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Extraordinary popular solution: funding from crowds?

“Crowdfunding” allows early-stage companies, projects, and artistic ventures in the US to attract financing from the masses over the Internet and provides developing world microfinance initiatives a new avenue to secure capital. To date, crowdfunding has provided more than \$500m for enterprises or ideas normally unable to raise money even from venture investors by aggregating funds from thousands of motivated and unaccredited individual investors. With the recent passage in the US of the JOBS Act, this novel method of financing stands to grow rapidly. Given the often small, distributed nature of clean energy development, a small, distributed financing model holds real potential though there are potential pitfalls as well.

- Crowdfunding is an investment vehicle that works in reverse – retail investors can determine which projects are brought to market and what information they require on a continuing basis. Crowdfunded clean energy projects could substantially upend today’s relationships between non-accredited investors and project developers, term lenders, institutional funds, and venture capital.
- Crowdfunding could take a substantial venture investment role similar to existing angel and seed-round players – but with virtually no protections for early investors.
- Asset investments sourced through crowdfunding can be used in place of construction debt and term debt. However, there are potential limitations. Even if crowdfunded asset finance is senior debt, it will require both insurance products and a secondary market in order to be a large, robust, and transparent investment mechanism.
- Energy asset crowdfunding resembles energy cooperatives and third-party finance, but it creates two fundamental breaks in those existing structures: it allows cooperative investment without direct participation in energy use, and it allows non-accredited investors to be active third-party financiers.
- This unique financial mechanism relies not just on investor interest, but investor engagement and even emotion. Crowdfunding aggregators and arrangers will need a relationship with their investor-clients, rather than just a transaction with them.
- The most visible player operating in the nascent space of clean energy crowdfunding is Solar Mosaic, which has just raised \$2.5m in venture capital. Others include Abundance Generation in the UK, and SunFunder in the US.
- In the past decade, retail investments have been both risky and low yield. Even very small fractions of the trillions of dollars in retail investment capital would provide ample dollars for crowdfunding clean energy. 1% of current retail investment in savings accounts, money markets, and US Treasuries would provide more than \$90bn in clean energy crowdfunding.

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1. CROWDFUNDING STRUCTURES

1.1. How it works

Crowdfunding is a direct investment mechanism connecting motivated individual investors to projects which interest them via a clearinghouse or aggregator. Usually, crowdfunding placements are small – several hundred dollars but sometimes much less – and those seeking funding often need many investors to reach their capital targets. Investors can receive either structured payments, products, or some combination of the two in return for capital.

Two very successful crowdfunding companies are [Kickstarter](#) which specializes in creative projects, and [Kiva](#), a non-profit which lends as little as \$25 for projects alleviating poverty in the developing world. Both offer lessons for clean energy crowdfunding, which will be explored later.

1.2. The JOBS Act – caveat investor

Crowdfunding has been growing without legislation for several years, but has received a boost from a rare piece of bipartisan legislation, the Jumpstart our Business Startups or JOBS Act which President Obama signed into law on 5 April 2012. The act is designed to allow unaccredited investors to easily make equity investments in small or start-up businesses, particularly through crowdfunding.

The bill authorises companies to sell as much as \$1m per year in securities to two classes of investor: (i) those with less than \$100,000 in yearly income, who can invest up to either 5% of annual income or \$2,000 (whichever is greater), or (ii) those with annual income above \$100,000, who can invest up to 10% of income or up to \$100,000. Importantly, the legislation also exempts crowdfunding from normal Securities and Exchange Commission caps on shareholders – meaning that companies that might have been forced into public disclosure by reaching 500 shareholders can remain private.

This legislation substantially increases the potential pool of angel investor capital for all entrepreneurs. However, it creates substantial risks for equity crowdfunding investors as well.

2. FUNDING THE NEXT STEVE JOBS, OR THE NEXT MADOFF?

Investors with deep venture capital backgrounds are generally sceptical of equity crowdfunding. With the removal of regulatory barriers to unaccredited investment, they say, comes greater risks.

Most professional investors who have voiced an opinion on equity crowdfunding have been sceptical at best. [Mitch Lowe](#), an angel investor and the founder of San Francisco-based incubator Greenstart, says that only a very structured investment could provide returns along with some security. Lowe suggests that revenue financing, which allows investors to receive a percentage of a company's revenue until a certain overall return has been reached, could provide clarity on returns, if not on return horizon.¹

Business school professor [Daniel Isenberg](#) highlights three issues with equity crowdfunding: the difficulty (or impossibility) of standardizing the investment process; high due diligence costs, and the perils of group irrationality, or the fact that "[crowds are stupid](#)." He quotes a "savvy tech entrepreneur" as saying "I love crowdfunding: it is cheap money for me. I know it is not good for the investors." He concludes that equity crowdfunding "will effectively tax well-intentioned

¹ Interview with Mitch Lowe, Greenstart. 24 April 2012

With the removal of barriers to unaccredited equity investment comes greater investment risk

A greater pool of investors dilutes the average expertise of each angel investor

consumers to the benefit of well-intentioned entrepreneurs and well-intentioned crowdfunding sites, supported by our well-intentioned government.”²

Venture capitalist [Esther Dyson](#) looks askance at the lack of regulation in equity crowdfunding, saying “[without regulation, bad people take advantage of the good ones.](#)” She adds that a greater pool of investors also dilutes the average expertise of each angel investor and potentially reduces the number of companies in each individual angel portfolio, with “inadequate diversification leading to many more losers than winners.”³

Early-stage seed venture investor [Chris Dixon](#) raises yet another issue for equity crowd fund investors: lack of protection from dilution when larger professional investors make follow-on investments. He [highlights](#) a number of scenarios in which early-round investors – whether professional or not – would find their investments massively diluted if not eliminated entirely. He concludes that protections “are very complicated and difficult to execute in practice, even when the small investors are ‘professional’ investors. I worry it will be even harder for ‘amateur’ investors to protect themselves.”⁴

Others are more direct still. Columbia University Law Professor John C. Coffee said that one of the JOBS Act bills “might as well be titled ‘The Boiler Room Legalization Act of 2011’” for its very slight investor protections.⁵

3. CROWDFUNDING FOR CLEAN ENERGY – DEBT IS THE DEAL

Clean energy crowdfunding is much more of a debt play than an equity play

With equity crowdfunding for corporations offering such low investor protection, asset financing using crowdfunding seems a safer position for retail investors. To put it another way, clean energy crowdfunding is much more of a debt play than an equity play.

When crowdfunding enters the asset finance capital pool, it will do so in ways similar to construction and term debt. However, it will carry with it two significant changes for investors themselves. First, debt crowdfunding breaks the physical connection between retail clean energy investors and onsite use of energy. Second, it allows retail investors to participate in third-party financing.

3.1. Breaking the retail bonds

It is already possible for retail investors to participate in clean energy projects. Electrical cooperatives and so-called “solar gardens” already use retail capital for clean energy investment. However, they do so with a direct connection between investor and project. Retail cooperative investments are limited to the coop members who receive electricity from their own generation, transmission, and distribution. Solar gardens serve a particular community and are invested in by that community – again maintaining a connection of direct use between investor and energy asset.

Crowdfunding however allows retail capital to invest in a project to which the investor has no electrical connection. Investors can crowdfund an asset in a different electrical service area or eventually, even in a different country.

3.2. Third party finance goes retail

Existing third-party finance mechanisms, such as those used by Clean Power Finance, SolarCity, and others, allow investors to participate in projects without receiving energy output. However,

² The Road to Crowdfunding Hell” http://blogs.hbr.org/cs/2012/04/the_road_to_crowdfunding_hell.html accessed 24 April 2012

³ “Markets of Magical Thinking” <http://www.project-syndicate.org/commentary/markets-of-magical-thinking> accessed 24 April 2012

⁴ “The risks of being a small investor in a private company” <http://cdixon.org/2012/04/25/the-risk-of-being-a-small-investor-in-a-private-company/> accessed 30 April 2012

⁵ Statement of Professor John C. Coffee, Jr., Adolf A. Berle Professor of Law, Columbia University Law School, at hearings before the Senate Committee on Banking, Housing, and Urban Affairs, Dec. 1, 2011, Washington D.C.

these mechanisms are only open to financial institutions, particularly as they rely on sophisticated financial engineering and require tax equity investment as well as debt.

One key SEC rule that pre-dates the JOBS Act may allow crowdfunding arrangers to enter into larger financing vehicles. The first is known as a "Regulation A Exemption" which allows the SEC to exempt any class of securities if the exemption is in the public interest. Presumably, clean energy assets could be considered in the public interest and therefore exempt. The JOBS Act has expanded the yearly cap on such investments to \$50m per year per security.

Crowdfunding allows retail investors to participate as third parties in clean energy projects, primarily by investing in the fashion of construction and/or term debt, with structured payments and some degree of protection for investors.

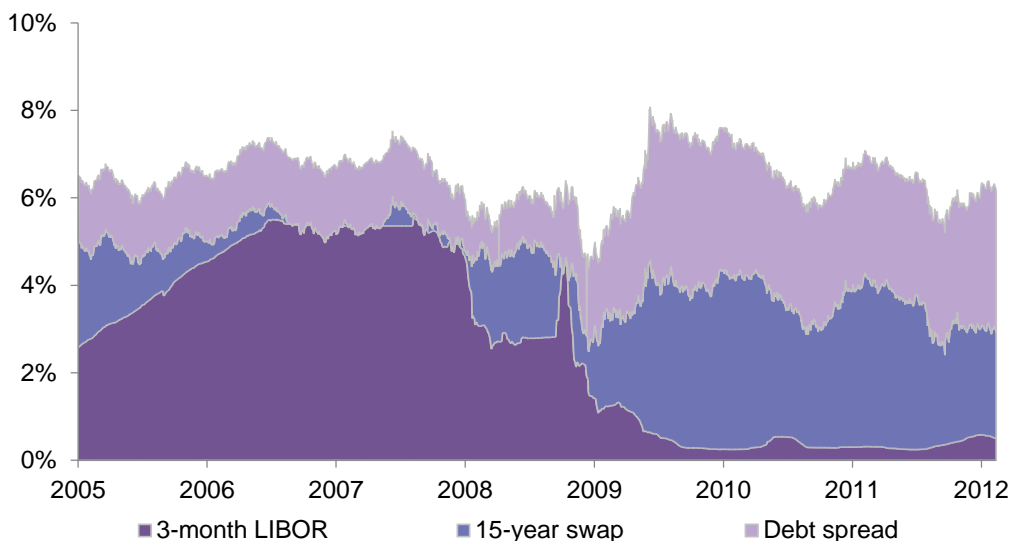
3.3. Debt rather than equity...

Crowdfunding for asset investment will most likely resemble construction debt and term debt. [Abundance Generation](#), a UK-based developer and hopeful asset owner, plans to sell 20-25 year debentures in units of £5, which investors can then sell on via a bulletin board if they need liquidity before the debenture's term has finished. Abundance says it expects returns of 5-9%. In April, [Solar Mosaic](#) filed with the US Securities and Exchange Commission to offer "Solar Power Notes to the public, with proceeds going to fund solar power projects." The company is in a mandated quiet period and cannot comment on returns, but its Notes will function essentially as term debt for solar projects.

Crowdfunding would not disrupt the rest of the usual project development process; it simply provides capital in lieu of term financing sources once a project is viable. Some crowdfunders, such as Abundance Generation, plan to develop their own projects; others such as Solar Mosaic will invest in projects already under development. Some crowdfunders specialize in the developing world. [SunFunder](#), which is planning to crowdfund investments solely in the developing world, will offer a portfolio of projects it has selected for investment, and [Green Ocean Ventures](#) offers microloans for solar systems solely to women.

Crowdfunding which yields 5-9% would provide a favourable return for investors compared to other retail investment options, which will be discussed below in detail. The top of that rate range, however, would price crowdfunded debt higher than term financing for utility-scale wind assets in the US today (Figure 1).

Figure 1: US wind asset finance debt "layer cake", 2005-2012 year to date



Source: Bloomberg New Energy Finance

Debt and debt-like crowdfunded clean energy investments are expected to yield 5-9%

At the top end of a 5-9% range, crowdfunded debt would be pricier than US utility-scale wind debt financing today

If crowdfunding is to expand substantially, it will likely require credit risk and insurance products designed to protect investors...

...and a robust secondary market to allow liquidity before investments have reached term

3.4. ...but what of development and credit risk...

Crowdfunding would not in any way offset project credit risk. However for early investments, this may not be an issue as investors are likely to be motivated as much by environmental and social values behind a project, and frustration with existing financial institutions, as they are with riskless returns.

If crowdfunding is to expand substantially, it will likely require credit risk and insurance products designed to protect investors. Such products exist for projects already, and there is a healthy ecosystem of insurance and reinsurance companies which could provide the instruments required.

3.5. ...and what of a secondary market?

A healthy long-term crowdfunding market will probably require a secondary market for crowdfunded debt. While crowdfunding can be a savvy and cleverly engaged platform for sourcing capital, it may not remain the perfect mechanism to retain asset investments.

In that instance, crowdfunding would greatly benefit from a robust secondary market of institutional investors willing to own debt – or even own assets outright – and continue to pay returns to investors. A secondary market, too, would allow for investors to exit before the end of their original investment term, for instance when approaching retirement and in need of substantial funds. Without a substantial secondary market, crowdfunding will remain a mechanism only for those investors with sufficient belief in their specific investments, and a willingness to accept long tenors. Such investors would be a very small minority of the total available retail funds, and crowdfunded debt would not be likely to have much impact.

The JOBS Act requires investments to be placed through a broker-dealer, so theoretically the mechanisms for a secondary market are in place. However, secondary markets are not guaranteed. The argument is circular: with a small pool of investors, there may not be enough liquidity to support a secondary market. Without a secondary market, there will be no liquidity events for investors and therefore a small pool of investors....which prevents a secondary market.

4. CROWDFUNDING INVESTOR BEHAVIOR

Crowdfunding breeds a different type of client-manager relationship than the one prevalent today between retail investors and professional fund managers.

4.1. Qualitative, not just quantitative

All investors demand quantitative information. However, with a mutual fund or indexed investment, there is no inherent engagement with an investment. To most retail investors, the information available on an investment is simply an indication of value and change in that value. It is entirely a quantitative relationship.

Crowdfunded investors do not just demand quantitative information, they demand qualitative information. Qualitative information is necessary to create an investment but also to *engage* with it. It means a relationship with the information of that investment: its status (open or closed), its performance, its term, its specific recipients, and its ultimate goals. Retail investors are not usually excited when a mutual fund is fully subscribed. Crowdfunded investors can be excited when their investments close.

4.2. Empathy

Qualitative engagement also places a premium on empathy. Crowdfunding investments require more work, in a sense, than does buying an exchange-traded fund – but they also offer an

Micro loans “have an emotional resonance in the transaction cost”

intrinsic reward which can be enhanced with a skilful, emotionally resonant, empathetic engagement.

[Premal Shah](#) is the President of [Kiva](#), the San Francisco-based microlender with more than \$300m lent to nearly 400,000 people and projects in the developing world. In an interview, he pointed to the fact that loans of the sort that his company offers have “an emotional resonance in the transaction cost”.⁶ This is seen not only in Kiva’s loans, but in the engagement of funders in the creative projects crowdfunder [Kickstarter](#). The [Pebble](#) watch, for instance, drew exceptional interest thanks not only to product, but an engaging story presented via short video clip. The Pebble is currently the most-funded Kickstarter project ever with more than \$10.3m raised from nearly 69,000 backers – giving it 10,000% more funds than its creators were seeking through the platform.

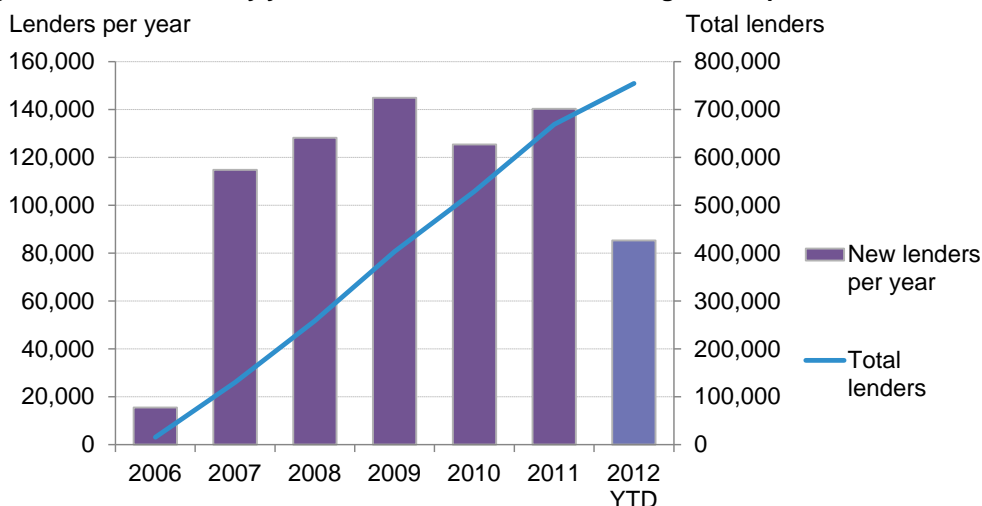
Kiva’s and Kickstarter’s sites are not so much information as they are experience. Compare them to websites for leading US independent power producer [Caithness Energy](#) or investor-owned utility holding company [MidAmerican Energy Holdings Company](#).

4.3. Growth

As the Pebble story suggests, crowdfunded investments in a particular project can grow very quickly. Crowdfunding platforms can also grow quickly, as data from Kiva attests (Figures 2 and 3).

The number of Kiva lenders has grown at a 55% CAGR since 2006

Figure 2: Kiva lenders by year and cumulative since founding, 2006-April 2012



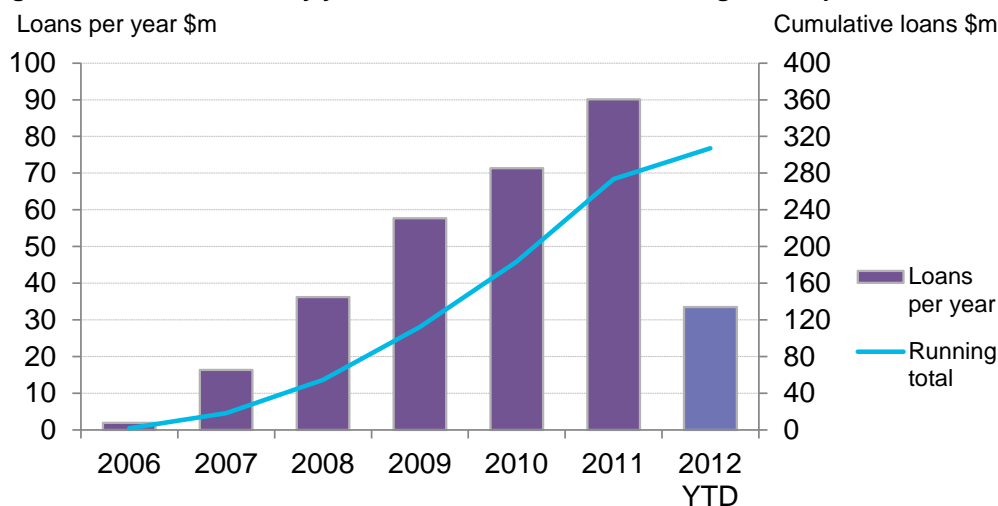
Source: Kiva

⁶ Interview with Premal Shah, 1 May 2012.

Kiva's new lenders have grown at a 55% constant growth since founding in 2006. It now has nearly 800,000 lenders. Total loans have grown at an even more rapid rate: 115% CAGR over the same time.

Total funds committed have grown at a 115% CAGR

Figure 3: Kiva total loans by year and cumulative since founding, 2006-April 2012



Source: Kiva

4.4. Stickiness

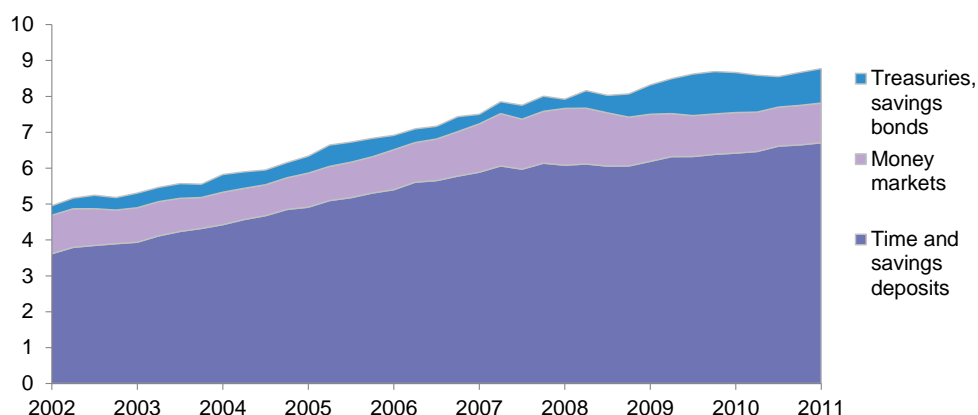
Kiva's and Kickstarter's data points to one other attribute for crowdfunding investment: stickiness. Their funders return multiple times to fund multiple projects or loans. These qualitative, empathetic platforms not only attract investors, they retain them. A successful experience for crowdfunding investors does at least follow one maxim from traditional project finance lending: while a select few institutions will finance a first-of-a-kind project, "everyone wants to finance the second one."

Kiva loan values have increased at a faster rate than new lenders have enrolled

5. RETAIL INVESTMENT VEHICLES AND RETURNS

If clean energy crowdfunding is to grow into an asset class, how does it compare to other retail investments?

Figure 4: Household holdings of selected retail deposits, 2002-2011 (\$trn)



Source: US Federal Reserve (last published update 8 March 2012)

Even in a difficult economic landscape, there is no fundamental lack of capital in the US. US retail investors hold nearly nine trillion dollars in Treasuries, savings bonds, money market funds, and time and savings deposits (Figure 4).

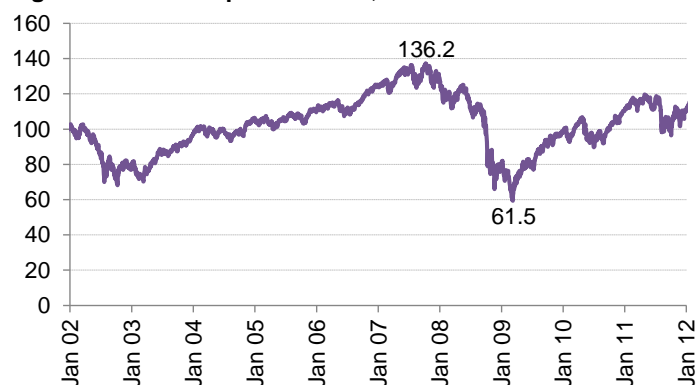
US retail investors hold nearly \$9trn in low-yielding investment instruments

Total holdings of public equities and in particular bonds are many trillions more in total investment capital. Not all forms of retail investment are analogous or substitutable for crowd-funded investments.

5.1. S&P 500

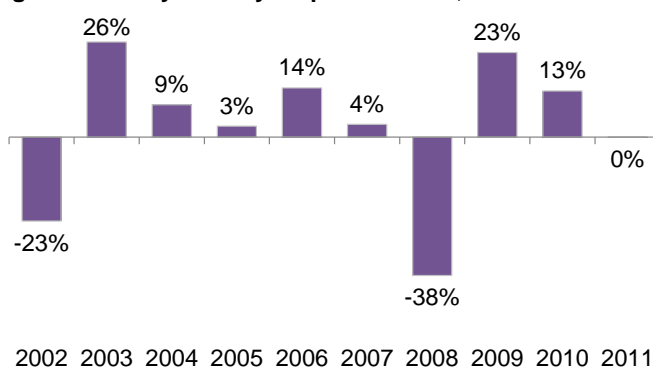
The Standard and Poor's 500 index is the benchmark for US equities. It contains many of the largest public companies and is used as a proxy for the performance of the entire equity market.

Figure 5: S&P 500 performance, 2002-2011



Source: Bloomberg. Note: rebased to 100 on 1 January 2002

Figure 6: S&P year-on-year performance, 2002-2011



Source: Bloomberg

The S&P 500's average annual performance of 2.99% for each year between 2002 and 2011 masks a great deal of year-to-year volatility

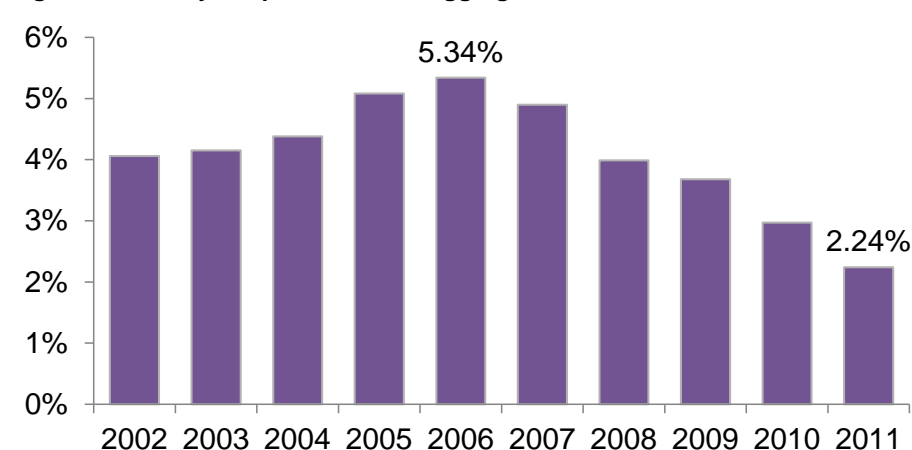
The overall average yearly return for US equities is 7.15% since the 1920s. Some decades (such as the 1990s) saw very strong average annual performance of more than 15%. The 1970s, however saw only a 5.8% average return with three strongly negative years. In the past ten years, the S&P500 traded essentially sideways, gaining only a few percent over the entire decade (Figure 5). The 2000s had both very high growth, and profound year-on-year losses (Figure 6).

5.2. Bonds

The US bond market is enormous. The total domestic debt bond market exceeds \$38trn in value. Bonds have actually outperformed equities on an average basis in the past decade (Figure 7).

The US domestic debt bond market exceeds \$38trn

Figure 7: Barclays Capital US Bond Aggregate Index, 2002-2011



Source: Bloomberg

Bonds returned 4% on average from 2002-2011 – higher, in fact, than the S&P500 over the same time period.

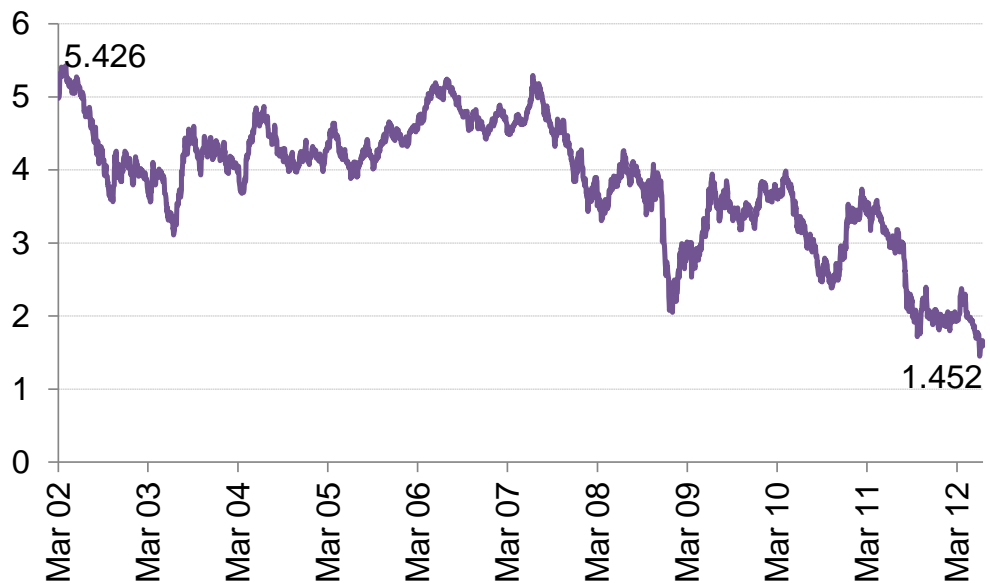
In the 2000s, the bond market not only outperformed equities, it was also much more stable. Though bonds declined in yield when equities collapsed in value, they did not go to zero.

5.3. Treasuries

United States Treasury Bills (“T-Bills” or “Treasuries”) are short-term debt obligations backed by the US government. Maturities are less than a year, typically, one month, three months, or six months. Treasuries are considered to have very little to no default risk, and due to their short maturities, little interest rate risk either. Treasuries are tracked via indexes, such as the 10-year constant maturity yield (Figure 8).

Treasuries remain near 10-year lows, thanks to loose monetary policy and high demand for riskless assets

Figure 8: 10-year US treasury yield, 2002-2011



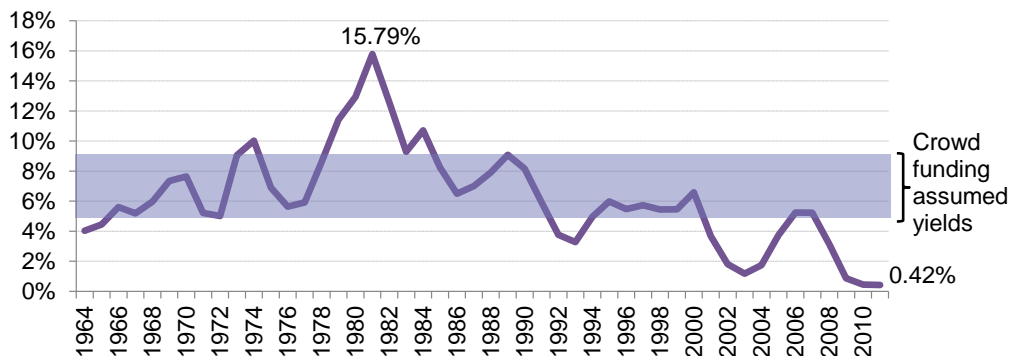
Source: Bloomberg, US Treasury

Treasuries directly reflect government monetary policy, so when the Federal Reserve is raising or lowering the Federal Funds Rate (its key interest rate), Treasury rates will rise and fall accordingly. Today, with loose monetary policy and a demand for riskless assets, Treasuries remain near decadal lows.

5.4. Certificates of deposit

The current yield on 6-month CDs is an all-time low of 0.42%

Figure 9: Rate of return on 6-month certificates of deposit (CD), 1964-2011



Source: Bloomberg

Certificates of deposit (CDs) are short-to-medium term investments similar to bonds: in exchange for a fixed capital investment, they pay interest at regular intervals, with the principal and interest

both redeemed at maturity. Many CDs have early withdrawal payments, or interest forfeitures, if investors try to exit before the CD term is reached.

CDs vary greatly in yield. Throughout the 1960s and through the 1980s, short-term CDs yielded above 5%, including nearly 16% during the very inflationary period in 1981. However, yields since 2000 have been lower, with even peak yields below the averages in previous decades. The current yield on 6-year CDs is an all-time low of 0.42% (Figure 9).

\$528bn REIT market cap

4.11% Median yield

4.63% Average yield

17.71% Maximum yield

5.5. REITs

Real Estate Investment Trusts are direct property investment vehicles which trade like a stock on major financial exchanges. Many REITs have dividend reinvestment plans, meaning that gains are ploughed back into the investment. REITs are considered a highly liquid way to invest in real estate, both in equity and in property mortgages. While REITs can be high yield, they are by design directly exposed to property market swings, and with 2008's housing bubble burst, REITs performed in line with equity indexes.

US REITs top \$500bn in total value as of April 2012. While the maximum yield on US REITs is more than 17%, current median and average yields are below 5%.

5.6. Potential market size

Given the size of the US retail funds market, devoting even a very small fraction of investor capital to clean energy crowdfunding would create meaningful amounts of capital for the sector.

1% of current retail investment in savings accounts, money markets, and US Treasuries would provide more than \$90bn in clean energy crowdfunding. 0.5% of the bond market would yield another \$190bn. Crowdfunding commitments to clean energy would become meaningful for clean energy in an absolute sense, even if they still remain a tiny relative proportion of all retail funds available for investment.

A relatively tiny proportion of US retail funds could provide meaningful investment capital for clean energy

6. CONCLUSION

6.1. The end of the beginning

Crowdfunding for clean energy certainly exists, even if it is still nascent. Venture capital investors are devoting early-stage millions to fund today's most visible companies, and Silicon Valley demo days, eager entrepreneurs are already pitching copycat companies describing themselves as "the Solar Mosaic of X" or "Like Kickstarter, but for Y".

The principles of investing are clear though the details of ensuring investor protection and creating a viable secondary market and insurance products must be decided. For the companies themselves, exit strategies if any are not yet clear, though purchase by a socially responsible investment fund – or an existing third-party financier – is likely. Brownfield power plants in or near cities are the next logical investment, bigger than rooftop systems and with the added benefit of creditworthy power purchasers if selling to a utility. Energy efficiency retrofits are the next logical step, perhaps with an eye towards projects such as public housing, schools, or municipal buildings. As Winston Churchill would say, it is perhaps the end of the beginning.

6.2. The crowd can crowd in

Crowdfunding for clean energy has peril and promise. As an early-stage angel or venture financing vector, it is fraught with problems and offers little if any investor protections. As a vehicle for project investment, it is more promising. Even a fraction of a percent of the trillions of dollars in existing low-return retail financial instruments could make a significant impact on clean energy financing. Crowdfunding may be a way to engage and energise retail investors, and gather – or 'crowd in' – billions of dollars for clean energy.

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