Demetri Kofinas:	00:00	Today's episode of Hidden Forces is made possible by listeners like you. For more information about this week's episode or for easy access to related programming, visit our website at hiddenforces.io and subscribe to our free email list. If you listen to the show on your Apple Podcast app, remember you can give us a review. Each review helps more people find the show and join our amazing community. With that, please enjoy this week's episode.
Demetri Kofinas:	00:48	What's up, everybody. My guests on this episode of Hidden Forces are Kevin Coldiron, Jamie Lee, and Tim Lee. I'm going to let them each introduce themselves at the beginning of the episode, but what I do want to say is that they're the coauthors of a very thought-provoking book.
Demetri Kofinas:	01:04	The book is titled "The Rise of Carry," and in it, they attempt to explain many of the various phenomena that we've seen rise to prominence over the last few decades, and during the last decade in particular like declining levels of volatility in financial markets, rising expectations of mean reversion, diminishing returns on capital, in other words, chronically low-interest rates, sluggish economic growth, narrowing credit spreads, rising debt levels, the widening wealth gap, and the rising levels of political and social instability around the world. All of these phenomena have coincided with the growth of what they call the Carry regime.
Demetri Kofinas:	01:45	Now, many of you will already know what a carry trade is and how it works, but for those of you who don't know or who need a refresher, a carry trade is typically thought of as a type of interest rate arbitrage expressed as a trade between two currencies where a more historically stable currency, the US dollar, the Japanese Yen for example, is used to fund the purchase of a historically less stable, but higher-yielding alternative. A recent example of such a currency is the Turkish Lira, but we've discussed a number of historical examples on this podcast as well, like the Thai Baht in the mid-1990s or the Argentine Peso in the early 2000s. It's important to note, however, that this arbitrage only works because the carry trader, the person or institution buying the higher-yielding alternative is willing to take on the real risk of currency depreciation.
Demetri Kofinas:	02:39	In other words, the risk that the currency that he or she is buying depreciates in value relative to the funding currency by more than the additional interest earned over the lifetime of the trade. So long as everything stays more or less the same, in other words, so long as the US dollar doesn't appreciate much in value relative to the Turkish Lira, this can be a very profitable trade. The problem of course, is that carry trades carry with them the real risk of a reversal or unwinding. This can have significant repercussions depending on the size of the trade, the leverage used, and its number of participants. What my guests argue is that this principle or logic of carry investing has now spread far beyond its origin in currencies and commodities to every corner of the financial markets and that the risks associated with such trades are becoming the core driving forces of global financial conditions.
Demetri Kofinas:	03:36	Since central banks react to these conditions, global monetary policy is increasingly being driven by the effects of carry in a self-reinforcing cycle that is leading us towards higher levels of volatility and the real possibility of a hyper-inflationary collapse in the funding currency, which in this case, because of the totality of the trade, would mean the US dollar and possibly all forms of fiat

money. This is a fascinating discussion, and the second half, in my opinion, is that much better because we apply this framework that we work through during the full episode to specific markets and really put in the time to think about what the implications of this phenomenon are for the political stability of governments, for central banks which risks going out of business in such a scenario, and the prospects for competing private sector currencies, which of course includes a lengthy discussion about crypto and gold.

Demetri Kofinas: 04:34 With all of that said, please enjoy this fascinating conversation with my guests, Kevin Coldiron, Jamie Lee, and Tim Lee.

Demetri Kofinas: 04:47 Kevin Coldiron, Jamie Lee and Tim Lee, welcome to Hidden Forces.

Tim Lee: 04:53 Thank you.

Jamie Lee: 04:53 Good to be on.

Kevin Coldiron: 04:54 Thank you.

Demetri Kofinas: 04:55 Just so listeners know who's who, let's have each of you introduce yourselves and give your names. Kevin, we could start with you.

Kevin Coldiron: 05:03 Sure. I'm Kevin Coldiron. I'm currently a lecturer at Haas Business School at UC Berkeley, and I teach in the MFE program, that's Master's in financial engineering. Prior to that, for a long time, I was owner and manager of a hedge fund firm. We did quantitative equity trading globally, and I started off my career working for Barclays Global Investors in London, which was also an asset manager focus on quantitative investing, so basically using models to pick stocks. Originally, my first job out of college was working for the Federal Reserve Bank of New York.

Demetri Kofinas: 05:44 Jamie, what about you?

Jamie Lee: 05:46 Hi, I'm Jamie Lee. I work for private foundation and I have a deep interest in volatility markets.

Demetri Kofinas: 05:55 And Tim?

Tim Lee: 05:57 I founded piEconomics, which was an economics consulting company serving hedge funds and asset management companies and some non-financial companies too in Connecticut. That was about 16 years ago, but I recently moved back to England where I come from originally. I now live in England as of earlier this year, I moved back just in time for the lockdown. Before founding piEconomics, I worked for asset management companies in Hong Kong and in London as an economist and a global economic strategist.

Demetri Kofinas: 06:33 So, how did the three of you meet, when did you first meet and how did you get the idea to start working on this book?

Tim Lee: 06:39 I guess this isn't widely known, but Jamie's actually my son. He's living in Boston, but we worked together for a period at piEconomics at my own consulting company. I had done quite a lot of work on currency carry trades, and Jamie had

been doing his own work on volatility trades in the stock markets, particularly the US stock market. We came to a realization really that there were a lot of forces behind the volatility selling trades, both types of volatility selling trades, if you like currency carry trades and the stock market volatility selling trades that were really the same things. And we started to realize that these and other carry trays were correlated with each other, and I think we felt we cracked what was going on in terms of the relationship between the growth of carry trades and what central banks were doing and how that was affecting how central bank policy operated.

Tim Lee: 07:37

Kevin and I, I think we go back a long way. We're not quite sure how we first got into contact, but Kevin had been doing sort of similar type of work and Jamie and I decided about six years ago now that we were going to do this book, and then Kevin at some point said, "Hey, you should be doing a book." I told him, "Well, we are. We've kind of recently started one." Then as a result of that, he became involved in it as well, and so the three of us did it. And I think it's ... You know I always think that, not only could anyone not have done ... I'd like to think it's a very good book, and I think that not only could any one of us not have done such a good book, I think any two of us could not have done such a good book. So, I think it was really good that it ended up as it did with the three of us working on the project.

Demetri Kofinas: 08:28

No, it's a great book and I definitely recommend for listeners to read it. It's not an easy book if you don't have some kind of a background. Though I would say if you're ambitious and you really want to learn, irrespective of your background, it's worth giving it a crack, but it has a lot of concepts that some people may not be familiar with, and one of them is a currency carry trade. Now, of course our listeners are not ... we have many people that work in finance and even the ones who don't already probably know what a carry trade is, but you mentioned a currency carry trade along with volatility selling. And, I'm curious, how do you ... explain for our listeners how do you think about and how do you use the concept of carry in this book and how does that relate to volatility selling and to carry trading in currencies?

Tim Lee: 09:17

Yea so, I think that when people think about or talk about carry trades, or if you say you look up carry trades on the internet on Wikipedia or something, it will really described currency carry trades because that's the way carry trades and finance tend to be thought about. The simple form there is, you borrow in a low interest rate currency like the US dollar or the Euro or the Yen and use the proceeds to finance an asset purchase in a high interest rate currency. Of course there are a few high interest rate currencies now, but there's still one or two like Turkey, and so buy a Turkish Lira bond or something like that. In the past, as we talk about in the book, there were a greater range of higher interest rate currencies.

Tim Lee: 10:04

We identify in the book that all of those currency systems, the Brazilian Real, Indonesian Rupiah, Indian Rupee, Chinese Renminbi, Australian dollar, New Zealand dollar, you can identify even from data as well as the work on the currency carry trade performance that those currencies were all recipients of those kinds of flows. You can do the same kinds of carry trades quite simply just in the forward markets or in derivatives. There's a lot of different ways you can

do them, but they are volatility selling trades because obviously the yield spread, say between the Australian dollar in the past when the Australian dollar did have higher interest rates and the US dollar is built into the forward prices of currency and into the swap markets and everything.

Tim Lee: 10:47 If you do that simple kind of currency carry trade, all you're really doing is betting that the currency depreciation of the high interest rate currency won't wipe out your interest rates spread. You're really making a bet that the volatility of the currency exchange rate between the high yield currency and the low interest rate currency that the funding takes place in is going to be below what the market expect. It is a volatility selling trade, and once you realize that or a short volatility trade, then you can start to understand that short volatility trades in other markets, such as in the US stock market, which we discussed in a lot of the book, such as [inaudible 00:11:29] won't be writing a put option where you gain the premium for the put option and you make a profit if the volatility of the stock market, the US stock market remains low or other volatility selling trades you can do in VIX futures, or as we outlined in the book, many other kinds of financial transactions, even in property markets, such as buy to rent property are forms of carry trade or volatility selling trade in that you're assuming that there isn't going to be a crash or a big volatility event in the market you're making the carry trade in.

Tim Lee: 12:08 Even in buy to rent property, if you do a lot of buy to rent properties and it's very popular where I'm sitting in the UK, then you're betting there isn't going to be a big housing crash because a big decline in house prices would easily wipe out the spread you own between the rental yield and the mortgage rate that you've borrowed at. We define carry trades in the book more broadly to include all these sorts of volatility selling trades, and we point out that they're all levered in the sense that if you're short volatility, you're almost inevitably risking more than the capital you put in, in the sense that it is a volatility shock if there's a big event where the asset that you're buying declines in price a lot, you're going to lose a lot.

Tim Lee: 13:00 Carry trades are levered, but they're liquidity providing. The carry trader takes the risk of there being a volatility event, a volatility shock, but he or she also is providing liquidity to the market, which in some sense is in need of the liquidity. In the case of the Turkish Lira simple currency carry trade, Turkey is a high interest rate currency, which often is kind of in need of liquidity. If you borrow in US dollars, which is a liquid funding market and then put the money into Turkey, you're providing liquidity into the Turkish market from an easy funding market. Similarly, in the stock market, if you do different types of volatility selling trade, you're providing liquidity potentially to those who are levered and may need to exit the market at some time.

Tim Lee: 14:02 If they have a margin call, I mean, if you write a put option, which is a volatility selling trade, we're saying is a type of carry trade, then you're giving lever traders the ability to hedge if they need to. If you buy the dip, which we were explained in the book is equivalent to a volatility selling trade, then you're providing liquidity to those who may need to exit the market who are levered and say, subject to margin calls. In the property market, if there's a lot of buy to let investment, buy to let we call it in the UK, buy to rent in the US, if that's very active market as it is

in the UK, then you're making the housing market much more liquid for sellers of property if they want to sell than it would be without the presence of those carry traders. We can start to see then that all of these kinds of trades of which there are many, and we argue in the book they're quite dominant in finance markets, are all carry trades. They have those characteristics of leverage and liquidity provision and they all behave in a similar way.

Demetri Kofinas: 15:09 Is the easiest way to think about this that those engaged in a carry trade, and I'm not talking specifically about currency, but increasingly everything as you describe it in the book are doing the equivalent of selling insurance. To the extent that the world remains the same or close to the same, they're going to make money. We've seen over the last X number of years, that it's become exceedingly profitable to sell insurance, and so one of the questions I have is, and feel free whoever wants to take it, is what evidence do we have that insurance or the cost of providing exposure to volatility in a very real, absolute sense is being mispriced and what are the implications of that?

Jamie Lee: 15:58 I mean, I think that's absolutely right to say that carry trades are, as we see them, these liquefying leveraged exposure to extreme skew traits are like selling insurance. What's clear is that for the last several years, there's been specifically a very large trade in financial market insurance and insurance against financial crisis type of risks, and that it's not necessarily the case that those have been mispriced except perhaps very recently, but it's definitely the case that sellers of that risk, people who receive that premium have made very large returns.

Demetri Kofinas: 16:42 Well, let me actually be more specific. What I mean is that when you include the central bank backstop as a global insurer, the risks that are being taken in return for incremental short term profits are the equivalent of the government guaranteeing, let's say insurance for homes that are on the water to flood zone. It distorts the market for insurance and encourages people to take risks that they wouldn't if that insurance had been independently priced by the market because it would have been too expensive or unavailable.

Jamie Lee: 17:14 I think you discussed this with Mike Green on an earlier episode.

Demetri Kofinas: 17:17 We may have, yeah.

Jamie Lee: 17:19 I think from the perspective of an individual speculator, from the macroeconomic sense in terms of we're talking about the US has drastically under-invested in real assets, real R and D productive capacity, and it's done a number of other odd things which seem to be detrimental to long run productive capacity. Then you might associate this with mispricing in the ultimate financial markets, and financial market insurance is perhaps the last of all markets, but it's not clear that they've been mispriced from an individual speculator's perspective over time. Obviously, they've been deeply mispriced in say February 2020, and then again in April on the outside.

Kevin Coldiron: 18:05 Demetri, this is Kevin. If I could just add one thing. I mean, maybe not mispriced, but certainly the willingness of the central banks to intervene and kind of truncate the rise in volatility and therefore truncate some of the potential losses that sellers of insurance would have experienced, it attracts more capital into these

trades, attracts more people willing to sell insurance and that's the dynamic that we describe in the book that over time, that leads to just general expansion in carry trades or insurance selling trades everywhere. I think what you're saying is right that central banks clearly have a role in kind of reinforcing the growth in these trades.

Demetri Kofinas: 18:57 Well, what I'm trying to capture is, and this is something you guys discussed in the book it's that central banks are the ultimate short volatility traders in this market. And that their increasingly active participation in supporting the provision of volatility by expanding the moneyness of assets like corporate bonds for example, by turning those assets into the central bank's liabilities, that this has exposed all of us to greater risk and has worked to amplify the carry cycle. And --

Jamie Lee: 19:29 If I can cut in briefly.

Demetri Kofinas: 19:31 Yes, please.

Jamie Lee: 19:33 Yes. Central banks are definitely not correctly pricing the risks they're taking. Of course, they're not profit seeking actors, are they? Their time is going to come to an end, I think we all know that. For individual market actors though, the risks are not so much mispriced as merely increasing because the more central banks short volatility, the higher the peaks in volatility over time will be.

Demetri Kofinas: 20:01 Maybe it would actually be helpful for listeners to have you guys answer the question of how did we get here? What is the carry cycle, how does it work and why has this become such an increasingly dominant and dangerous trend in markets?

Tim Lee: 20:21 This risk mispricing just on this is, because Jamie's talking about from the perspective of the individual carry trade and Demetri, you're already talking about from kind of the macroeconomy as a whole. I think perhaps that's the key that central banks, they have a big carry trade and as we say in the book, at some point, their own carry trade will get wiped out. The end of central banking will come one way or another. We say at the end of the book, there's two ways that could happen. One would be kind of a 2008 type experience where the central banks cannot stabilize the market.

Tim Lee: 20:58 They might do more QE and buy equities and everything, but markets just continue to implode and then their balance sheets are wiped out because by then, they'll presume they've got... The Fed's balance sheet now is $7 trillion in size, by then it might be $14 trillion in size or something by the time we get to that point. The second way, probably more likely is that in the end, with this balance sheet expansion as many people are increasingly fearing, we don't think it's coming very soon, but in the end, we may end up with a lot of inflation, which turns to hyperinflation and new forms of money will emerge, which will then start to make central banks irrelevant. We will all find ourselves using, maybe it might be some kind of a better cryptocurrency than we have today or something alternative, and therefore central banks will just become irrelevant.

Demetri Kofinas: 21:48 When you're describing inflation, you're talking about something far more significant than what we had after the end of the Bretton Woods system in the early 1970s. You're talking about a system where the fiat currencies themselves die.

Tim Lee: 21:59 Yes. Well, I think we're talking about much more inflation than we had at the end of Bretton Woods, yeah. That incense, maybe that is where the risk is mispriced at the macro level because it's hard when you think about risks that, say you are a carry trader, is there risk mispriced there? I think Jamie's saying it's not really, it's just that you get these bigger cycles with bigger crashes. I mean, it's interesting that in the book we talk about carry crashes and there've been a number, but some of them seem a bit more like corrections, like we just had in February and March. They have all the characteristics that we talk about in the book of the evaporation of liquidity across all markets or risk assets becoming correlated, the market is going straight down. That's exactly what we saw in February, March, but the markets have recovered very quickly. It is a carry crash, but it's not a major one as we saw in 2008, not as big as we saw in 2008 or indeed in 1998 when we had the Asian crisis and Russia defaulted in long-term capital management, which was a big, huge carry trader player hedge fund went bankrupt.

Demetri Kofinas: 23:12 Where do you rank that event, the event in 1997, 1998?

Tim Lee: 23:16 I think it's very important because your question there, which we sort of didn't get around to quite is, how do we get to where we are? I think that was very important in taking us into this cycle that we've come to be in because in 1998, I think it was an August, in the summer of 1998, the Asian crisis had been rolling on, Russia defaulted long-term capital management went bust, and at the end of the day, it had a lot of positions, but it was only a hedge fund, but Alan Greenspan, who was then chairman of the Fed came out and basically made it clear that the big widening of credit spreads was of a big concern to the Fed and that they were going to have to do something about it. Now at that time, the US economy was really strong.

Tim Lee: 24:06 There wasn't a good reason in terms of the behavior of the performance of the US economy for the Fed to do anything. Everything was fine in terms of the US economy, but nevertheless, the Fed acted aggressively, cut interest rates three times in quite quick succession when they weren't really particularly high given the state of the economy in the first place. Simply, it seemed because of the financial market concern simply because we were having, what we talk about in the book as a carry crash, when carry trades suddenly get a big delevering, we get a big margin call, if you like and all these carry trades start to unravel. That's what happened, and the Yen saw it because the Yen was the big funding currency at that time at the margin.

Tim Lee: 24:45 More subsequently it's been the dollar, but the Yen went straight up. There was a lot of chaos in markets and the Fed responded to that. I think that was really maybe when we went into this much more extreme cycle in carry trades and carry crashes that we've seen subsequently because the Fed's action there sent a strong signal that it was going to act to, as Kevin said earlier, truncate volatility in markets. It was going to do what it could to suppress the volatility if volatility

started to rise sharply, which means volatility selling trades which carry trades are, volatility short trade start to look much more attractive and turned what we see as a kind of natural part of carry. In the book, we explained for some time and it's various places in the book that there is a role for carry in terms of the liquidity provision role of carry, the insurance role of carry, which we've discussed.

Tim Lee: 25:47

I mean, we have to have insurers, the kind of spreading risk, providing liquidity. There's a role for that. We argue in the book that kind of central banks supercharged that, and then created this cycle of more and more growth in carry trades followed by these big deleveraging phases where you got a huge, whatever amounts were a huge margin call and everything crashes, and then they step in with more extreme... Each cycle, it seems they do things that are more extreme than the previous cycle and then kickstart the carry trades again. What happened in 1998, I think was very important. I think some of us saw it at the time. I don't want to blow my own trumpet, but I was working at Invesco at the time, the big mutual fund. I remember one or two people there. I mean, not everybody saw the what the Fed did there was appropriate. Some of us, I feel recognized those dangers at the time and I think that's been born out, I would argue at least.

Demetri Kofinas: 26:44

If my memory serves correctly, the LTCM folks were banking on spreads between Russian bond yields and US bond yields or Japanese bond deals to begin to narrow, not to continue to blow out. They were banking on mean reversion, and this is a phenomenon that we've seen increasingly dominate investor psychology in the last X number of years, which is that investors consistently expect that every time there's a dip, they should buy it because markets always mean revert. I was sitting around thinking about what are the other phenomena that I think are consistent with this, and I think declining levels of volatility, obviously it's something you've talked about, also diminishing returns on capital, the lower yields are an aspect of this, increasing correlation across assets.

Demetri Kofinas: 27:34

In fact, the correlation I think is interesting because when you guys talk about liquification or the increased moneyness of assets, the fact that more and more assets are beginning to act like money because the Fed and central banks are backstopping and insuring those assets. It feels like at the limit, what central banks have done and governments have done and what they are doing is they are increasingly making every asset the same. They're decreasing idiosyncrasy across assets and making everything one giant homogeneous market, which is ultimately insured by governments and central banks. At some point, the governments and central banks, and I think this is what you guys are saying are no longer able to act as global insurer. At that point, their credibility is shot and the system has to reset. Is that your overall thesis, and if not, can someone please explain how it's different?

Jamie Lee: 28:28

That's more or less exactly right. We all risk asset markets these days. Statistically, this is actually slightly less true now than it was a small handful of years ago, but stylized, all the risk asset markets these days trade based on the overall global liquidity factor, rather than based on their own idiosyncratic merits. Pointing to 1998, when the US Central Bank intervened in US money markets by cutting rights to, as a result, indirectly of problems in Asian currency markets because it had to help out its own financial intermediaries here in the US. I mean, it's easy to see how this is directly a key link in the unification of global markets.

Demetri Kofinas: 29:22

Kevin, I want to give you a chance to say something, if you like, and you can feel free to respond to what I'm about to say, or jump on what we were talking about before. I do want to continue with this point about the carry cycle because I would like to know what were the most significant moments. 1998 is one of them, obviously 2008 is another. I'm curious if you have any other. Also, for listeners, I mentioned finite time singularities on an episode we did on this, which was with the founder of the high energy physics group at Los Alamos National Laboratories. That was episode 19. We talked about this and how you basically, every time you hit a finite time singularity, you have to cross that chasm. The analog, I think in the case of financial markets has been for the federal government and central banks stepping in and bridging that gap by dousing markets with liquidity. I'm curious to see, of course 1998 was a government engineered private sector bailout of the investment banks that were basically backing LTCM or had counterparty exposure to LTCM to prevent contagion, but what other examples can you point to? What are some material examples of how this has resulted in some of the additional phenomenon that we have seen, like lower interest rates, like narrowing spreads, like diminishing returns on capital, et cetera?

Kevin Coldiron: 30:40

Tim alluded to at the beginning that neither one of us can exactly remember when we met, but I'm pretty sure it must have been just after 2007, 2008. One of the events that really triggered my interest in this actually was the summer of 2007. I don't think the summer of 2007 actually gets as much attention as it deserves in terms of what you call it a seminal event in kind of the carry cycle. At the time, I was running quite a large multibillion dollar long short equity book, right? It's very balanced, we're long and short kind of roughly the same amount. We're trading in 25 markets around the world. In the summer of 2007, that's when the mortgage market really started melting down. If you remember, there were Bear Stearns, hedge funds that ran into problems.

Demetri Kofinas: 31:33

BNP Paribas.

Kevin Coldiron: 31:35

Exactly, and then BNP Paribas, money market funds. We're watching this and we're aware of all these problems, but we've got a book that fundamentally ought to be entirely different from that. The fundamental risks of a long short global equity book shouldn't really be related to the mortgage market or a French money market fund. What we found is that starting at the end of July and then accelerating in August, there was basically a bank run in our particular corner of the market. There was drawdowns that day after day were five, 10 times greater than what we've ever seen before, ended up wiping out a bunch of our competitors. Goldman Sachs had a big fund that had to get bailed out. What we realized ex-post after the fact is that there was a range of actors who had exposure to, say mortgage markets, their money got trapped in those funds.

Kevin Coldiron: 32:36

They couldn't get access to liquidity, so they accessed liquidity by taking money out of strategies like ours, which were more liquid. That created enough downward pressure on our positions that risk management started kicking and saying, we need to reduce leverage, which then forced more downward pressure on positions and this kind of self-reinforcing cycle developed. Basically, liquidity demands or liquidity concerns in one corner of the market infected or transmitted to something that fundamentally should be completely uncorrelated. That's when really the light went off in my head that this demand for liquidity, especially

if you're levered, ties everything together. If you look at the world, as it existed, say, when Tim was talking about 1998, hedge funds were really bit players. That's when I started managing hedge funds. They were basically relatively small pools of capital for wealthy investors.

Kevin Coldiron: 33:38 They weren't institutionalized huge players they are today. Over that period, the last 25 years, hedge fund assets have grown by at least 25 times. In fact, a lot more than that because they apply leverage. Their impact on the market orders a magnitude greater than it used to be. Hedge funds are levered, therefore they're demanders of liquidity. As that industry has expanded, the demand for liquidity provision has gone up dramatically. Therefore, as Jamie was alluding to, the return to providing that liquidity should also go up. You, Demetri said, "How did we get here?" One of the ways we got here is through this just tremendous growth in the hedge fund industry. I'm not blaming the hedge fund industry for the carry cycle. It's just its natural evolution has contributed to it really quite meaningfully

Jamie Lee: 34:35 If I can just take a step back, we've focused a lot until now on the role of central banks in amplifying this rise of the carry cycle, but at the highest level, the world economy uses far more leverage as far higher levels of debt compared to aggregate wealth of debt compared to aggregate outputs over the last decade or two than there were in the immediate post-war era or any time previous for which we have good statistics. More liquidity provision is needed, more carry trading is needed when there is more leverage. Leverage began to rise in the 1980s and to a much higher level than it had ever seen in recorded history before. Then on top of that, we have much more focused kind of points of high leverage, such as Kevin's talked about the increasing role of hedge funds or today, if you want, you might talk about the role of retail option buying, which is often very highly levered, and that amplifies this a lot more.

Demetri Kofinas: 35:46 Obviously the private sector is... This gets us into, I think what is a general amount of confusion among many who attempt to understand how monetary policy works and the role of the private sector versus central banks. Again, this brings us back to the key thing I keep trying to emphasize, which is that the presence and up to until now credibility of government actors and primarily central banks as liquidity backstops and providers of liquidity of last resort has encouraged private sector actors like hedge funds to take on such large amounts of risk. To go back to something Kevin was saying, 2008 through the eyes of your framework was basically a reversal of the carry trade, correct?

Jamie Lee: 36:35 Yes.

Demetri Kofinas: 36:37 How significant were the bailouts of 2008 and the response of government officials to what we're seeing today to the sluggish growth? The other thing it's I think people often think of these lower interest rates, they think of it as a choice, that central banks have a choice at this point in terms of keeping rates low, but I would argue and I think you would argue it as well based on having read your book that we're kind of caught now in you could call it a liquidity trap, that's the technical term, but central banks are basically hostages. You guys actually, I think say this in the book, and I really love this, which is they, at first, they were enablers, but now they're hostages. They're in the car and there's a gun to their

head and they're driving the car and they don't really have a choice because if they don't do what the people with the guns tell them to do, we're all going to die, but if they do what they want, we're all going to die anyway, or if they did something differently, we're all going to... I mean, we're sort of past the point of no return, and I wonder if you guys can speak to that. I know that was a lot, but whoever wants to, Kevin, Jamie, Tim, whoever wants to take it.

Tim Lee: 37:45 I think that's right. I think that, yes, if we go back to the mispricing risks, we can say that maybe from a macro point of view, it's the central banks where that's where the mispricing of risk is if you like, but we have ended up with a situation of asset prices becoming disconnected in a way from the real economy, if you like. That obviously can't be sustainable forever, but it's gone on for some time, and we do disagree. I mean, in the book, I guess it's quite clear that what we say disagrees with one or two of your previous guests, I think who would take the view that a problem is that we have a surplus of savings. I think that-

Demetri Kofinas: 38:33 You're talking about the Michael Pettis episode.

Tim Lee: 38:36 Yes, I guess in particular, but that's a quite common view. Obviously, Ben Bernanke, the Fed have, I think fairly consistently believed that that's the case, but as Jamie was saying that we're in a world, which in some sense, carry at some level is essential because we have so much leverage and so much debt. We think we have very high levels of systemic leverage, but of course the carry, it's a circular thing. The existence of the carry, if you like there, the reinsurer, the central bankers as the reinsurer encourages more leverage, but then as we have more leverage, which is associated with more debt when leverage and debt are not exactly the same thing. We try to explain that a little bit in the book, but obviously there's an association between leverage and debt. A lot of leverage trades and transactions do involve debt in a straightforward way. Not all do, but we have more debt-

Demetri Kofinas: 39:28 That the world itself is more indebted and that the surplus savings phenomenon is simply a result of the fact that we've increased global leverage.

Tim Lee: 39:35 I don't think we have a surplus savings in a meaningful way. I mean, that's really what we say in the book. You can argue that in some sense, there's more savings than the funds required for investment to provide a decent return, but I think that the problem really is that there isn't really much demand for real investments in the economy if you like. These things are really circular, but I think that the excess of debt and the access of leverage acts against the desire for investment in the real economy and the higher asset prices that are courage by this whole process of carry and leverage encourage more consumption at the expense of investment.

Demetri Kofinas: 40:25 And with suppressed yields.

Tim Lee: 40:27 Yes. The simple kind of macro savings models that I've done in my own work, and I think that probably others find the same show that for most economies, if wealth is higher, financial wealth, if you like, wealth in the sense we think about it, not wealth in the sort of real economy sense, but financial wealth, the amount of assets people think they have is higher, then savings tends to be lower because

if people think they've got a lot of money to put it simply, then they tend to save a little less.

Demetri Kofinas: 41:01 This is also an interesting phenomenon though too as well, right? I mean, most Americans today consider their stock market holdings as their savings, and this goes back to the point about liquification and the increasing sense of moneyness.

Tim Lee: 41:14 It does, and that's quite common. Even reading work by macro economists or financial economists, they often treat a rise in stock market values as being the equivalent of savings, but it isn't really. Real savings is what is set aside out of income. It's really the resources that are set aside to do investment in the real economy. I mean, the fact that Tesla's market cap has just gone up by another $100 billion or whatever doesn't set any resources in the economy aside for real investment.

Demetri Kofinas: 41:47 Also, the tail is now wagging the dog, right? I mean, capital markets is supposed to be an important integral mechanism in a capitalist economy for allocating wealth and basically overall growing the economic pie and creating real wealth over time, but now it's sort of reversed itself. I mean, this gets to the heart of something that I really want to make sure we touch on when we discuss, which is, is the carry model fundamentally incompatible with growth long-term?

Jamie Lee: 42:16 No. Carry trading is required for growth. I mean, obviously insurance is required, obviously liquidity is required, but what it seems is that whether fundamentally or not, perhaps leverage has become so extreme that the demand for liquidity from levered actors outweighs the demands for real productive investment. I mean, suddenly it seems that from an individual's perspective, you are better off investing your own resources in carry trading than you are in real production. For example, famously companies would rather do financial engineering than actually make investments, and that's the kind of key. That is the critical example of this. Carry has reached a point where it seems to be crowding out the real economy and things like the reversal of the link where asset markets now cause the economy rather than vice versa are parts of that.

Tim Lee: 43:18 Yeah, I think that's right. That comes back to this idea that perhaps I wasn't explaining very well that we really have deficient investment, but for the world as a whole savings and investment are the same thing, for the world as a whole. They aren't for an individual economy necessarily because you can have capital inflows, any economy can draw on the savings of another economy, but for the world as a whole, savings and investment are the same thing. The idea that there's a surplus of savings is, I think very misleading from that point of view and the book we really say, I think we say that there's a deficiency of savings, meaning there's not enough real investment and it's too much consumption. It's really investment that drives growth in the end.

Tim Lee: 43:59 Some people think it's consumption, but it really can't be. I mean, consumption is consumption. You're consuming the resources, not setting them aside for investment in the future. There's a variety of reasons that are connected to this sort of carry, we call in the book, the carry regime where you have the kind of supercharged carry cycle of carry expanding more and more and more than a crash, and then you kind of repeat it again. The carry regime is really associated

with the trend economic growth rate going down over time, and that's rarely associated with a deficiency of savings and investment. I would say I don't think the empirical evidence really supports the idea that some kind of surplus of savings as obviously is in China and we could discuss that, but a lot of those savings are misallocated.

Tim Lee: 44:48 Once you look outside China, not very recently because of all these distortions caused by the Coronavirus, but what we've really seen from many Western economies and even quite a few major developing economies or emerging economies, that's just Brazil and Turkey is savings rates being on the low side, not high. I don't think you really see the empirical evidence is a surplus of savings. What there really is, is not enough investment going along with that, not enough savings and declining trend growth rates over time. I think that's very important to understand because it means that the equilibrium level of interest rates is low. People are saying right now in the markets, the Fed are now going to commit to having interest rates much lower for much longer, and that's all very positive, but really how much control do they have over that? I mean, the reality is the equilibrium level of interest rate is already very low, maybe very close to zero because trend growth rate is close to zero. They don't really have the ability to raise rates a lot, even if they wanted to.

Demetri Kofinas: 45:53 How does this phenomenon explain the low growth rate that we've seen in the US, in the Eurozone and in Japan going back even longer than us?

Tim Lee: 46:02 I think it's because of what we're saying that there's not been sufficient savings. It's quite hard to understand because it's a very dynamic process involving a lot of different elements. As Jamie was saying, companies have found that they get more bang for their buck by doing financial engineering, share borrowing and doing share buybacks than doing actual investment [crosstalk 00:46:27] when you get returns from carry trades that seem higher than you can get out of investing in the real economy. That will be a tendency there, but individuals are thinking, we've got a big 401k. We don't need to really save much now because of asset price inflation. You're getting the sort of low savings and low investment go along with each other, and that's being associated with low real interest rates.

Tim Lee: 46:52 That further encourages along with central bank action to carry trade, the kind of more rapid growth of carry trades and would otherwise be warranted because you ended up with a low level of nominal interest rates. These things all go together. I think what a lot of economists get wrong is, in my view, my personal view is they think about savings and investments in a very static way because when you do economics at university, you kind of draw your graph of the sort of use of funds and supply of funds. Your typical kind of the X and the Y axis and the line going from top left to bottom right and line the other way around. That's a very static model. That's sort of saying if saving suddenly jumps, then you'd expect real interest rates to drop because there's suddenly a surplus of saving.

Tim Lee: 47:43 What we're talking about when we talk over periods of years, you've really got to think about the dynamic, all this dynamic things that are going on, which is some of which we're talking about in the book. I think they're pointing to the fact that investment is too low, real investment is too low, real savings are too low, and along with those things, real interest rates are too low relative to some kind of

more normal equilibrium, which we didn't have this kind of supercharged carry phenomenon, though we call the carry regime. I mean, Jamie's pointing out that there's some level of carry and we make the point very strongly in the book, some level of carry is inevitable and necessary really, and we've always seen that. There's always been a return to doing carry trades, which is necessary and that there's a necessity for risk pooling for insurance, even for providing liquidity to developing economies that need that liquidity to produce the growth that they're capable of doing. We're not arguing that carry, as we describe it is in across the board, bad thing, what's bad is the supercharging of it, which has become a kind of vicious circle of bigger and bigger carry expansions and carry crashes, which is what we're seeing.

Demetri Kofinas: 49:00 When I talk about that, what I mean is in a world where you have an unrestrained short vol seller in the form of central banks that can generate the currency upon demand, can spring it into existence and liquefy markets on command, that in such a market at the limit, once you get beyond a certain level of leverage, it becomes an unsustainable model. That's kind of what you're saying, right?

Tim Lee: 49:25 Yeah.

Jamie Lee: 49:27 That is what we believe, we will say. For what it's worth, it's worth considering that global population growth rates, which are a major determinant of global growth rates began to fall before all of this, before even the 1987 crash, which was the very beginning, the kind of prologue to all this. It's plausible that this isn't the central bank's fault as it were, that all of these forces were put into play long before they ever came and made it all bigger and worse with their interventions in 1998 and 2008.

Demetri Kofinas: 50:02 We're going to move it to the overtime in just a bit. Kevin, I want you to have a chance to say something before we go there. I do think the big story here for me, and we'll talk about one of the things I also want to discuss is the role of the dollar and other fiat currencies, their viability and you mentioned cryptocurrencies, what role maybe private sector competing currencies may play. For me, the single biggest story here is the viability of governments, legitimacy of governments as perceived by the populace and the viability and legitimacy of central banks. I think that because of, like you say Jamie, certainly this is not all on central banks. It's not all the fault of central banks, so to speak. There are many forces at play, but I think because central banks and governments so abused their mandate, in my opinion, they have wrecked their credibility and their legitimacy in just the time where we need that legitimacy and that credibility. Kevin, feel free to tell us your thoughts because you haven't had a chance to speak much and then we'll switch it into the overtime.

Kevin Coldiron: 51:10 Sure. I was thinking actually earlier about this idea of central banks and central bank independence, and it's actually a relatively new phenomenon. I mean, when Tim and I started our career, most central banks were seen as really just an agent of the central government. They didn't have independent mandates. It was really just the Bundesbank and the Federal Reserve that were independent. It was gradually kind of... Two things changed. One is that there was this kind of view that governments had this inflationary tendency and that you needed to make central banks independent in order for inflation to trend lower. Two, there was a

desire for greater international capital mobility, capital flows, and it was felt that independent central banks could promote kind of freer capital markets.

Kevin Coldiron: 52:07 When you think about those trends, the trend of central bank independence has happened kind of at the same time that the carry regime has expanded, and really low inflation and capital flows really benefit the finance industry. They're not directly beneficial to, if you will, kind of real people, the working class. Central bank's independence has really been, in some sense, a vehicle to promote finance, and you could argue at the expense of the real economy. I wouldn't be surprised if we start seeing that central bank independence get rolled back if it's starting to look like they're not really doing anything, but kind of bailing out the finance industry. They're reinforcing wealth and equality. I think the first step we might see is governments deciding to kind of take back control, and that could be the impetus for the beginning of inflation, which we talked about in the book might end up changing the carry regime long-term.

Demetri Kofinas: 53:12 Would you say that that has contributed to making our finance more extraordinary where you see things like companies borrowing money to buy back their shares rather than making investments that grow their long-term profitability?

Kevin Coldiron: 53:25 Yeah, absolutely. I think the airlines are particularly good examples or bad examples, depending on your perspective of that, where the CEO's have done exceptionally well out of option and stock grants and the returns to equity holders and the job security, the individual workers hasn't been there, but the people who are in control of the capital have done really well out of that. That has a lot to do with being able to issue debt and buy back shares, which is kind of key element of the carry regime. I do think it's contributed to this kind of view of finances now being more extraction area than just providing general liquidity services to everyone.

Demetri Kofinas: 54:12 Well, as I said, guys, I'm going to move the rest of our conversation into the overtime. For anyone who is new to the program, Hidden Forces is listener supported. If you want access to the rest of this conversation as well as the transcript to today's episode and the rundown, which is excellent this week, I've got a number of quotes from The Rise of Carry, which I strongly suggest that listeners read. I don't often implore people to get books, but I think in this case, it's an excellent book. I would add that to your list as well. There is a link in the summary page to this episode with instructions on how to connect the overtime fee to your phone in case you haven't done that, and there's a link in the summary section to the Hidden Forces Patreon page, which for you listeners is patreon.com/hiddenforces. Guys, stick around. I'm going to move the second half of our discussion into the overtime.

Kevin Coldiron: 55:05 Great, thanks.

Demetri Kofinas: 55:07 Today's episode of Hidden Forces was recorded in New York city. For more information about this week's episode or if you want easy access to related programming, visit our website at hiddenforces.io and subscribe to our free email list. If you want access to overtime segments, episode, transcripts, and show rundowns full of links and detailed information related to each and every episode,

check out our premium subscription available through the Hidden Forces website or through our Patreon page at patreon.com/hiddenforces.

Demetri Kofinas: 55:44 Today's episode was produced by me and edited by Stylianos Nicolaou. For more episodes, you can check out our website at hiddenforces.io. Join the conversation at Facebook, Twitter, and Instagram @hiddenforcespod or send me an email at dk@hiddenforces.io. As always, thanks for listening. We'll see you next week.