academic finance relies on both formal mathematical theories and empirical work. Both approaches can shed light on the subject, albeit with a number of limitations. Our work questions some implicit and explicit assumptions of established theories. It should be noted, however, that the recent financial crisis has swept away quite a bit of dogmatism.

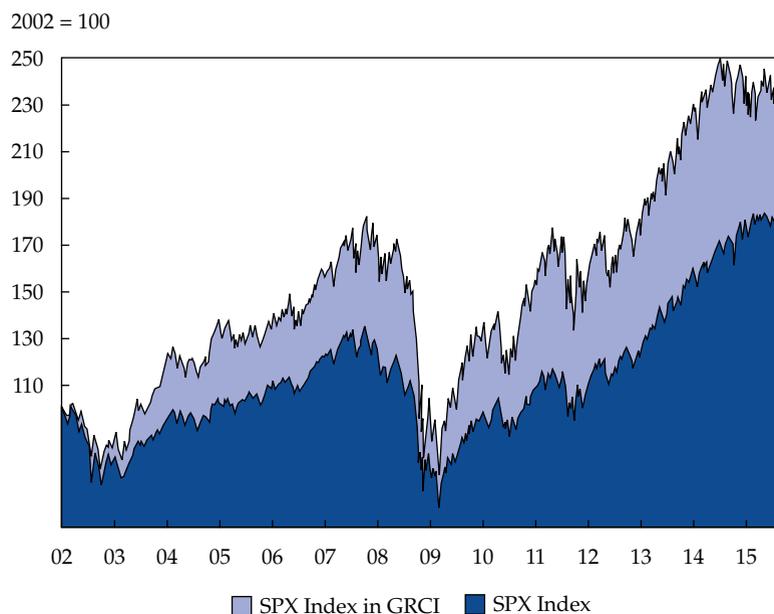
Empirical work relies on representative data samples. Although the past is not necessarily a guide to the future, it is interesting to assess the GRCI's historical performance. **Figure 1** shows that for an investment in the S&P 500 Index over the 13 years ending with 2015, hedging it into the GRCI results in outperformance of nearly 45%, reflecting the outperformance of the GRCI with respect to the US dollar over the same period.<sup>9</sup>

We would like to stress, however, that our case for adopting a diversified currency basket does not rest on historical performance, because a short period of a decade or more does not fully address the issue of long-term performance as a suitable store of value. Also, it is quite possible that the GRCI may underperform, with respect to the US dollar, in the short or even the medium term when the US dollar appreciates. Looking at the question from a tactical point of view is inappropriate and misguided in light of the issues we considered at the beginning of this discussion regarding the economic function of money.

With a forward-looking approach, we can construct a few representative scenarios and look at the impact of allocating wealth to the GRCI. Among the scenarios that could

<sup>9</sup>The performance hedged into the GRCI is calculated daily as the sum of the performance of the S&P 500 and of the GRCI itself, both expressed in US dollars. It corresponds to an investment in the S&P 500 together with a foreign exchange overlay into the GRCI (short the US dollar and long the GRCI) for the full amount invested into the S&P 500.

**FIGURE 1. COMPARISON OF THE PERFORMANCE OF THE S&P 500 INDEX IN US DOLLARS AND ITS PERFORMANCE HEDGED INTO THE GRCI**



Source: OptimInvest.

be considered are a rapid US dollar depreciation/appreciation, stagflation in the developed world, and currency wars. This is a subject for our ongoing research.

## CONCLUSIONS AND RECOMMENDATIONS

To successfully manage wealth over the long term, we need to think deeply about the economic function of money, particularly as a store of value but also as a medium of payment and a unit of account. We also need to adopt a more holistic approach to risk, heeding the lessons of economic history: No currency, in particular no fiat currency, has survived the test of time over the very long term. Risk must be managed not only under what appears to be the most likely scenario but also under extreme scenarios. We must overcome the cognitive biases of short-termism, overconfidence, and functional fixation and follow the practices of central banks in the diversification of currency risk.

## OVERCOMING THE NOTION OF A SINGLE REFERENCE CURRENCY

With wealthy families becoming more and more global and the world becoming multipolar (or apolar), the notion of a single reference currency is too simplistic. Sticking to it means failing to manage currency risk and potentially incurring adverse long-term outcomes. The solution is a diversified currency basket, with weights corresponding to the currency composition of liabilities and financial objectives. Each family must decide how best to manage its wealth and its own diversification plans. A one-size-fits-all approach cannot succeed because every family has its own individual exposures, revenues, and expenses spread out to every corner of the globe. Because the currency composition of a globally mobile family's long-term financial objectives is often not known, we should think in global rather than local terms, moving away from a single base currency to something more indicative of how global economic power is shifting.

Neglecting currency risk, or dealing with it through approaches that are too simplistic, can be seriously damaging to financial health. Our simple proxy for the world currency, the GRCI, can play a very useful role in the management of currency risk for global wealthy families. Its implementation, especially when conducted with currency overlay techniques, causes hardly any disruption to the existing asset allocation process.

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*Reserve Currency Solutions (RCS) owns the intellectual property underpinning the GRCI and produces and maintains the index. OptimInvest is an asset manager that is regulated in Switzerland and has an exclusive agreement with RCS to manage products based on the GRCI.*

# REFERENCES

- Balocchi, G. 1998. “Die statistische Evaluation von Finanzmarktprognosen.” In *Aktives Portfoliomanagement: Der Anlageentscheidungsprozess von der Prognose bis zum Portfolio*. Edited by C. Kutscher and G. Schwarz. Zurich: Verlag Neue Zürcher Zeitung.
- Balocchi, G. 2008. “Crisis and Hubris: Thinking Through the Origins of the Current Financial Crisis.” *Performance Measurement and Client Reporting Review*, vol. 1.3 (Spring): 14–21.
- Chitu, L., B. Eichengreen, and A. Mehl. 2014. “When Did the Dollar Overtake Sterling as the Leading International Currency? Evidence from the Bond Markets.” *Journal of Development Economics*, vol. 111, November: 225–245.
- Economist*. “Dominant and Dangerous.” 2015. *Economist* (3 October): [www.economist.com/news/leaders/21669875-americas-economic-supremacy-fades-primacy-dollar-looks-unsustainable-dominant-and](http://www.economist.com/news/leaders/21669875-americas-economic-supremacy-fades-primacy-dollar-looks-unsustainable-dominant-and).
- Eichengreen, B. 2011. *Exorbitant Privilege: The Rise and Fall of the Dollar and the Future of the International Monetary System*. New York: Oxford University Press.
- Eichengreen, B., and M. Flandreau. 2009. “The Rise and Fall of the Dollar (or When Did the Dollar Replace Sterling as the Leading Reserve Currency?)” *European Review of Economic History*, vol. 13, no. 3 (December): 377–411.
- Eichengreen, B., and M. Flandreau. 2012. “The Federal Reserve, the Bank of England, and the Rise of the Dollar as an International Currency, 1914–1939.” *Open Economies Review*, vol. 23, no. 1 (February): 57–87.
- Erb, C.B., and C.R. Harvey. 2013. “The Golden Dilemma.” *Financial Analysts Journal*, vol. 69, no. 4 (July/August): 10–42.
- Gintschel, R., and B. Scherer. 2004. “Currency Reserve Management by Dual Benchmark Optimisation.” In *Risk Management for Central Bank Foreign Reserves*. Edited by C. Bernadell, P. Cardon, J. Coche, F.X. Diebold, and S. Manganelli. Frankfurt am Main: European Central Bank.
- Graham, B., and D.L. Dodd. 1934. *Security Analysis*. New York: Whittlesey House.
- Ijiri, Y., R.K. Jaedicke, and K.E. Knight. 1966. “The Effects of Accounting Alternatives on Management Decisions.” In *Research in Accounting Measurement*. Edited by R.K. Jaedicke, Y. Ijiri, and O. Nielsen. New York: American Accounting Association.

IMF. 2012. "Currency Composition of Official Foreign Exchange Reserves (COFER)." International Monetary Fund ([www.imf.org/external/np/sta/cofer/eng/index.htm](http://www.imf.org/external/np/sta/cofer/eng/index.htm); retrieved 3 January 2013).

Jevons, William Stanley. 1875. *Money and the Mechanism of Exchange*. New York: D. Appleton.

Klement, J., and Y. Longchamp. 2010. "Managing Currency Risks for Global Families." *Journal of Wealth Management*, vol. 13, no. 2 (Fall): 76–87.

Lo, A., and M. Mueller. 2010. "Warning: Physics Envy May Be Hazardous to Your Wealth!" Working paper (12 March).

Nakamoto, Satoshi. 2008. "Bitcoin: A Peer-to-Peer Electronic Cash System." Working paper (<https://bitcoin.org/bitcoin.pdf>).

Reinhart, C., and K. Rogoff. 2009. *This Time Is Different: Eight Centuries of Financial Folly*. Princeton, NJ: Princeton University Press.

Rickards, J. 2011. *Currency Wars: The Making of the Next Global Crisis*. New York: Penguin Group.

Suominen, K. 2012. *Peerless and Periled: The Paradox of American Leadership in the World Economic Order*. Stanford, CA: Stanford University Press.

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