Phinance Technologies ECI Report

November 2nd, 2022

Early Cycle Indicators (ECI) Report

On the forward prospects of the US Economy

By Phinance Technologies

Contents

1   Summary of Current Economic Situation

Our composite ECIs are normalised to a Standard Gaussian distribution. The mean is close to 0.0 and the standard deviation is 1.0, with values ranging from -3.0 to +3.0. In our client reports, to facilitate the interpretation of our ECIs we transform them into an equivalent **Expansion Index** for the economy ranging from -100% to +100%, which refers to the strength of economic expansion relative to its "normal" rate (typically 2.0%-2.5% in the US).

ECI Composite 12m	Expansion Index: -90% ECI Value: -1.63
Last date	1/11/2022

Our benchmark 12-month Composite ECI indicator points to a severe recession in the US economy in the next 6 to 9 months. The 12-month composite ECI Expansion Index dropped to a 2-year minimum of -90% from the previous report's value of -49% (August 2022).

Last 12 Months	Expansion Index (-100% to +100%)	ECI value
Nov-22	-90%	-1.63
Oct-22	-80%	-1.29
Sep-22	-77%	-1.21
Aug-22	-49%	-0.65
Jul-22	-37%	-0.49
Jun-22	-12%	-0.15
May-22	23%	0.29
Apr-22	25%	0.32
Mar-22	45%	0.62
Feb-22	41%	0.56
Jan-22	46%	0.52
Dec-21	65%	0.73
Nov-21	60%	0.90

This month's -1.63 ECI reading, and its sharp decline since our last report in August 2022, points to a severe degradation in economic conditions in the months ahead. The current reading confirms an upcoming recession in the US, but now also indicates that the recession will likely be deep. The severity (length and depth) of the coming downturn is now looking to be more severe than the 2001 recession and closer to the 1990 recession in the US. We believe that our indicators have not bottomed yet, so we'll be playing close attention to developments in the coming months. We also remind our readers that economic contractions are associated with ECI readings of -0.5 or below.

On Wednesday the 2nd of November, the Fed announced its fourth large interest rate hike of 0.75% (to a 3.75%-4% range). The economy had already been at the brink of recession since mid-

2022, and the latest rate hike will likely worsen the coming economic downturn. From our ECI's we believe that the economy was already descending into a recession by August 2022 and we now fear that the current Fed actions could lead to a severe economic and market meltdown, given the background of the degradation of our ECI's since August. As unemployment rates are low, the Fed is trying to rein in inflation at any cost.

Geopolitical risks:

The severity of the coming economic recession is likely being aggravated by geo-political considerations such as the expansion of the Russia-Ukraine conflict to involve NATO. Furthermore, China is in the grip of an internal debt crisis caused by many years of excess building, financed by debt. A geopolitical conflict in the region could distract the Chinese from its internal problems but could precipitate a further tightening of global supply chains. Contagion effects in China's periphery could lead to a more severe version of the 1998 Asian crisis which would spill over to the US economy.

Our ECI will pick up on these risks should they materialise and keep our ECI reading ahead of economic developments.

For a more detailed analysis, go to section 5.

2   Why is this report important?

Economic booms and recessions (contractions) are swings in economic activity that have a profound impact on economic fortunes over time. The economic booms tend to give rise to a new generation of wealthy individuals, and these economic gains have spillover effects to the rest of the economy. On the reverse side, economic contractions tend to filter out those individuals or corporations that overextended themselves in the boom phase. After the recession, theoretically the strongest, most efficient and conservative companies will survive the shake out enforced by the economic contraction.

Many times, the difference between the losers and winners of the boom will be those companies or individuals who best know the market, both its opportunities and limitations. The quality of information and execution will determine the best players and those are the most likely to gain from both the boom-and-bust phases of the cycles.

The main motivation of this study is to have a system of economic indicators that anticipate the swings in business cycles. With timely information on the status of the business cycle, individuals or corporations can time their risk-taking activities or projects to benefit from the cycle, gain tactical advantage, instead of being adrift at the mercy of the ups and downs of the economic cycles.

As the US economy is still (together with China and Europe) one of the largest in the world and with globalization, global economies are more interconnected, this report is also very useful for anyone to exposure to the US market.

Who would benefit from this report?

- Any corporations who have exposure to the US or global economy.
- Wealthy individuals and family offices.

   Examples of possible practical applications:

- Investors who are looking to adjust their portfolios for tactical advantage.
- Investors who want to hedge their portfolios from certain market exposures, connected to the US economy.
- Bond Investors who are exposed to credit risk.
- Corporations' planning departments or decision makers who want to make sure of the adequate timing and forward prospects for projects, price negotiations, marketing campaigns, buying or selling points.
- Corporations' finance department who would benefit from guaranteeing access to liquidity before a credit crunch.

2.1   Investment Opportunities

Some of our clients' feedback is that this report is too much geared towards pointing out possible risks for investment due to economic slowdowns or recessions. They ask us how this report can be used to target investment opportunities.

Our answer is that in general, economies grow as human creativity and productivity enables us to produce faster and better and in general to do more with less. Economies always have an underlying process of renewal through a process of creative destruction. In rare occasions economies overextend themselves to a degree that subsequently leads to an economic recession. Our report allows our clients to benefit from an awareness of **where** in the cycle the economy is and provide them **advance warning** of incoming "problems". All the rest are opportunities!

We believe that to find investment opportunities we need a different approach, a multi-layered approach from the top-down and bottom-up. At Phinance Technologies we specialise in doing research to find top-down investment opportunities by analysing the economic determinants and risk factors for different products or businesses. For that we use demographics and other long-term macroeconomic variables. Please contact us for more information.

3   Our Early-Cycle Economic Indicators (ECI)

Our Early-Cycle Indicators anticipate future changes in the economy. We use leading indicators from different economic areas, such as construction, interest rates, stock market or industry surveys, that typically anticipate changes in the economy. Relationships between different economic indicators and the broader economy are difficult to untangle due to the causal relationships between them. For example, while a drop in the stock market might sometimes anticipate an economic downturn, it also is true that an economic deceleration will impact the stock market.

We investigate these different relationships with great care. Once the individual indicators are thoroughly examined, we build composite forward looking indicators for different time frames. Our 3m forward looking composite indicators put more weight to shorter-term indicators while our 12m forward looking composite indicator put more weight on longer-term economic indicators.

We call our indicators Early-Cycle indicators because they are intimately linked to the shorter-term economic fluctuations such as the Kitchin Cycle (known as the Inventory cycle lasting 3-5 years) and Juglar Cycle (known as the Business cycle, lasting 7-11 years).

Our Composite Early-Cycle Indicators provide investors and business decision makers a tool to understand where in the business cycle they are, so that future events don't catch them completely by surprise. Our indicators are not a matter of opinion, they establish a relationship with future economic changes (see Section 4), with a very high statistical significance (with regression t-stats above 20 and R2 about 0.4).

Recessions are rare events, occurring about 1 in every 10 years. Most recessions are relatively short-lived painful restructurings of the economy, which have limited broader impact. Recessions such as the 2008 housing crisis, with systemic proportions, even though extremely painful, are even rarer. Based on our economic indicators we give our opinion of whether an economic slowdown is just a normal recession or has the potential to be systemic in nature. With this tool, investors and businesses can manage their exposure to leverage, large projects, timing of investments accordingly.

3.1   A typical economic cycle

A typical business cycle lasting 7 to 11 years (the Juglar cycle). The business cycle results from the investment into producing more fixed capital (through new plants and new equipment) in order to satisfy demand, occurring after the increase in employment of the existent fixed capital. The investment in fixed capital frequently resorts to leverage (debt) and has a spillover effect on land prices and housing. The mechanism for the breaking of the cycle could be triggered by lower business profit due to the excess supply produced by the over-investment, or through the rise in market interest rates (by rising inflation) due to booming economic conditions and low

unemployment levels. The overall process could well be described by Figure 3.1 and the explanation of the individual phases of the cycle are laid out in (Alegria, 2021).
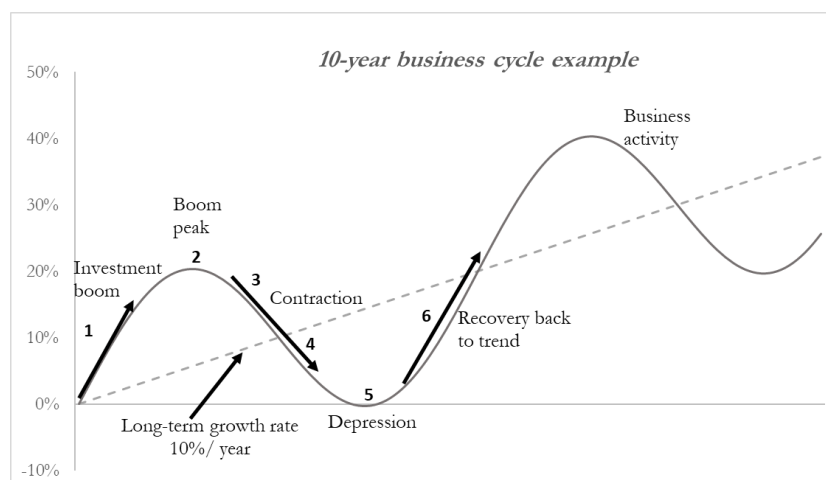

Figure 3.1 - Exemplification of a typical business cycle

The Kitchin cycle is a higher frequency phenomenon described by Joseph Kitchin in 1923. It is also known as the inventory cycle as it is thought to be related to the build-up of inventories by companies (through the increase of capacity utilization), reacting to positive economic prospects. As the inventories accumulate excessively, prices come under pressure and output is reduced. The cycle has a period between 40 and 59 months, this is, around 3-5 years. The Kitchin and Juglar cycles are intimately related as the Juglar cycle could be considered as the combination of two or three Kitchin cycles of expansion and contraction of inventories.

Our composite early-cycle indicators (ECI) anticipate fluctuation in the economy due to the Kitchin and Juglar cycles, providing us a barometer to the current situation of the economy and to future developments at different time frames.

3.2   Building of our Composite Indicators

Our composite indicators are built using the combination of individual economic indicators. Each indicator anticipates the economy by some time frame ranging from 3 months to 15 months. We therefore classify these individual indicators as:

Short-Term, ST, 3m

Mid-Term, MT, 3m-6m

Long-Term, LT, 9m-12m

Very Long-Term, VLT, 15m

3.2.1   Composite ECIs time frames.

Using the different indicators, we build composite indicators that aim at predicting future growth in the economy (typically Real GDP) for different time scales ranging from 3m to 15m. Our composite indicators are described in the table below:

ECI indicator	Time Frame
ECI_Composite_3m	3m
ECI_Composite_6m	6m
ECI_Composite_9m	9m
ECI_Composite_12m	12m
ECI_Composite_15m	15m

The longer-term indicators provide us a significant advance warning for future changes in the economy, which could be seen up to 12 to 15 months. In some circumstances, our longer-term indicators show signs of danger ahead, which happen to not lead to a full-blown recession due to underlying resilience of the economy. The shorter-term composite indicators are useful for confirmation of the economy being in the path of entering a recession in about 3 months.

3.2.2   Normalised ECIs. How to interpret them?

Our composite ECIs are normalised to a Standard Gaussian distribution. The mean is close to 0.0 and the standard deviation is 1.0, as illustrated in Figure 3.2.
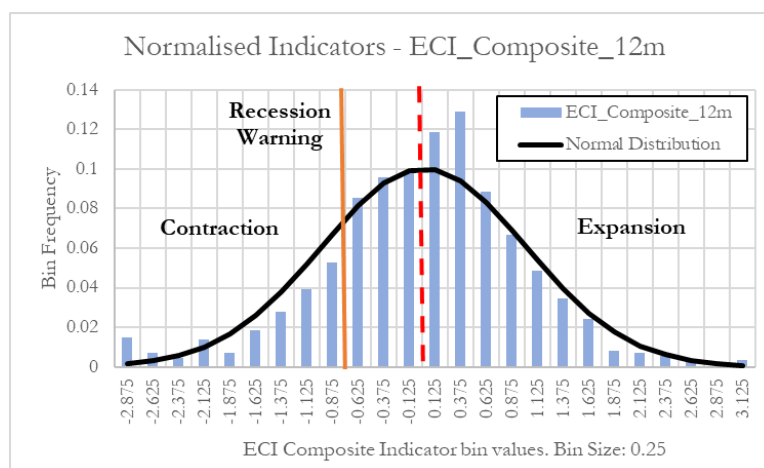

Figure 3.2 - Histogram of the Composite ECI 12m.

The interpretation of the composite ECI is based upon the previous figure: Negative values of the indicator refer to expectations of an economy running below par in the future 12 months. When the indicator goes below a value of about -0.5, an official recession warning is sent out to our clients as a guide; values below -0.5 point to a declining economy. Whether the economy enters an actual recession as defined by the NBER is dependent on other factors which go into the official declaration of a US recession.

In our client reports we transform our **ECI** value into an equivalent **Expansion Index** for the economy. The index reflects the rate of expansion/decline of the economy relative to its "normal" economic performance. The expansion index is the cumulative probability associated with our indicator value. The equation below illustrates how the expansion rate is computed.

$$\textbf{Expansion Index = (Norm(x) -50\%) x 2.}$$

Where Norm(x) is normal cumulative probability distribution. Table 3.1 illustrates how to understand the composite indicator values converted to expansion rates for the economy.

ECI value	Norm(x)	Expansion Index
-3	0.13%	-99.73%
-2	2.28%	-95.45%
-1	15.87%	-68.27%
-0.5	30.85%	-38.29%
0	50.00%	0.00%
0.5	69.15%	38.29%
1	84.13%	68.27%
2	97.72%	95.45%
3	99.87%	99.73%

Table 3.1 - Converting Composite ECI values to Expansion Index.

Summarizing, a composite ECI value of +3.0 corresponds to an extremely high level of the Expansion Index for the economy of 99.73% (out of a maximum of 100%); and conversely, an ECI value of -3.0 corresponds to a -99.73% Expansion Index for the economy (contraction). A ECI value of 0.0 corresponds to 0% Expansion Index. It should be noticed that a 0% Expansion Index, or ECI value of 0.0 does not mean that the economy is in contraction, but that it is at an average expansion value. As a reference point, at present, for the US economy, long-term changes in real GDP are about 2.0%-2.5% per year.

As mentioned before, when the indicator goes below a value of **-0.5**, an official recession warning is sent out to our clients as indicator; This value corresponds to an **Expansion Index** of **-38%.**

4 ECI Performance

4.1   ECI Performance: Forward predictions for Real GDP

As with predicting the weather, predicting future economic changes is less certain as we increase the time frame for our prediction. Shorter-term predictions tend to be much more reliable as they have a higher degree of statistical significance than longer-term predictions. The relationship between our composite indicators and future Real GDP changes are shown in Figure 4.1.
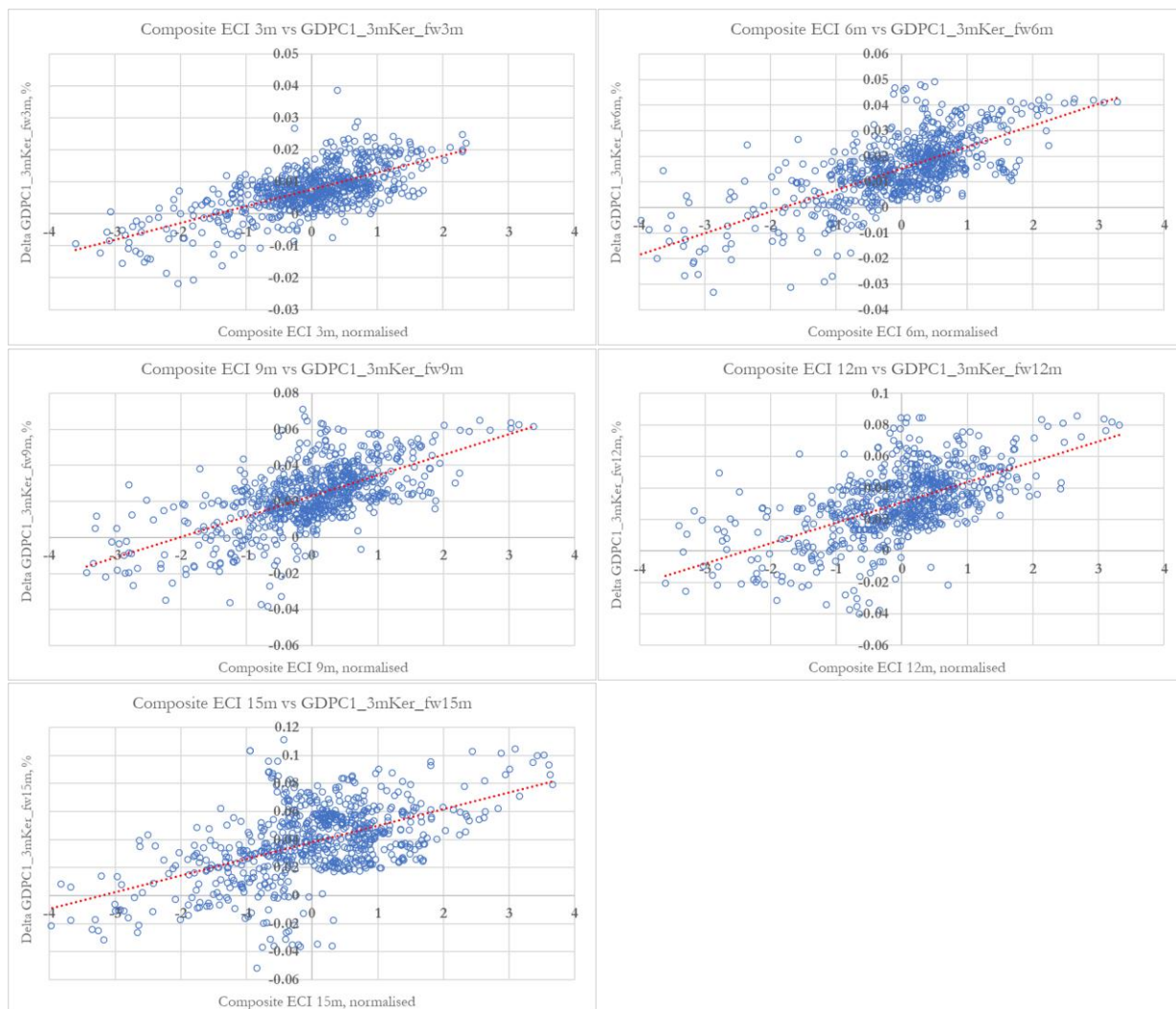

Figure 4.1 - Relationship between the Composite ECI and forward Real GDP, for time frames from 3m to 15m

We can observe that our indicators have a very powerful relationship, even up to the longest prediction time frame of 15m. The graph showing the 15m forward prediction has very few negative data points for Real GDP as economic recessions lasting more than 12 months are a very rare phenomenon.

4.2   ECI Performance: The Time-Series Relationship

The relationship looks even more impressive when comparing the time series of our composite ECI with forward changes in Real GDP, as illustrated by Figure 4.2.
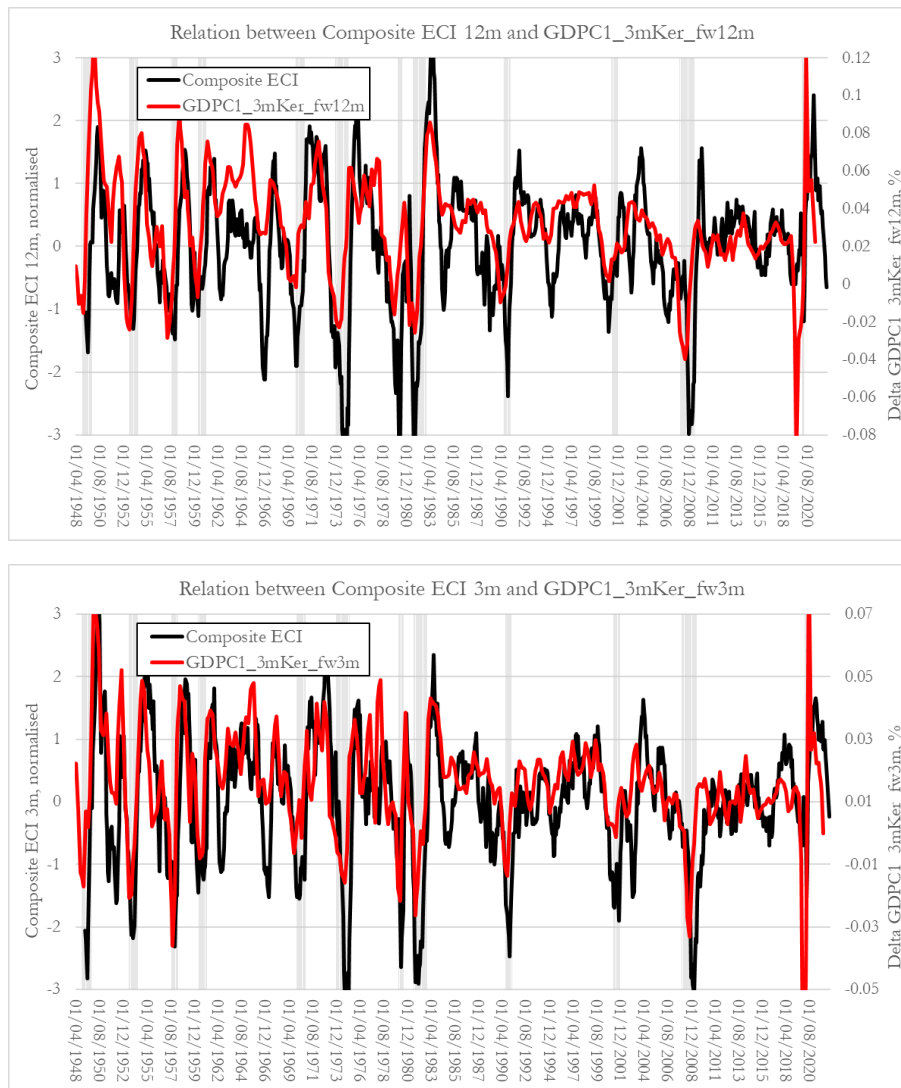

Figure 4.2 - Time series relationship between the Composite ECI. Top: 12m and forward Real GDP. Bottom: 3m and forward Real GDP. The shaded areas refer to US recessions as defined by the NBER.

We can observe that in general the up and down movements of 12m composite ECI closely match the 12m forward ups and down movement for real GDP growth.

It can also be observed that the ECI is not perfect, such as in 1994 with the advent of the tequila crisis in Mexico. In this case, the 12m ECI hit a low value of about -1.0 (an Expansion Index of -68%) with only a small impact on US real GDP, as the crisis affected more the financial sector than the real economy (Figure 4.2 Top). During this period our shorter-term ECI indicators did not fall into recession territory as shown in Figure 4.2 (Bottom).

The 2020 recession was a very particular type of recession that had its causes almost entirely due to an artificial and abrupt man-made interference in the economy. Consequently, it was not picked up by our longer-term ECIs. However, our 3-month ECI did anticipate a pronounced drop in real GDP in early 2020, albeit not to the extent of the extraordinary deep recession that later occurred as a result of the global lockdowns of healthy individuals, to manage the Covid-19 pandemic.

Currently, in November of 2022, our 12-month ECI is now at -1.63 (Figure 4.2 Top), which is pointing to a severe economic recession in the coming months. Technically, the recession has already started since the start of 2022 as the economy produced two consecutive quarters of negative real GDP numbers. However, as unemployment did not rise (as yet) and nominal GDP is increasing substantially (due to high inflation), it is difficult to call the current economic conditions a "recession" as it is more akin to "stagflation".

We believe that the coming months will develop into a full-blown recession, with deflationary pressures surfacing, as well as rising unemployment rates.

5   Current Economic Cycle – where are we?

All our composite ECIs reduced from the previous month's values and went further into negative territory. Our benchmark 12-month Composite ECI indicator now points towards a severe economic **recession** in the coming months. Table 5.1 shows the status of our 3-months to 15-months ECIs.

This month's -1.63 ECI reading confirms our August recession warning for the US economy in the coming months. The length and depth of the coming downturn is now looking to be more severe than the 2001 recession and closer to the 1990 recession in the US. We believe that our indicators have not bottomed yet, so we'll be playing close attention to developments in the coming months as a 2008-like scenario is not unthinkable.

On Wednesday the 2nd of November of 2022, the Fed announced its fourth large interest rate hike of 0.75% (to a 3.75%-4% range). The Fed chairman Jerome Powell also warned that interest rate rises are still not finished[1]. The economy has already been at the brink of recession since mid-2022 and the latest rate hike will likely worsen the coming economic downturn. From our ECI's we believe that the economy was already descending into a recession by August 2022 and we now fear that the current Fed actions could lead to a severe economic and market meltdown, given the background of the degradation of our ECI's since August. As unemployment rates are low, the Fed is trying to rein in inflation at all costs, but as we head into the deepening economic crisis we believe that the Fed will quickly reverse its current policy path.

Geopolitical risks:

The severity of the coming economic recession is likely being aggravated by geo-political considerations such as the expansion of the Russia-Ukraine conflict to involve NATO. Furthermore, China is in the grip of an internal debt crisis caused by many years of excess building, financed by debt. A geopolitical conflict in the region could distract the Chinese from its internal problems but could precipitate a further tightening of global supply chains. Contagion effects in China's periphery could lead to a more severe version of the 1998 Asian crisis which would spill over to the US economy.

Furthermore, the eruption of a conflict between China and the US concerning Taiwan, could create the conditions for a "perfect storm" for the US and world economy.

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[1] FOMC minutes: https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20221102.pdf
Chairman Jerome Powell's speech: https://www.youtube.com/watch?v=ZMzoCuh-Fhg

Composite Indicator Status		
Nov-2022		Oct-2022
ECI indicator	Current Value	Previous Value
ECI_Composite_3m	-0.71	-0.55
ECI_Composite_6m	-1.26	-0.98
ECI_Composite_9m	-1.65	-1.32
ECI_Composite_12m	-1.63	-1.29
ECI_Composite_15m	-1.84	-1.45

Table 5.1 – Phinance Technologies Composite ECIs for different time frames.

Looking back more than 2 years to the history of the current economic situation, after an extraordinarily sharp but brief economic decline from February 2020 to April 2020 (with a 9% drop in real GDP), the economy bounced back strongly. The expansion gained speed throughout 2020 led by the housing sector (see Figure 5.1). Our 12m composite ECI reached its maximum value of 2.3 (corresponding to an Expansion Index of about 99%) by May-2021.
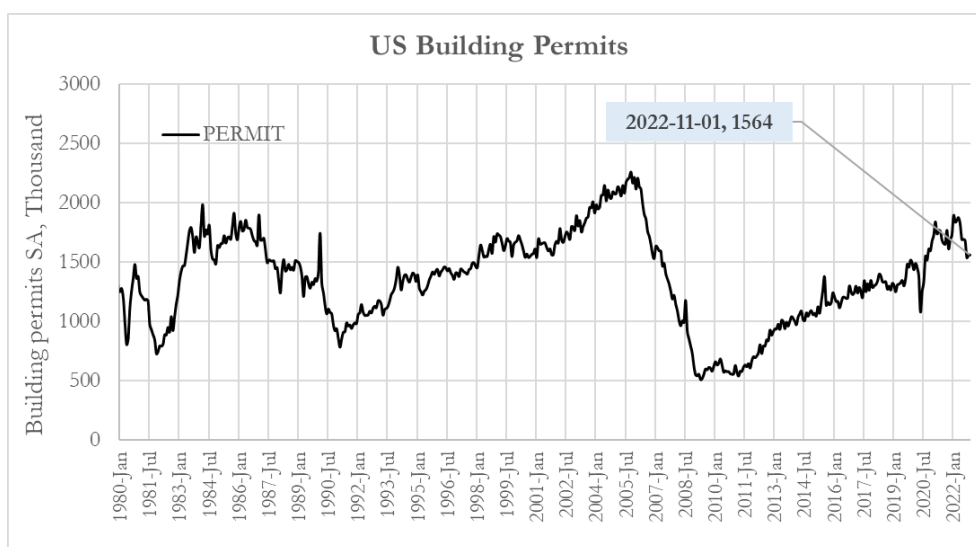

Figure 5.1 - USA - Building permits for new private housing since 1980.

Since its maximum value, in May-2021 our 12m ECI remained at high levels throughout 2021, and subsequently dropping in December 2021 as inflation worries began to materialise. In 2022 the 12m ECI had been hovering at values above 0.5, until April 2022, where it dropped to 0.32, which was the lowest reading in the previous 12 months. Since then, the 12m ECI dropped steadily until the current value of -1.63 (Nov-2022) which corresponds to an Expansion Index of -90%, pointing to a upcoming severe recession. With the unemployment rate currently at 3.5% (see Figure 5.2), there is no more room for economic improvements from lower unemployment rates and the gains must come from productivity gains.

At the current values of our ECIs (shown in Table 5.1), we expect to see a severe economic recession materialise in the coming months. We expect to see a recession that is not like the one in (2000-2001), but more akin to the 1990-1991 recession. One of our longer-term indicators of economic activity, the housing sector suffered a drop since June, however it is still showing strength. Therefore, we believe that the consumer could provide a tailwind for the economy, avoiding a major economic recession (most likely a painful stagflation).

The fate of the economy will ultimately depend on the behaviour of interest rates in the coming months (both market rates as well as central bank rates). An even deeper economic recession might be precipitated by a policy mistake by the Fed, which has tightened monetary policy significantly in the past months, even after the economy being at the brink of a recession since early 2022. The recent 0.75% hike, that took the discount window to the 3.75%-4% range, and mortgage rates close to 7%, might well be the trigger for a crash in the housing sector. If that happens in the coming months, a 2008-like crisis could happen.

Figure 5.2 - US Unemployment Rate since 1980

The previous considerations do not take into account the occurrence of external events such as another unexpected virus outbreak (and subsequent government lockdowns) or the beforementioned geopolitical conflicts. In either case, our shorter-term ECIs will capture the impact on the economy.

Currently, our shorter-term composite ECIs (3m and 6m) point to the economy already being in recession. The continued pressure over global supply chains is adding to the risk of a continuation of higher-than-normal levels of inflation, which is in reality, a stagflation environment. The ISM Manufacturing PMI, which is a reliable indicator for the industrial sector, is still running at 50.2, which is still pointing to an expanding manufacturing economy (see Figure 5.3).
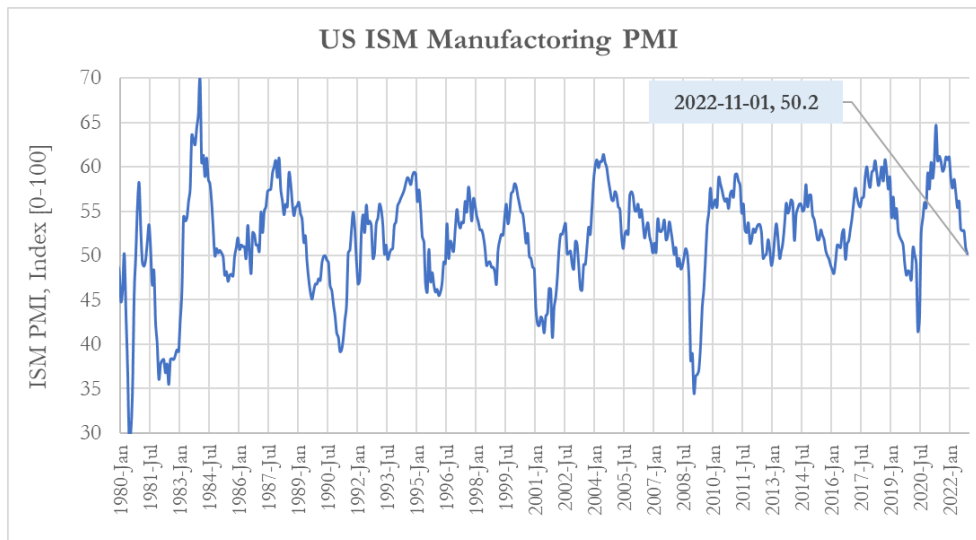
Figure 5.3 - US ISM Manufacturing PMI since 1980

Currently, in November of 2022, our 12-month ECI is now at -1.63, which is pointing to a severe economic recession in the coming months. Technically, the recession began at the start of 2022 as the economy produced two consecutive quarters of negative real GDP numbers. As unemployment has not risen (as yet) and nominal GDP is producing large increases due to high inflation levels, it is difficult to call the current economic conditions a "recession" as it is more akin to "stagflation". However, we believe that in the coming months we will see a deeper recession, with rising unemployment rates and the resurfacing of deflationary pressures.

The commitment by the Fed to taper its quantitative easing and continue its rate-rising cycle (in order to control inflation), risks transforming the coming recession, that already looks likely to be severe, into a systemic financial crisis.

6   Macroeconomic risks

The current macroeconomic environment is one of recovery from the covid-19 pandemic. As pandemic restrictions on individuals' travel and social gatherings are relaxed, the economy rebounded from the deep recession in the winter/spring of 2020/21. The recovery is happening not only in the US but worldwide as well. However, we believe that the longer-term macroeconomic backdrop of high debt levels worldwide and slowing demographic demand will lead to future reallocations of investment and capital.

Debt levels that were already alarming entering 2020, increased extraordinarily as a consequence of governments' response to the pandemic. See (Alegria, 2021). Simultaneously, the increase of central banks' balance sheet as they printed money to buy government debt added a new macroeconomic risk for the coming years: Inflation.

In terms of demographics, large economies such as China, Japan and Korea, from 2020 were set to enter a phase of demographic decline that is unprecedented in modern historical context. The high debt levels mixed with dwindling demographic demand will inevitably lead to periods of painful adjustment to the new reality. The Evergrande debacle that erupted in early 2021 (the bankruptcy process of one of the largest property developers in China) is the "canary in the coal mine" as it is a representation of the wider industry. The construction industry is typically very fragmented and even one of the largest developers such as Evergrande does not represent more than a few percentage points of the overall market.

Our October 2021 "Red card of macroeconomic risks"[2] (which was updated in April 2022) points to the main danger spots from where we expect to see some future drama. How could these risks spill over to the wider global economies? And in particular, what is their impact on the US economy? The aim of this report is to monitor the US economy, using our Early-Cycle indicators, and give our clients an early insight into arising economic pressures from the macroeconomic risks.

6.1   Risk 1 - China slowdown, Asian crisis

We believe that the fate of Evergrande will not solve the needed readjustments for the broader market. Evergrande is the opening salvo of a housing/debt crisis for which the most acute pain will occur sometime in late 2022 to mid-2023, and at a certain point will lead to systemic worries for the banking system. After this acute phase, the market will take 5 to 10 years to digest the misallocated resources of capital and buildings.

Spillover to the US?

At the moment, we don't see any spillovers of the Evergrande debacle to the wider global economy. Chinese authorities seem to have a clear understanding of the situation and have contained the Evergrande situation for the time being. We wrote a short article[3] on why we think the crisis will

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[2] http://www.phinancetechnologies.com/content/Red%20Book%202022-3-10.pdf
[3] http://www.phinancetechnologies.com/content/2022-08-26%20LinkedIn%20Post-7%20-%20China.pdf

have a big impact in China internally, but also that China has more liquid reserves than external debt, which means that China has the means to manage its external obligations.

In the coming 12 months, we will see bouts of renewed troubles from the restructuring of China's property market which will inevitably spill over to advanced economies in Asia or around the world. The impact on the US economy will be tracked through our composite ECIs.

Furthermore, geopolitical tensions between the US and China concerning Taiwan could lead to a conflict with disastrous impact on the world (and US) economy.

6.2   Risk 3 – US Housing market

The US housing market is another major source of risk for the US economy. At this current moment however, it is providing a positive tailwind to the US economy and is expected to continue do so in the coming years.

However, we must be vigilant of a possible turning point in the case of persistent inflation driving up interest rates. Perhaps the Fed raising rates to 3.75-4% in November 2nd 2022 will be the trigger for a crash in the housing market.

6.3   Risk 4 – Europe

Europe is always a possible source of future instability. As we warn in our Red Card of macroeconomics risks, some European countries experienced huge jumps in debt as a consequence of the government responses to the Covid-19 pandemic.

In particular, France's public and private debt levels has been on the rise since 2016 and then in 2020 alone, jumped about 60% of GDP, due to the pandemic. France is now in a situation where it needs to get debt under control and perhaps enact structural reforms and austerity measures to reduce debt in the coming years. These changes will affect an already fickle political situation with the extreme right parties on the rise.

Southern Europe: The southern European countries have made some significant positive inroads in debt reduction since 2016. However, the pandemic obliterated most of the gains and they are back to square one. These countries will also experience the brunt of their demographic decline during the coming decade, so they will have difficulty in reducing the debt levels by means of real economic growth. They will likely want to resort to targeting nominal growth (through higher levels of inflation), which is a policy that will be strongly opposed by the Central and Eastern European nations such as Germany, Austria, Netherlands, Poland, Finland.

Eastern countries: The Eastern European countries, such as Poland, are converging economically towards the European central powers, but are turning away politically from the woke culture that seems to have captured large parts of the European continent. These political divisions, which

pass under the radar at the moment, might turn out to be a political risk for European fragmentation, and therefore renewed European drama.

6.4   ECIs as a tool to anticipate macroeconomic risks

The contagion effect from the macroeconomic risks arising from Europe, current developments in China, the US housing market, or inflation will be picked up by our shorter and longer-term ECIs.

Our composite ECIs will capture the impact on the US economy and provide our clients an advance warning of the severity of the crisis in case it materializes.

7   References

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8   Team

Our team is comprised of a multidisciplinary, multicultural group of individuals who share a passion for finding information and developing knowledge from data-driven research. The team is comprised of scientists holding PhDs from natural sciences (Maths, Physics, Materials Science, Engineering) who have decades of experience doing research in each of their respective fields. Carlos Alegria, the CEO, holds two PhDs (in Physics and in Finance) having published in both areas.

Message from the Carlos Alegria, PhD (CEO)

Back in 2008 at the onset of the US subprime housing crisis, which was the biggest crisis since the 1930s Great Depression, almost no-one "saw" it coming. I realised that in a world awash with data and information, we are actually LESS informed regarding what decisions to make.

The more and more data and information is being splashed about by our media devices, the more important it becomes to answer the question: How do we separate information (signal) from noise? My passion is to fill this gap.

Apart from developing critical research skills over years of doing multi-disciplinary research, I also believe that providing independent and un-biased research is key to support decision making processes at the highest levels of organisations.

9   Contact

Website: www.phinancetechnologies.com