

Currency turmoil in an unbalanced world economy

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Summary

The world is once again under threat of currency turmoil ignited by a vigorous appreciation of the dollar against all other currencies. This is the harbinger of another long cycle which has been the pattern of exchange rates since the fall of the Bretton Woods system in 1971. Because dollar cycles are driven by momentum dynamics disconnected from fundamentals, they are likely to distort real effective exchange rates between major currencies. The dollar appreciation phase may also wreak havoc in the financial systems of emerging countries that are heavily indebted in dollars.

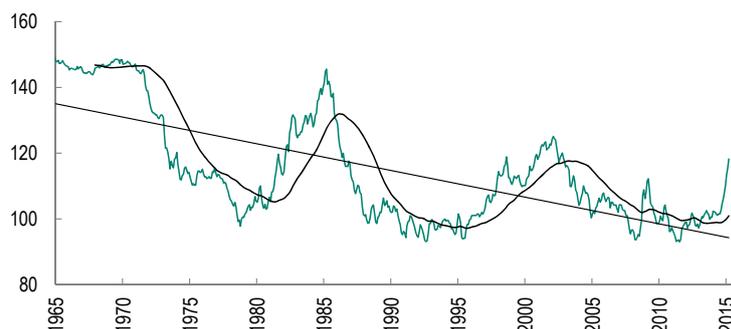
In the present state of the world economy, the prospect of a new dollar cycle is particularly worrisome since most countries, far from deleveraging after the financial crisis, have massively increased their debt relative to GDP in the non-financial sectors. The rise in dollar debt is due to subpar income growth in the world economy which has precluded deleveraging of the already high level of debt reached in 2007 on the one hand, and to the status of the dollar as the de facto exclusive supplier of international liquidity on the other hand. Because US monetary policy is not bound by any international rules, it has supplied liquidity on its own terms, flooding the world with cheap money in order to revive domestic consumption in the US.

The catalyst for renewed dollar appreciation has been the divergence in monetary policy between the US on the one side, Japan until early 2013, and the euro area until late 2014 on the other. Monetary policies in these latter countries, working counter to the US before a recent change in course, have created deflation risks that the new trend of dollar appreciation compounded with the slump in the price of oil is expected to correct, spreading the recovery worldwide.

However, this is the benign scenario. History would suggest the possibility of a much more unpleasant outcome. Misalignment in exchange rates is a repeated feature of dollar cycles, as much as unsustainable imbalances in the balance of payments. Currently, the gap between US long term interest rates and similar rates in the euro area and Japan is large and expected to widen. Nevertheless, the market's expectations of future short-term interest rates up to end-2017 are much lower than the Fed's. If the market expectations are right, this means that the US recovery will be hurt by the dollar turning from being cheap to expensive. If the US recovery stalls, this will mean that secular stagnation will be with us for an indefinite time.



The dollar cycle, real effective exchange rate of the USD and trend



Source: BIS.

1 Introduction

The dollar has soared against the yen since early 2013, and against the euro since mid-2014, (Figure 1). Up to March 2015 the prospects looked fine. With the US economy being relatively buoyant with good employment statistics, and the euro area still in the doldrums, it seemed possible that the exchange rate mechanism might succeed, helped by market anticipations of diverging monetary policies, for example, incipient rise of Fed funds rate in the US, and massive quantitative easing (QE) cum zero to negative interest rates in the euro area.

As has happened before in similar circumstances, the US authorities were optimistic. Treasury secretary Jack Lew declared: "Let the exchange rate go where it needs to go"! However, no one, at any time, has been able to figure out where the exchange rate needs to go. Past experience does not support such an upbeat view beyond the short run. Since the beginning of the era of the floating exchange rate, the dollar has exhibited huge medium-term cycles with no hint of the existence of a fundamental value that might be a stabilizing attractor for the FX system.

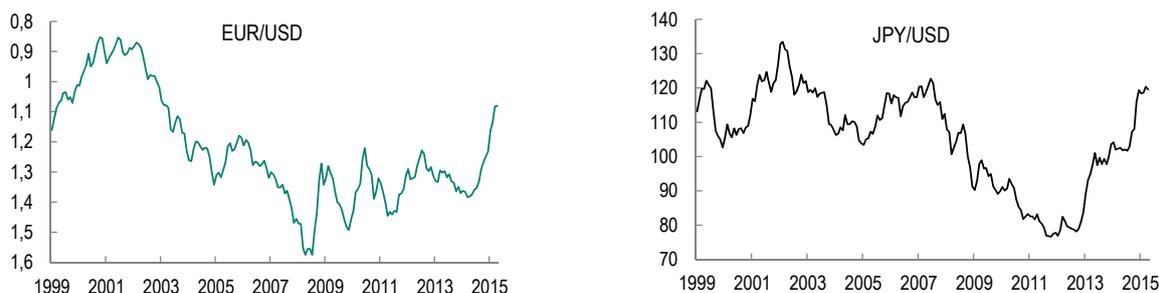
Therefore, the questions that arise are: Is the dollar in the early phase of another momentous appreciation? What would be the consequences for the unbalanced world economy? Can US growth drive up growth in the rest of the world, or will distorted exchange rates reengineer the growth of global imbalances and reignite financial vulnerabilities?

The latest figures have made Fed officials more cautious. In March 2015 exports rose less than 1% while imports grew 7.7% based on huge increases in imports of consumer goods, resulting in a jump in the trade deficit of 40% since February. New York Fed economists estimate that the dollar appreciation already achieved might reduce GDP growth by about 0.6% in 2015. Those estimates are not forecasts. US output might bounce back if consumer demand remains strong. However, what seems more likely than previously thought is a financial environment with higher volatility of exchange rates and asset prices, which may complicate monetary policy.

2 Higher indebtedness and lower growth in the world economy

Textbooks in international monetary economics describe price adjustments through exchange rate changes as responses to exogenous shocks that have generated temporary discrepancies from an intertemporal world equilibrium. It is assumed that all rational agents engaged in international business perfectly know this equilibrium and expect mean-reverting forces to restore it. Three assumptions must hold for an efficient price adjustment mechanism: deficits and surpluses in equilibrium stem from structural differences in saving and investment behaviors across countries; assets have fundamental values known to financial investors who correctly estimate future yields and risks;

Figure 1 – Nominal exchange rate of the dollar against the euro and the yen



Source: OCDE.

exchange rate adjustments hamper cumulative divergences from the shocks.

Those theoretical models depict a perfectly integrated world economy, where financial integration is supposed to allocate world saving optimally, so that the deeper their financial integration, the better the welfare of countries.

This normative framework is far removed from the historical process of financial globalization, and is utterly misleading. Dany Rodrik and Arvind Subramanian (2009) show empirically based on a large panel of countries, that international financial opening had no positive impact on long-run growth. More recent studies at the BIS by Cecchetti and Kharroubi (2012, 2015) also provide evidence that financial development can have a negative impact on aggregate productivity growth. After controlling for a set of macroeconomic variables, their main finding is an inverted U-shaped curve (a parabolic relationship) between different measures of the debt to GDP ratios, and 5-year average GDP growth per worker. Starting with closed countries, financial development is beneficial for growth up to a point after which it becomes detrimental to growth; advanced economies have long passed the optimal level of indebtedness.

...financial development is beneficial for growth up to a point...

2.1 High global indebtedness: a drag on growth

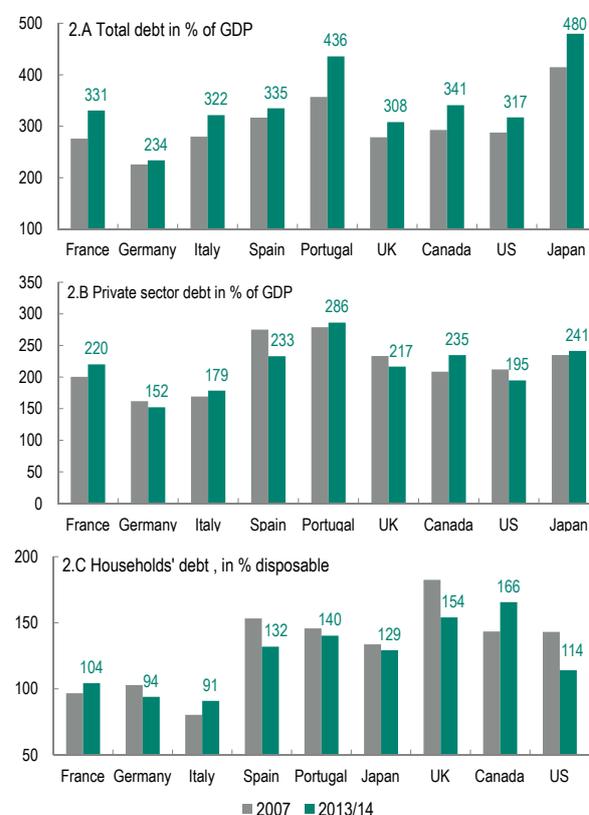
Let us introduce the dilemma. High indebtedness is a drag on growth. Nonetheless, as median wage growth has fallen below productivity gains, rising indebtedness has become the main driver of global demand, fueling the benefits of financial intermediaries. In these circumstances, any attempt to deleverage lowers the real return on capital by stifling productive investment, while accumulating liquidity in search of yield. As long as the logic of integrated finance pervades, the country issuing international liquidity bears a lower risk after a financial crisis. Under the umbrella of the key currency status of the dollar, the US has been able to run monetary and fiscal policies to transfer debts on a massive scale from the private to the public sector. US households have had the opportunity to deleverage sufficiently to resume spending. However, since global indebtedness has increased massively worldwide since 2007, it is questionable whether the dollar will appreciate enough to drive the rest of the world out of its debt overhang through export expansion, without jeopardizing the US's own recovery. Should such a configuration emerge, as it has done in the past, a currency war might ensue that would call for a minimal understanding in the G20.

The debt to GDP ratio at the global level has not receded since 2007, and in fact has even continued to increase, gaining 17% from end-2007 to Q2 2014, and this on top of the 23% rise in the seven years prior to the crisis according to Mac Kinsey (2015). This phenomenon has been observed in nearly all countries, whether developed, emerging, or developing. The rise in total debt to GDP is depicted on Figure 2.A for several major

advanced countries. All the selected countries - the US, the UK, Japan and the main euro area members - show a sharp rise in their total debt ratio since the 2007 crisis. This evolution is due mainly to the expansion in public debt following the fiscal stimulus implemented in the aftermath of the crisis.

However, the situation varies across countries in relation to private sector debt (Figure 2.B). Private sector deleveraging is already in progress in the US, the UK, Germany and Spain. A closer look at the composition of private debt shows that household debt has receded in the countries most affected by the collapse of the housing bubbles (US, UK, Spain) (Figure 2.C). The fall in housing prices after the crisis has resulted in a credit crunch for mortgages, caused both by a shrinking supply of new loans and weak demand from households. In countries such as France, Italy, and Canada, real estate prices have not fallen as much, and personal debt and the entire private sector debt have continued to soar. The most peculiar case is France. The country has avoided an overt financial crisis but piled up debt in all quarters of the economy, resulting in lackluster growth performance.

Figure 2 – Large gross debt stocks in advanced countries: A) Total debt as % of GDP, B) Private sector debt as % of GDP, C) Households' debt as % of disposable income

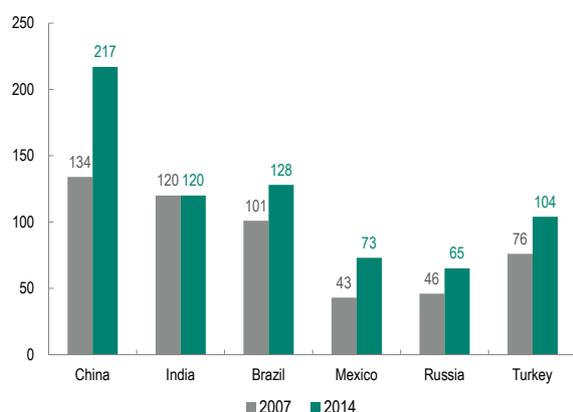


Source: OECD, 2013/14 stand for year 2014 for the US and Portugal, 2013 for the others.

2.2 ...but high debt is mostly a developed economy evil...

In the emerging countries with the exception of China, debt levels are still relatively modest (see Figure 3). India is the only country where total debt has leveled off in the seven years since the financial crisis. India's debt in 2014 was equal to the average of EMEs and developing countries (120% of GDP). However, in these countries corporate sectors are frequently indebted in dollars, and therefore financially vulnerable to depreciation of their exchange rates.

Figure 3 – Gross debt stocks more modest in emerging countries (total debt as % of GDP)



Source: MacKinsey Global Institute (2015), Debt and (not much) Deleveraging, February.

The main areas of concern are in Asia (Japan, South Korea), in Southern Europe (Italy, Spain), and France. It is no surprise that these are the countries showing the largest rises in total debt and (excluding Asia and China) the worst growth performers.

Deleveraging in a small open economy individually, while world growth is relatively robust, and deleveraging the world economy are quite different matters. The experience of Australia and Denmark in the 1980s, and Finland and Sweden in the 1990s does not offer useful advice in relation to deleveraging the world economy. These countries exploited currency depreciation as a powerful way to substitute foreign for lacking domestic demand in the short run. In a context of non cooperation, many countries will count on their exchange rate against the dollar to compete for foreign demand. If global demand becomes persistently weak because of the high levels of indebtedness, the risk of competing devaluations will be high. How will capital markets behave? How will the balance of payments shift? Can the US domestic economy absorb the resulting deterioration in competitiveness? No one has finite answers to these questions. The best that can be done is to rely on what history can teach us.

The dollar has exhibited long and ample fluctuations, lasting about ten years

3 What impact on global imbalances

3.1 The lessons from the past are many...

The dollar has exhibited long and ample fluctuations, lasting about ten years on a real effective exchange rate basis. Those fluctuations are modulated around a long run depreciation trend. They are frequently opposed to fluctuations in the two other main convertible currencies: the euro and the yen. This is a pattern akin to the financial cycle documented by the BIS (see e.g. Borio and Drehman, 2012). Like all asset prices, exchange rates are moved by a momentum created by alternating long phases of overvaluation and periods of undervaluation with no stabilization at their equilibrium value.

Exchange rates exhibit a hybrid pattern. There is a handful of convertible currencies with flexible exchange rates. However, most national currencies are either not convertible or only partially convertible and loosely anchored to the dollar. This results in a semi-dollar standard system enabling large parts of the world, notably emerging countries in Asia and Latin America, to be *de facto* dollarized. Private agents in these countries are inclined to borrow in dollars at lower cost than in their national currencies, while savers assume their wealth will be better preserved by depositing or buying securities in the currency with the highest liquidity. However, when the dollar is appreciating cumulatively, two predicaments arise simultaneously: overvaluation of the exchange rate resulting in loss of competitiveness and increasing cost and amount of debt. The balances of payments in semi-dollarized countries then deteriorate and their governments are either incited to loosen their pegs or pushed to do it under market pressures

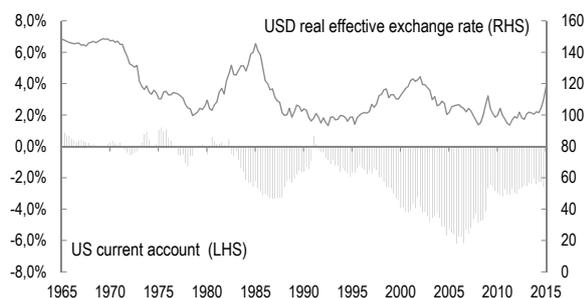
(Coudert, Couharde and Mignon, 2013b). This is why financial crises in emerging countries tend to burst during periods of dollar appreciation. This was the case for the 1997-98 Asian and Russian crises following the large dollar appreciation after 1994 which reached 50% against the yen. Again, after the dollar had appreciated by 30% against the euro between 1997 and 2000, Argentina, at the time a dollarized country with a large share of exports to Europe, fell into a major forex crisis in

December 2001, triggered by a current account deficit that barred the defense of the dollar peg.

3.2 ...and the trade account has been a key driver of FX movements

The dollar appreciation also has adverse effects on the US economy itself. Indeed, the current account is negatively linked to dollar fluctuations (Figure 4). When the dollar appreciates in effective real terms, the US tends to accumulate deficits leading to global imbalances. For example, when the US interest rates surged up to 20% in 1980 to eradicate inflation, the high yields in US financial markets unleashed an avalanche of capital inflows,

Figure 4 – Real effective exchange rate of the dollar and US trade account in % of GDP



Source: BIS and BEA.

propelling a 40% real effective appreciation. The US trade deficit widened and domestic monetary policy was powerless to reverse the momentum. Concerted intervention by the G7 countries was called for at the Plaza agreement on September 1985 to reverse the dollar trend.

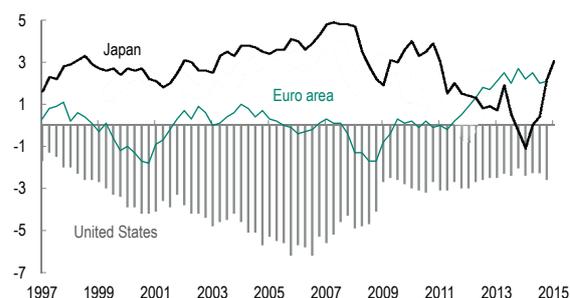
Moreover, the dollar cycle distorts US financial conditions by driving massive capital movements nurturing financial bubbles. A case in point is the equity bubble in 1999-2000, and the housing bubble in 2006-2007. Correlative global imbalances fostered excess world demand which relied on increased leverage and hid the continuous slowdown in productivity as well as the improving income inequality.

Because of distorted conditions of production linked to the persistent misalignments in prices, the turning point in a wave of dollar appreciation gives rise to real depreciation of about the same time span and the same magnitude. It unfolds partially flow imbalances but never brings back the US balance of payment to equilibrium in current accounts. The euro area and Japan have worked at cross purpose since 2011. On the one hand, Abbe's policy dedicated to reflation the Japanese economy has succeeded in shrinking Japan's huge surplus. On the other hand, in pursuing systematic fiscal austerity in all countries together, the euro area, which was in equilibrium for a very long time, has been accumulating fast-increasing current account surpluses for two years (Figure 5). Those surpluses are essentially captured by Germany. Therefore imbalances continue to accumulate, fed by the lack of cooperation between the monetary authorities of the leading currency countries.

These recurrent global imbalances hint at a structural flaw inside the international monetary system (IMS), namely the fact that international liquidity is provided mainly by one national currency. If this structural flaw is still within the system, there is every reason to believe that another wave of dollar appreciation, already visible on Figure 4, is in motion.

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Figure 5 – Current account balances in % of GDP



Source: OCDE, BEA, ECB, BOJ.

4 Exorbitant privilege and curse of international liquidity

In the current monetary system with competing currencies, and deprived of any international rule, foreign exchange (FX) markets seem unable to share international liquidity at equilibrium exchange rates. Proponents of deep financial globalization assume that this should be possible. However, the opposite always prevails: international liquidity tends to polarize in a single currency.

The reason for this is the public good character of money. If financial globalization is truly complete, there should be a single form of ultimate liquidity that is accepted by every market participant. In a national monetary system it is the central bank that is responsible for matching money demand and supply. In an international system, who is responsible of matching demand and supply of international liquidity? There might be an agreed rule that may be tacit and automatic (the gold standard) or formal and procedural (an eventual SDR standard) which subjects the issuer of the national key currency to take account of the liquidity needs of all players worldwide.

The dollar was subjected to some formal rules in Bretton Woods system but these were ignored by the US government which finally unilaterally repudiated the Bretton Woods system in August 1971. The consequence of this was outlined long ago by Robert Triffin (1960). The Triffin dilemma shows that the supply of international liquidity depends unilaterally on US domestic interests which have no reason to match the needs of the rest of the world. Therefore the international economy is almost always unbalanced, because it suffers from too much or too little international liquidity. The dilemma was observed in the Bretton Woods system. Why did it pervade in a world of multiple currencies under flexible exchange rates? Why cannot international liquidity be shared optimally between two or more currencies at equilibrium exchange rates? The answer is provided in Box 1. If two currencies compete for the same public good, *i.e.* international liquidity, they become perfect substitutes.

Box 1– Indeterminacy of the exchange rate in a world of perfect financial integration

Let us consider a world of two countries $i=1,2$ competing for the status of international liquidity suppliers. The monetary equilibrium in the two countries is expressed as the equality between money demand and supply:

$$m_1 - p_1 = \theta_1 y_1 + \alpha(r_1 - r) + \sigma(r_1 - r_2) \tag{1}$$

$$m_2 - p_2 = \theta_2 y_2 + \alpha(r_2 - r) - \sigma(r_2 - r_1) \tag{2}$$

where m_i is the money supply in country i , p_i its price level and y_i its GDP, the three former variables being expressed in logarithm; r_i is the yield on i 's currency; r , the return on a common asset as financial markets are perfectly integrated.

The exchange rate e (in logarithm) follows the purchasing power parity

$$e = p_1 - p_2 = e^* - \eta(r_1 - r_2) \tag{3}$$

with $e^* = (m_1 - \theta_1 y_1) - (m_2 - \theta_2 y_2)$ and $\eta = \alpha + 2\sigma$; $r_1 - r_2 = \delta = (R_1 R_2) - \hat{e}^a$

where e^* is the equilibrium exchange rate; \hat{e}^a is the expected change in the exchange rate; R_i the domestic money interest rates in country i . Therefore the equilibrium exchange rate is:

$$e = e^* - \eta \delta = e^* - (\alpha + 2\sigma) \delta \tag{4}$$

When substitutability gets perfect, $\sigma \rightarrow \infty$ It follows that $\partial e / \partial \hat{e}^a \rightarrow \infty$. In addition, the two currencies can circulate only if their prices are non-zero and finite. Hence they must have the same yield: $\delta = 0$. The exchange rate is then indeterminate. International liquidity is not defined.

Therefore the exchange rate between them is indeterminate. Beyond the math, the reason is intuitive. The market cannot determine the price of two candidates for the same public good since the money demand functions cannot be separated.

4.1 Currencies should be diverse, and not alike

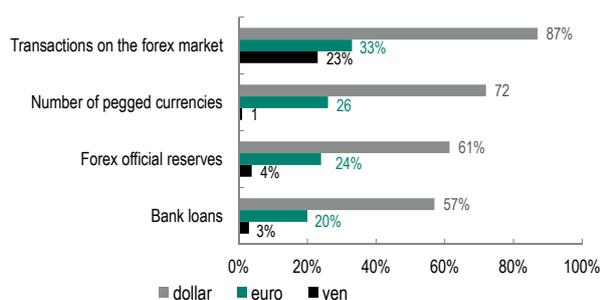
In the real world, this means that the more the currencies become similar, the more unstable will be the exchange rate. The slightest difference in monetary policies or anything that changes the beliefs on the future exchange rate will trigger huge capital rebalancing between the currencies that pretend to international liquidity status. Indeed the demand for money is not demand for an individual good. It is demand for a network, the system of payments. The demand by each individual for the services of a network is an increasing function of demand from others.

Network externalities explain the concentration of international liquidity in a single dominant currency. The dollar has been the dominant currency in all the functions of international money despite continuous shrinking of the relative importance in the world of the US economy. Indeed, it is overwhelmingly dominant on the forex market (87% of transactions), in the number of pegged currencies (72), the currency composition in forex official reserves (61%), and bank loans (57%). As shown in Figure 6, the closest challengers, the euro and the yen, are far behind on all these criteria. Because of the dollar dominant position, central banks in emerging countries have an interest in loosely pegging their currencies to the dollar and keeping their FX reserves in dollars. This supports a dollar zone that is roughly stable in terms of share of world GDP (around 60%). This is about the same as the share of the dollar in official reserves, which has been fluctuating between 60% and 65% of total reserves for about 40 years [BIS Quarterly Review, December 2014, pp.23-26]. The dollar appreciation and depreciation cycles stem mainly from the behavior of the investing community, partly public agents from countries such as China which have reserves far in excess from what is needed to manage their own currency, and partly private investors in search of yield within the constraints of portfolio diversification. The behavior of those actors is in part sensitive to expectations about future macroeconomic conditions, and in part determined by the characteristics of the asset management industry which is driven by short termism and mimetic impulse.

Network externalities also explain why the collective character of the demand for dollar assets makes it propitious to momentous dynamic driven by self-fulfilling beliefs. It follows that long dollar cycles have become the norm in an international monetary system that continues to rely on the issuer's "exorbitant privilege".

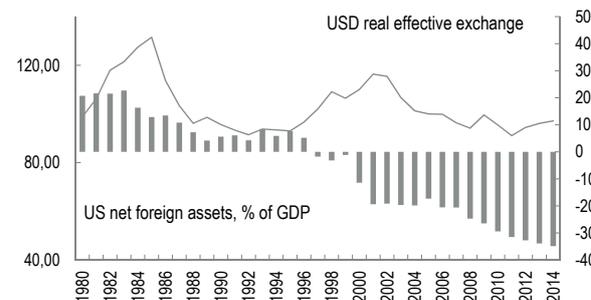
One collateral consequence of this dominant role of the dollar in the IMS is that it does not follow the same rules as other currencies. Indeed, there are several empirical studies showing that in the long run, exchange rates tend to evolve in line with their fundamentals (see e.g. Béreau *et al.*, 2010; Coudert, Couharde and Mignon, 2013a). The two most significant variables in these studies are the ratio of the productivity of the tradable and non-tradable sectors relative to partners', the so-called "Balassa-Samuelson effect"

Figure 6 – International currencies: the dollar prevails, the euro and the yen follow far behind



Source: BIS, ECB, IMF.

Figure 7 – A distorted link between real effective exchange rate and the net foreign assets



Source: Real effective exchange rate: BIS; net foreign assets: Lane and Milesi-Ferretti (2010) updated by current accounts of IMF's WEO.

and the country's net foreign assets in percentage of GDP. This latter variable usually plays a major role: the more net foreign assets a country accumulates, the more its real exchange rate will appreciate without hindering the current account balance. However, this empirical relationship is not significant in the case of the US. Net foreign assets have been falling since the mid 1980s due to permanent current account deficits, and this downward trend does not match the dollar cycle (Figure 7). At some point, if the dollar were any other currency, the drop in net foreign assets would trigger a massive depreciation. It is only the very specific position of the US at the core of the financial system that has prevented this adjustment from happening.

5 Conditions are ripe for a new dollar cycle

Let us sketch the unfolding drama. Systemic financial crises always give rise to economic depression. Some are violent because the overhanging debt is swept out brutally in the counterpart to capital destruction, leading to cumulative falls in GDP for several years. This was the scenario in the US in the early 1930s. Other crises are different. The deflationary crisis in the 1890s as well as the present financial crisis are both protracted depressions that linger for many years, while not precluding some short run expansions interspersed with episodes of recession. These episodes are described as secular stagnation or persistent headwinds, depending on how the economists interpret the anomalies they observe. What is certain is the inability to reduce total debt, and the subsequent weakness of productive investment, diminishing productivity gains and stifling real wages.

5.1 The US productivity puzzle matters for the dollar

The slowdown in US productivity is particularly puzzling. In the first quarter of 2015, US GDP barely grew, while employment increased by nearly 200,000 jobs a month and labor productivity fell at an annual 1.9% rate. This led to a 2.1% annualized decline in the GDP in the fourth quarter of 2014. This might be a short-run phenomenon that will be self-correcting. However, the longer-run trend points to slowing productivity in all major developed countries, starting well before the financial crisis. It runs alongside the decline in productive investment as a share of GDP, and flagging investment in education. The crisis has accentuated those headwinds.

There are many clues to this protracted depression: ultra-low nominal interest rates and subpar inflation rates in developed countries despite years of monetary stimulation, and a long downward slide in world interest rates. This means that the natural rate, a measure of the marginal equilibrium real return on capital, has slid to nearly rock bottom, or has become negative, consistent with a glut in idle saving and a dearth of investment projects. Another anomaly is the surge of equity markets especially in the US, with the US S&P 500 index tripling from its lowest point in

March 2009 to the end of year 2014. The market may soon be in bubble territory [Berg, 2015] since stock prices stand at nearly two standard deviations above their historical average according to three measures: the cyclically adjusted price earnings ratio (equity price/10-year moving average earnings) calculated by Robert Shiller, the Q-ratio (market value of non-financial corporate equities outstanding divided by their net worth), and the Buffet indicator (ratio of corporate market value to GNP). For example, the cyclically-adjusted price-earnings ratio has already reached historical highs, hinting at overvaluation (Figure 8). Its May 2015 level of 27.2 was hit only twice during the 130 years for which data are available: once just before October 1929, and once just before the collapse of the dotcom bubble in the early 2000s.

Figure 8 – Price earning ratios hint to an overvalued S&P500



Source: Robert Shiller website. The chart displays the cyclically adjusted ratio of price to 10-year earnings average. The red line corresponds to the long-run average (LRA).

If the continuous rise in equity values is being driven by fundamentals, then it is the amazing rise in profit margins reflecting stagnation in real wages (and diminution in real median wage). In 2014 the yearly S&P 500 profit margin reached 9.2%, well above the historical average of 6.3%. Such a high level of equity valuation can only be sustained if the profit margin remains at this stratospheric high. However, according to the US Bureau of Economic Analysis corporate profits fell by 1.6% in the fourth quarter of 2014. This was reflected in renewed volatility in the stock market. The exchange rate of the dollar also enters the picture.

5.2 So does the corporate performance gap

The dollar appreciation was driven by the gap in corporate performance between the US on the one side and almost any other part of the world on the other. The explanation lies in the huge transfer of debt from the private to the public sector in the US which occurred in 2009. This resulted in a massive deleveraging in housing, reengineering an early expansion in consumption, while the euro area was still sinking further into recession in late 2011. Since mid-2013, market participants have been expecting a long-term divergence in monetary policy between the US on the one side, and the euro area and Japan on the other. In October 2014 the Fed closed its massive bond buying program, the so-called

quantitative easing (QE) policy, and began to hint at a possible rise in interest rates in 2015, while the ECB was launching its own QE program to counter the seemingly unstoppable drift in euro area interest rates to unseen lows. Meanwhile, there was bad news from all quarters of the emerging market world including Asia, primary commodity producers, and oil exporters. It was absolutely necessary to launch the momentum driving the dollar rise against all other currencies, the usual symptom of a dollar cycle.

A dollar appreciation introduces more uncertainty in the world. An example of this is the gap between the Fed's estimate of interest rates in its March 2015 medium-term perspective and the estimates provided by the futures market in April 2015. The interest rates foreseen by financial markets (0.5% end-2015, 1.35% end-2016 and 1.8% end-2017) are much lower than the Fed's forecasts - 1.1% end-2015, 2.5% end-2016, 3.6% end-2017. Such low expected interest rates imply that there is a non-null probability that rates will return to zero and stay there. In the view of bond dealers in New York City this probability was 20% in January 2015. This reflects their doubts about the resilience of the US recovery.

Whichever estimate is correct, there will be a serious disturbance.

If the Fed is wrong, the disturbance will resemble that seen in Japan in 2006, or Sweden in 2008, or in the US itself in 1937: that is, a premature rise in interest rates which had to be reversed after it triggered economic shocks that reignited deflationary pressures. The current momentous appreciation of the dollar might be just such a shock. Meanwhile, the unexpected upturn in oil prices from the nadir of US\$45 per barrel to over US\$60 in early May adds to the uncertainty.

The Fed justifies its forecast on its belief that the nominal natural rate will be 3.75% in 2017 with inflation back to its 2% target and a real rate of 1.75%. Secular stagnation is still priced in the bond markets. If they are wrong, gigantic losses on long positions will arise from both a bond price fall and a dollar reversal.

Why is the dollar the flaw in this picture? The Fed is involved in a delicate endeavor to change guidance and end the era of low rate *promises* before being certain interest rates must be raised. The bet is risky because the economic weakness in the rest of the world, and the sharp appreciation of the dollar could slow growth in the US despite the collapse in oil prices. Declining inflation expectations are worrisome because they might not reverse quickly. Inflation moving back to target has been the decisive factor in Fed policy but it might be negatively affected by the strength of the dollar.

5.3 Currency misalignment could be costly for growth

What can be the drag on the world economy due to the misalignment in exchange rates? The first drag could occur in the US. So far, the momentum towards dollar appreciation will see a

10-year bond yield in the US of 1.7%, German Bunds of 0.3%, and Japanese government bonds (JGB) of 0.25%. At the dollar price already achieved, S&P 500 US companies' earnings are already declining. As already mentioned, the high equity price rests on an exceptional level of corporate earnings that has begun to plummet, at least for exporting companies and those with a high share of profits generated abroad and repatriated in the US. A quarter of the profits of firms in the S&P500 are earned in foreign currencies. Sagging profit margins have the potential to trigger a stock market crash, that will reduce the net wealth of investors. Even if we consider only the domestic economy, the US recovery is vulnerable to interest rate hikes since it is pulled by consumer spending driven by cheap credit, and not by growing middle class earnings. This takes us back to the Fed's balancing act, which is fiendishly difficult.

Fed staff has made simulations of the impact of the dollar rise on the US economy using its sophisticated macro econometric model "Ferbis". Between end-September 2014 and end-March 2015, the dollar appreciated 13% in trade-weighted terms. According to Ferbis, a 10% rise in the dollar index has cumulative impact over three years, leading to 0.75% loss of GDP after two years. The

first-order effect is the drag on demand through the trade balance. There are countervailing forces, however. Inflation will be 0.4% lower than it would have been otherwise after two years following the shock. Lower inflation raises consumers' purchasing power, which offsets part of the demand weakness from foreign trade. But it can work the right way, only if inflation expectations are well-anchored. In the present setting a negative shock on inflation is not the Fed's taste. Fed's policy might become more cautious in raising interest rates.

The other drag might come from the rest of the world. This would repeat the drama that surrounded every previous dollar cycle: a rise in the dollar driven by momentum hurts dollar borrowers in emerging markets. Furthermore misalignments distort cross exchange rates between third currencies. Because the level of debt is already too high, and because it is largely denominated in dollars, the depreciation of national currencies does not create new demand. As happened in the Asian crisis, it might trigger financial distress. Admittedly, the countries involved will have greater capacity to ward off this problem but they will not be able to increase domestic demand in these circumstances. Furthermore, not all countries have a reserve cushion. For example, South Africa and Turkey are less protected than Russia or even Brazil. Hence, countries competing for exports might launch currency wars that make everyone worse off.

Since the financial crisis, dollar debt in the emerging markets has increased rapidly to benefit from much lower borrowing costs with no attempt to hedge. According to the BIS, the stock of dollar debts owed by non-financial borrowers outside the US has grown by 50% since the financial crisis. The outstanding dollar debt outside the US reached US\$9 trillion, half of which is in emerging markets. The

The Fed is involved in a delicate endeavor to change guidance and end the era of low rate promises before being certain interest rates must be raised.

firms that match their dollar revenues with the costs of servicing their debts are oil and mining companies. Their incomes have plummeted with the collapse of commodity prices. Other firms, mainly in Asia, are suffering from currency mismatches.

In the wake of ultra-accommodative policies implemented by the ECB and the Bank of Japan, the Bank of Korea has resorted to an interest rate cut of 1.75%. In China, facing growth headwinds the central bank has cut its policy rate in November 2014, February and April 2015 (25bps each) accompanied by cuts of 50 then 100 bps in bank required reserve ratios plus more unconventional measures to boost credit in some sectors and SMEs. Those measures aim at supporting domestic demand to offset the 14% appreciation of the yuan effective exchange rate following the dollar movement.

The pressure on the trade balance arises at the time when China's leadership has decided to shift gears on the route to yuan convertibility. Looking for reserve currency status, the government has decided to open the capital accounts substantially, while still keeping instruments to preserve an orderly transition. Nonetheless there was a huge impact: according to SAFE (the foreign exchange department of the central bank) roughly \$300bns flowed out of the country in the last six months. Because the exchange rate is still managed, official reserves have declined for the first time since the Asian crisis. Those capital outflows reinforce the strength of the dollar.

All countries cutting their interest rates justify their move like the ECB, as an attempt to increase domestic demand and not weaken the exchange rate. However, in pushing nominal bond yields into negative territories, the ECB incentivized capital flights, pushing the dollar higher and global bond yields lower. The ECB's ultimate aim is clearly to boost domestic demand. Meanwhile the countries doing the same thing at different speeds and on different scales are influencing their relative exchange rates, with the result that the net effect on real effective exchange rates is difficult to predict. For the time being, in the context of an ageing population, stagnant wages and high private debt, monetary policy is failing to spur domestic demand in either Europe or developed Asia. A successful domestic recovery will decide the fate of the dollar cycle: either it will drag the world out of stagnation by deleveraging outside the US or it will be the catalyst for renewed financial turmoil cum relapse into stagnation.

6 Conclusion

In the spring of 2015 the mood is strange. The political governance in Europe continues to be powerless and involves much bickering. The latest episode of the Greek crisis shows that lessons have not been learned. Meanwhile the ECB has launched a broad and ambitious QE program, hoping to raise euro area growth to 1.5% in 2015 from the 1% forecast in December 2014. If successful, this will be no mean achievement. However, the inability of governments to spur public investment means that the transmission mechanism to uplift growth might rely disproportionately on the export channel triggered by a euro depreciation.

6.1 Implications from and for other currencies

The optimistic scenario bets that the depreciation of the euro has already been large enough to create activity in the euro area with the help of QE to boost domestic demand. Since May 2014, the euro has fallen 25% against the dollar, and 13% on a trade-weighted basis, while the dollar has jumped 22% on a comparable basis. It is argued that this positive outcome will avert deflation in Europe and relieve the US economy from the impossible task of pulling the rest of the world out of its debt and other problems. The recent modest rebound of the euro against the dollar from \$1.05 to a little over \$1.10 suggests that the former phase of euro depreciation is over now.

This narrative may be too sanguine. If it rests on exports, the euro area recovery could be short-lived because of the asymmetry in Europe. Exports will benefit mainly Germany and increase its already very large trade surplus. Even more important, the dollar has risen against all other currencies, which is a symptom of a dollar cycle. It would seem that QE has evolved into competitive easing. In the first three months of 2015, the Brazilian real, the Turkish lira, the Russian ruble, and the South-African rand have lost between 15% and 20% of their value against the dollar. This evolution raises three kinds of uncertainty. The first one is whether the US recovery is sufficiently strong to stand alone against the momentum of dollar appreciation cum higher volatility in asset markets. The second one concerns the impact on emerging countries and the resilience of the private actors that are heavily indebted in dollars. The third uncertainty stems from the euro area governance and Greece running out of cash in another episode of the prisoner's dilemma policy, which might catalyze a much more unpleasant scenario.

At May-end 2015 the dollar was rallying again, against the yen which fell at 124 for the dollar (weakest level of the Japanese currency since 2002) and 1.08 dollars against the euro. The momentum of the dollar cycle is probably not over. On top of economic fundamentals that are still tilting on the side of sustained dollar appreciation with the upcoming divergences in monetary policy, multiple geopolitical drama might trigger the safe haven status of the key currency. Whether it happens, the dollar would spike and alter the pattern of relative prices worldwide. Dangerous debt pileups, partly due to failed deleverage in developed countries, partly to further debt accumulation in other countries since 2009, would made blatant vulnerabilities hidden by the ultra-low interest rates cum quantitative monetary policies. Then the world economy would face the conundrum always postponed since the debt-driven financial dynamic has dominated the real economy: how is it possible to deleverage total debt without slumping into world depression?

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CEPII Policy Brief
CEPII's insights on international economic policy
CEPII – Paris – 2015
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