PropTech Global Trends 2023

Annual Barometer

Gouvernement Princier
PRINCIPAUTÉ DE MONACO

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Content

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Introduction

Real estate is an essential cornerstone of the Monegasque economy, accounting for 20% of GDP and employing over 15% of the workforce.

The real estate industry has experienced significant changes in recent years due to the transformative power of digital, particularly AI which could generate $110 billion to $180 billion or more in value for the sector according to the McKinsey Global Institute. These technologies have been a catalyst for the growth of the PropTech sector, which last year raised $32.80 billion across 80 countries.

As we navigate through these changes, it is crucial that Monaco adapts while preserving its unique values and heritage. In this context, we intend to build on our strengths to become a central hub in the expanding European PropTech industry.

To enable this ambition, the "Extended Monaco" program has successfully spearheaded the digital transformation of the country, in line with the vision of His Serene Highness Prince Albert II:

- Monaco now has advanced digital infrastructures that meets the highest standards of the world's leading city-states, including 5G, fiber optics, a digital twin of the Principality, a Sovereign cloud, and a data platform to enable AI applications.
- Simplification of administrative procedures for residents, especially those related to housing: 85% of administrative requests are now processed online, thanks to the implementation of web platforms and a digital identity. Our objective is to further increase this rate through AI and broadening training initiatives.
- Transforming the Principality into an intellectual hub in partnership with the ESCP Business School. For the fourth consecutive year, Monaco is proud to be involved in an annual PropTech barometer, as well as organizing specialized conferences to highlight the sector's innovations and potential.

Massive investments in recent years have enabled the Principality to build some of the world's most advanced digital infrastructures. As the AI Age begins, the extensive efforts undertaken promise to secure a competitive advantage for the Principality, making it an influential Proptech center and improving its economy and attractiveness.

Frédéric Genta
Member of Monaco Government in charge
of attractiveness and digital transition

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Executive Summary

The 2023 PropTech Annual Barometer presents a detail-driven update on the international PropTech industry. Capitalizing on even more complete data, we give an overview of the recent historical developments of the PropTech industry, as well as an update on events that occurred during the 2022 calendar year and 2022-2023 fiscal year.

To elaborate our analysis, we rely on our four key categories, building, managing, living, and investing. However, we also add the industry verticals of Business to Business, Business to Consumers, Information Technology, and Financial Services to our analysis. We have found that the PropTech market did indeed consolidate in 2022 through 2023, as we were predicting toward the end of the past fiscal year. At the same time, the diversity of technologies offered as solutions to complex problems has continued to proliferate. In this year's Barometer, we seek to call additional attention to new and innovative technologies at every turn. We additionally have expanded our regional analyses of Europe, including France, Spain, and Germany, as well as Asia in our breakdown of the PropTech industry by regions. We have kept our focus on competing industries from last year while refining our methods for such discussions and have included a special focus on predicted M&A deals and predicted IPOs in our Future Projections chapter. Finally, we completed four special case studies to illuminate important stories in the PropTech industry. These case studies were informed by direct conversations with industry leaders and included important insights about quickly changing trends in PropTech.

Our first case study this year focuses on the potential impact of bank failures on the PropTech industry, concluding that these impacts were not as dramatic as they were feared to be. Our second examines trends in Mortgage Tech, especially highlighting a major consolidation of the market. Our third emphasizes the often underreported-on sector of Construction Technology, concluding the future is driving towards intersections with Climate Tech. Thus, our fourth case study dives more deeply into the intersections of PropTech and ClimateTech while emphasizing the necessity of PropTech's innovations for the future.

Readers of this year's Barometer will appreciate our combination of consistency and rigor. This year's Barometer features updates on familiar aspects of the industry, such as "PropTech in the United States," while expanding our coverage into new conceptual and geographical terrains. While these landscapes have proven uncertain at times in the past year, the future of PropTech does indeed remain bright.

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Chapter 1:
PropTech, An Introduction

Why is a focus on PropTech vital?

Previously viewed as a latecomer to the tech revolution, **PropTech is now vitally integrated into the world's most significant real estate markets.** PropTech companies are also prominent startups in the most populous cities of developing markets. Further, in the high-value markets of Monaco, New York, Hong Kong, Singapore, Paris, and London, PropTech companies can be found easing friction in each type of transaction. Short-term and medium-term furnished housing stays are now facilitated by the advances of PropTech. Yet the landscape of the contemporary business world is not characterized by inevitable growth and stability. This is to say nothing of how market investors like Silicon Valley Bank can cause significant disruptions in the broader marketplace. Although there has been a well-predicted market consolidation over the course of the past year, the world of PropTech companies remains staggeringly diverse, including companies involved in addressing the most pressing challenges of the world today. Without a doubt, **PropTech will continue to have a significant impact on the world we live in for decades to come.**

Where is PropTech most relevant?

PropTech emerged from a combination of innovations in the major American Real Estate markets of New York, Washington D.C. and California in the 1990s. Although Real Estate lagged in the initial dot com tech boom of the 1990s and potential initial growth was stymied by the global recession of the early 21st century, PropTech finally took off in the second decade of the 21st century, **quickly spreading throughout Europe, Latin America, Africa, and Asia, including significant markets in the Middle East.**

In this year's barometer, we will continue our emphasis on significant regions for PropTech. However, we will also feature special focuses on key European markets, including France, the United Kingdom, Spain, and Germany. In our subsection on Asia, readers will find that PropTech is impacting the East Asian hubs of Japan, China, South Korea, and Hong Kong, along with new Southeast Asian players, such as Indonesia, Malaysia, and Singapore. India, along with China, has been a significant player across the tech sector, and the same is true for PropTech in India as well. In Africa, South Africa and Nigeria are the most significant new hubs for PropTech, while Colombia, Brazil, and Chile have been attracting attention to Latin American markets. In the end, as technology has become increasingly integrated into each element of our daily lives, it seems safe to say that PropTech is increasingly everywhere, all at once.

What is PropTech?

PropTech is a portmanteau of the terms "property" and "technology." An alternative name for PropTech might be **"Real Estate Technology."** However, through a combination of technology, real estate, and platform economics, it is important to clarify that such industries as "Construction Technology," (ConTech) which might not automatically be presumed to be part of our consideration of Real Estate Technology are indeed part of the map of the PropTech universe.

Of course, PropTech technologies could be relatively simple user-facing software applications (apps) that facilitate searches for vacation rentals. However, complex data-analysis algorithms or business-to-business applications that facilitate the ease of real estate transactions are considered PropTech. Additionally, various forms of financial technology (FinTech), which might be used to facilitate the processes of applying for, evaluating, and providing mortgages - often referred to under a subcategory of companies called "Mortgage Tech" - are also part of the PropTech universe. Similarly, any FinTech software company that facilitates investment in residential or commercial property would also be considered PropTech. In last year's barometer we summarized the field of PropTech through examining four key categories of companies (Building, Investing, Living, and Managing).

Like last year, we have selected the aforementioned four categories to classify PropTech companies. These categories help us develop an elaborate analysis of the PropTech industry. Additionally, in our efforts to provide a better understanding of market dynamics, we have introduced a second form of classification this year, based upon a given company's primary shared niche within the entire marketplace, as described by "industry vertical." Thus, we also consider PropTech companies in terms of four non-overlapping, industry verticals: **Business to Business (B2B), Business to Consumer (B2C), Financial Services, and Information Technology (IT).**

Our second method allows us to get the broadest possible and most accurate currently available data on the PropTech industry. Our dataset also occasionally includes companies whose primary industries might be Healthcare, Energy, or Materials and Resources, but because of the nature of the deals they have been involved in, are entering into the PropTech marketplace. Furthermore, because market investments are increasingly cross-industry, we took into consideration the measurement of a specific element of a company, such as a subordinate company or business, which might operate in any of the fields of Real Estate Technology and Construction Technology, to add these to the existing dataset. Attention to such market dynamics is further illuminated through our case studies this year.

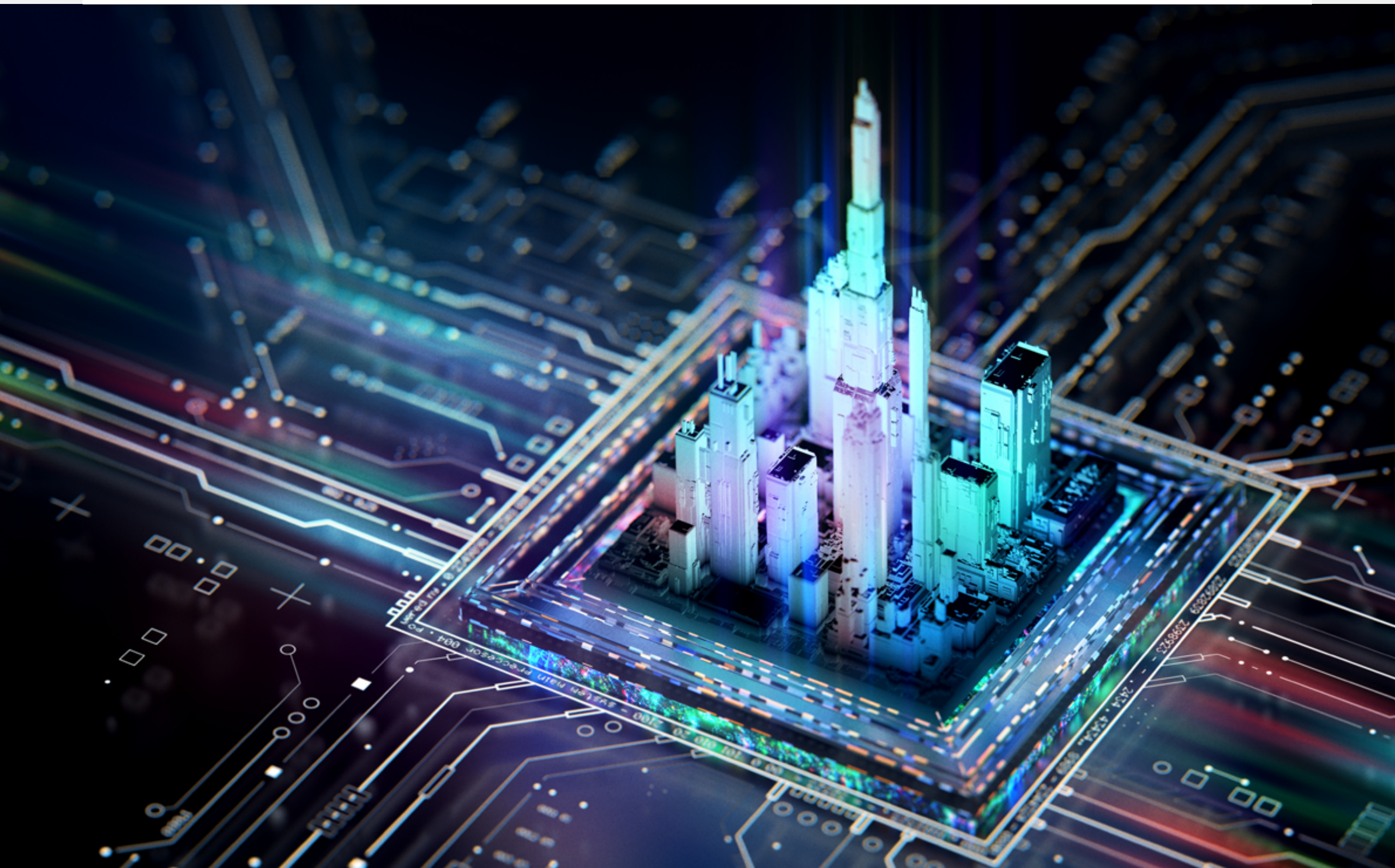
Who does PropTech impact?

Everyone should be familiar with the latest trends in the PropTech industry. You could be a government employee, who is searching for a short-term stay; you could be a young professional, traveling to a new city on a business trip; you could be a university student, seeking out an apartment or flat to rent by yourself or with mates; you could be looking for a place to settle with your family or for your parents when they retire; you could be an experienced investor looking for a market opportunity or a young business school student attempting to learn about emerging industries.

PropTech is so interwoven with our daily lives that we do not often think about it. Even for laborers in very different industries, the nature of PropTech will impact their lives, simply because the real estate market is so interwoven with the economy of every country on the face of the earth.

If we look at the countries where the cost of real-estate to income is the highest on the face of the earth, we might find some markets we expect, like Hong Kong, South Korea, Argentina, and China, as well as some we do not, such as Ghana, Iran, and Cambodia.

From Shanghai to Silicon Valley, from Miami to Monaco, the innovation of PropTech impacts us all. Therefore, **we have composed the 2023 PropTech Barometer to speak to the widest audience possible, from industry leaders, students, and government officials to the general public.**



Chapter 2: Recent Developments in the PropTech Industry

4
CATEGORIES

2,177
COMPANIES

3,437
INVESTORS

$42.135
BILLION RAISED (2022-2023)

80
COUNTRIES

Overview

The focus of Chapter 2 follows recent developments in the PropTech industry during the June 1, 2022, to May 31, 2023, fiscal year[1].

We cover an overview of the year, breakdown the four categories of PropTech and subcategories considered in this report, and then give a detailed fundraising update for 2023. Next, we discuss top investors and investment trends, before covering mergers and acquisitions and concluding with an assessment of the top performers for the 2022-2023 fiscal year.

[1] As with all data in the 2022-2023 Annual PropTech Barometer, we rely on Pitchbook as a data source. Although we relied on Pitchbook to help us filter the data, all graphs and images generated are our own.

2,177

companies

At the end of the fiscal year 2022-2023, **2,177 PropTech companies** were in operation in the PropTech industry around the world. Over the past half-decade, the sheer proliferation of PropTech companies has compelled us to consistently reexamine our understanding of this vital industry. Our data this year suggests projected contractions in PropTech companies resulting from market consolidation, as well as a dramatic decline in investors. At the same time, the amount of money raised during this fiscal year alone is quite a bit more than last fiscal year. Still, a year-on-year comparison within our dataset based on calendar years tempers these results, suggesting the amount PropTech companies raised declined slightly when compared to the previous calendar year. Furthermore, with PropTech markets emerging in more than ten new countries makes the list of PropTech markets more diverse than in previous years, the data on the leading markets remains consistent, providing for a few shake-ups in the rankings.

First, we should consider the possibility that our data is improving in quality from year to year. We are likely able to capture more and more small companies that just exist for a single cycle or slightly more before being acquired than we were in the past. However, we are also likely to have better data on these small companies being quickly acquired than in the past. Relatedly, our data on companies outside of the United States and Western Europe is also probably improving, meaning we probably have an even better understanding of the global dynamics of this industry this year. We expect these trends of improved datasets to continue as time goes on.

Second, we should consider the possibility of industry growth to help explain the growth in capital raised in the second half of the 2022 calendar year and the first part of the 2022-2023 fiscal year. As we will demonstrate in this year's barometer, we do have very real evidence of substantial growth in the PropTech industry. This growth comes despite the economic challenges of rampant inflation, military conflicts involving global superpowers, and uncertain business conditions in the context of recovery from the global pandemic and the pressing challenges of climate change.

Third, we should consider the possibility that some of the major jump in funds raised by PropTech companies is essentially "sponsored" by large transnational investor firms and influential VCs coming around to see the reality that PropTech is a critical industry for the future of business. We will also detail the degree to which we find evidence for this explanation when we examine the "investors" category in more detail.

Four Categories of PropTech Companies

As we have revised our methodology for examining PropTech companies in this new climate, we divide the companies into four critical categories, based on their primary relation to the property life-cycle. These categories are **Building, Managing, Investing, and Living,** as explained by the **table below.** We have discussed the nature of these categories in depth in our previous PropTech Barometers (including the 2020, 2021, and 2022 editions).

BUILDING

- Drones
- Indoor Mapping
- 3D Printing
- Digital Twins
- Construction Management

MANAGING

- Online search and sales platforms
- Mortgage Technologies
- Real Estate Agent Tools
- Commercial Real Estate
- Property Management

INVESTING

- Big Data and Analytics leveraged to stabilize portfolios
- Risk Assessment Models

LIVING

- Home services
- IoT Home
- Life/Home, P&C Insurance
- Facility Management
- Smart windows
- Solar panels

Examples of Technology

This year, thanks to an enriched dataset, we are also providing information on a new form discussing company categories, called an **"Industry vertical," which discusses how companies cater their specialized services and products to a particular target audience within a specific niche in the market.** The verticals that we consider are **"Financial Services," "B2B," "B2C," and "Information Technology."** Importantly, although it is possible that a company in the "Managing" category may also engage in "Investing" — as exemplified, for instance, by the number of managing companies exploring various forms of iBuy investing – we sort these companies into categories on an exclusive basis based on their primary relation to the life cycle of a given property. Similarly, while it is certainly possible that a B2B (Business to Business) company may engage in software development and providing IT services, our dataset sorts these companies exclusively, based on their primary Industry vertical.

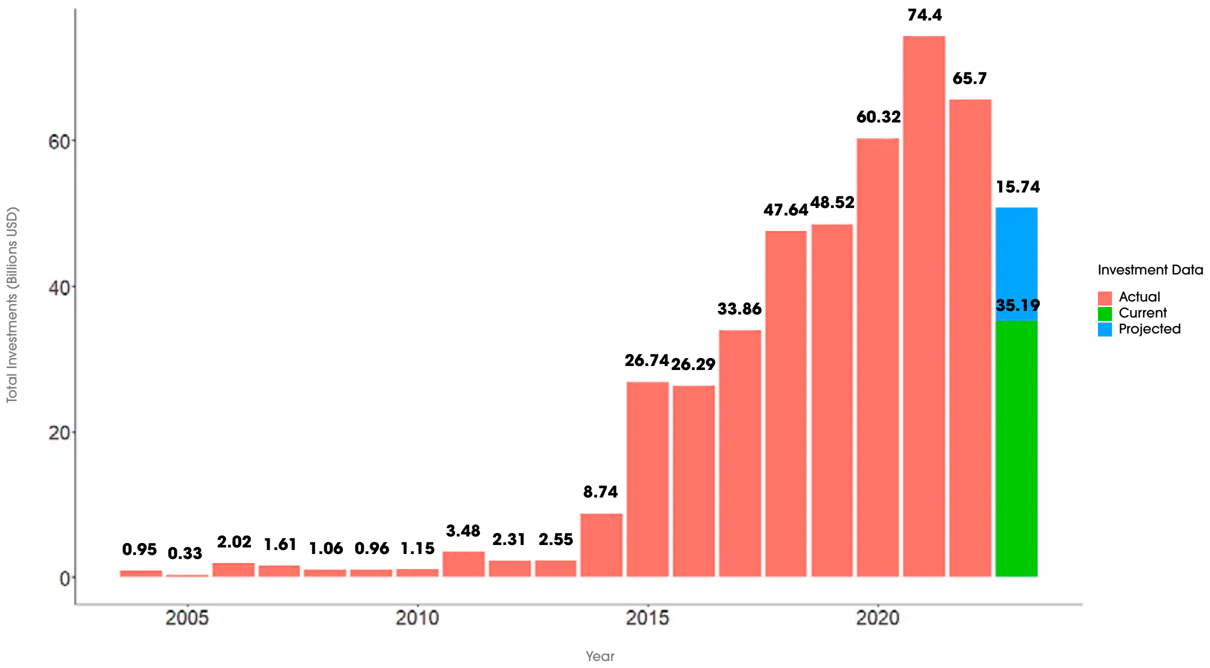
	FINANCIAL SERVICES	B2B	B2C	INFORMATION TECHNOLOGY
Definition	Services targeting investment, lending, and the management of money	Products and Services that are conducted between companies	Products and Services that are primarily for consumers	Companies that primarily develop software, hardware, or computer peripherals
Examples	• iBuy investing • co-financing • mortgages • insurance of assets • REITs	• business services • legal services • tax services • digital brand services • equipment services • materials services	• typically include a public facing searchable online platform • tend to cater to niche markets of consumers (low income, luxury, college students, young professionals etc.) • primary use of technology is to facilitate transactions	• construction simulation software
Primary Technologies Developed	• digitalization, algorithms to process big data, and block chain for security	• primarily development of technology is typically incredibly, diverse, ranging robotics to drones, from 3D printing to blockchain, from big data safety and efficiency analytics to custom software applications	• primary development of technology primarily includes algorithms and big data analytics on web-hosted platforms, coupled with some form of visual technology to catch the eye of the consumer	• software • applications • web-based applications/ platforms • APIs • algorithms • platforms

Readers familiar with last year's barometer may remember our **"Investing, Building, Managing, and Living" categories**, which captured significant features of the market based on the way that these companies shaped interactions with "property" itself. Investing companies invested in property, building companies built it, managing companies managed it, and living companies facilitated living in it. However, as previously suggested, it is increasing difficult to categorize some companies, especially those engaging primarily in software development for products used across the life-cycle of a property, or financial services, including new models of co-financing whereby these companies are engaging simultaneously in both the Managing and Investing aspects of our previous categories.

Needless to say: each path and method of analysis has its advantages. We hope our current method of utilizing company categories, while providing enriched analysis by industry vertical helps readers more clearly categorize how PropTech companies are providing services to the market as a whole, a slightly different emphasis than last year. To keep it simple, Financial Services companies provide support for any possible form of financing. B2B and B2C companies are companies shaped by the way they interact with clients, as businesses and consumers, respectively. Finally, Information Technology companies are those that are primarily involved in the creation, processing, storage, and analysis of data.

2023 Fundraising Update

Figure 1: Total Capital Invested in PropTech, Calendar Year 2004-2023, Including 2023 Projections



60.30

Billion USD

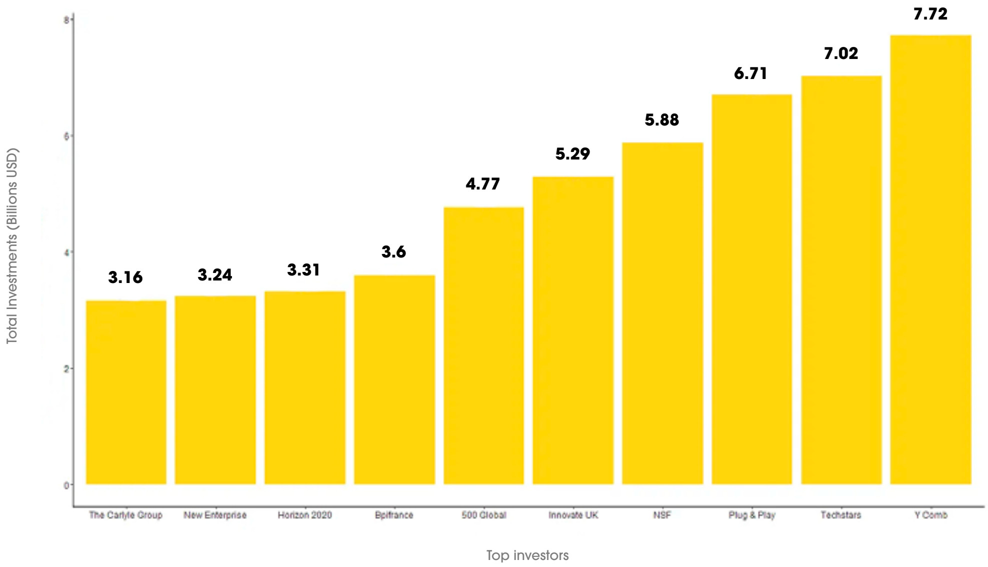
Although PropTech is an entirely unique industry, we begin by highlighting some ways that PropTech tends to follow market trends, to better understand how the PropTech industry also diverges from these trends. To begin with, we can see that the overall trend of total capital invested in all forms of Property Technology, Mortgage Technology and Construction Technology is relatively small in the early years of the tech boom, with initial slight declines in 2008, and a bumpy initial road to recovery, with growth years in 2009, 2011, and 2014, while 2010, 2012, and 2013 experienced slight declines in investments. However, by 2015, the PropTech industry took off. Although the actual deal count was seemingly impacted by the COVID 19 pandemic, as growth slowed from 2,344 in 2019 (+296) to 2,484 in 2020 (+140), the capital invested still grew, from **$48.50 Billion USD to $60.30 Billion USD**. With 715 deals involving 689 companies and 11.06 Billion Pounds totaling investments from the first five months of 2023, a simple adjustment for the rest of the year suggests there will be fewer investments and deals by the end of the calendar year, when compared to the past years where large capital injections bolstered markets.

Massive cross-sector cash flows continued to increase in 2020 through 2021, in part because the reduction of interest rates to practically zero made cash cheap and in part because injections of capital into the market from central banks increased the flow of cash available to investors. By 2022, as central banks began to increase interest rates, inflation reached staggering levels, and global geopolitical conditions worsened, we saw declines in investments in PropTech much like in every other sector. However, these declines did not hit PropTech the hardest out of all technology industries. Even still, if the patterns from the first several months of 2023 continue to hold, we can expect a continued element of post-pandemic economic recovery, providing a silver lining within a cloud of continued market uncertainty. Although this long-view matches the big picture across industries, we will also see how PropTech is positioned to perform better and assume less risk than some notable competing industries throughout this year's Barometer.

The big stories in early 2023 impacting investments across tech sectors were the failures of a series of mid-range banks, including SVB, Credit Suisse, and First Republic, all of which were invested in varying forms of technology sectors. The failure of SVB, naturally, hit the FinTech sector hard, while the failure of Credit Suisse hit biotech. We explore these difficulties through a difference in differences comparison in Case Study 1. Case Studies 2 and 3 then focus on two key overlapping subsectors with PropTech, Mortgage Tech and Construction Tech, shedding light on the performance of companies that deal more directly with financial transactions and companies that deal more directly with physical materials, so that readers might contrast the two foci with a third in our fourth case study. Our fourth case study this year, then, deals with the way that PropTech is working to address the most pressing issue of the 21st century, through its intersections with Climate Tech. After these case studies, we move to the meat and potatoes of this year's PropTech Barometer, addressing the Global PropTech industry (Chapter 3) and explorations of the PropTech industry by region (Chapter 4) before turning to our comparison of competing industries (Chapter 5) and future projections (Chapter 6).

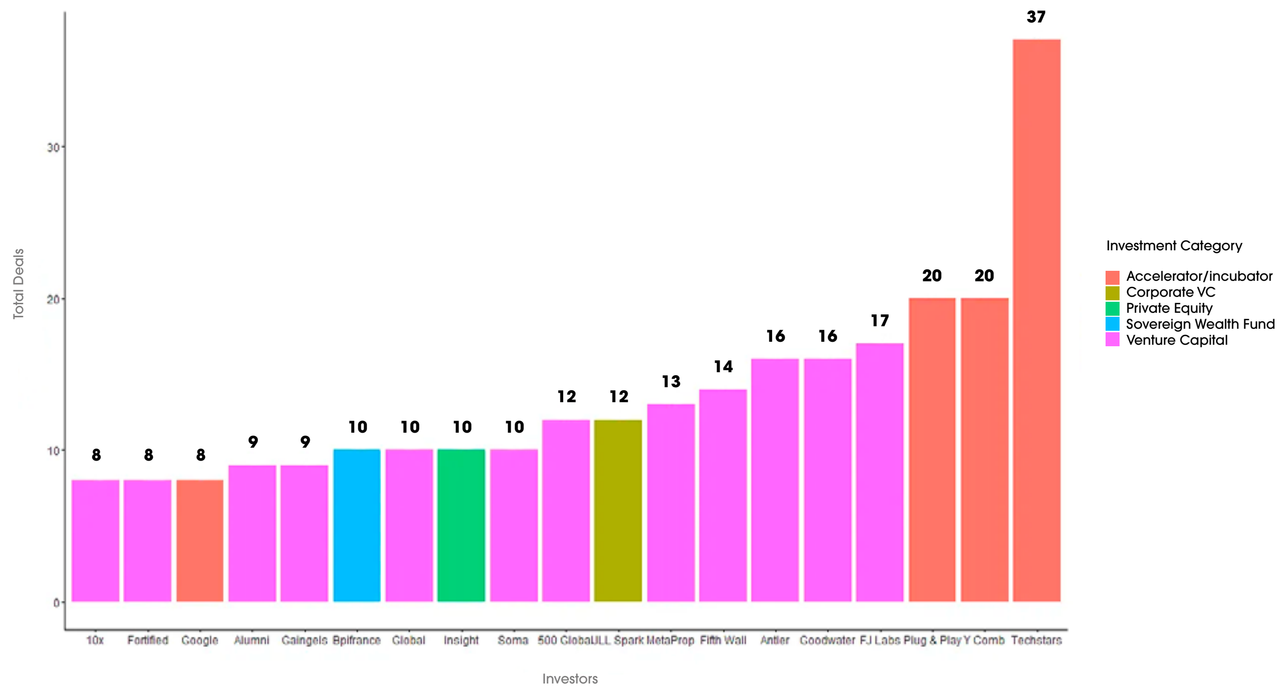
Top Investors & Top Investments

Figure 2a: Top Investors by Total Investments as of 2022-2023



If we rank the top investors who participated in deals in the past year by the total number of their investments over the lifetime of their firm as of 2022-2023, we have an informative picture of the top players of the PropTech industry. Unsurprisingly, because of their long term position and access to capital, government funded ventures through **the National Science Foundation in the United States, Innovate UK, and Horizon 2020 SME Instrument in the European Union are on the list of the top ten investors** in terms of their total number of investments over time. However, most of these groups have not been very active in the past 12 months. Horizon 2020 SME instrument is mostly no longer active, having participated in just one deal in the past 12 months, while Innovate UK and the NSF participated in just five and three deals respectively. The other top ten players represent a mix of PE/Buyout (**Enterprise Ireland**), Sovereign Wealth Fund (**Bpifrance**), and Venture Capital (**New Enterprise Associates** and **500 Global**). Bpifrance and 500 Global ranked in the top twenty most active investors this past year but just missed out on the top ten. Nevertheless, the cream of the crop remains three accelerator/incubator firms, Y Combinator, Techstars, and Plug and Play Tech Center, all three of which are also on the top ten list for most active investors this past year, along with the top ten investors for the year in terms of total investments. In other words, the most active investors are those that specialize as either accelerators or incubators.

Figure 2b: Top Investors by Number of Investments for 2022-2023



techstars_

37

deals

Image 2b shows the top investors in PropTech in the past year by raw number of investments. Unsurprisingly, major players in the startup landscape like **Techstars (37), Plug and Play Technologies (20), Y Combinator (20)** and **FJ Labs (17)** are at the top of the list. As a measure of the activity of these top players, FJ Labs had more than twice the number of deals as Google, Fortified, and 10x this year, which took the number twenty, nineteen, and eighteen spots in this year's rankings. However, the data also shows a relatively diverse subset of midrange players, as measured by frequency of activity, who were very active in the last year, including Goodwater Capital, Antler, Fifth Wall, MetaPropNYC, JLL Spark, and 500 Global. Then, although they didn't quite break into the top ten, we have a diverse list of second tier players, including Soma Capital, Insight, Global Ventures and BpiFrance, each with ten deals. These were followed quite closely by Gaingels and Alumni, who had nine deals each, along with Google, Fortified, and 10x, who each had eight deals.

Watch the interview

“Going to market is probably the main challenge for PropTech start-ups. It’s very difficult to navigate the space populated by companies with 100,000 personnel. You need a translator. You need someone who can help with connecting the right people in the industry and also with connecting you to the right clients, the ones that are ready to deploy technology solutions.”

Tanguy Quero
Investment Principal, JLL Spark
JLL Spark is the investment arm of JLL, which is committed to transforming the real estate industry through technological innovation

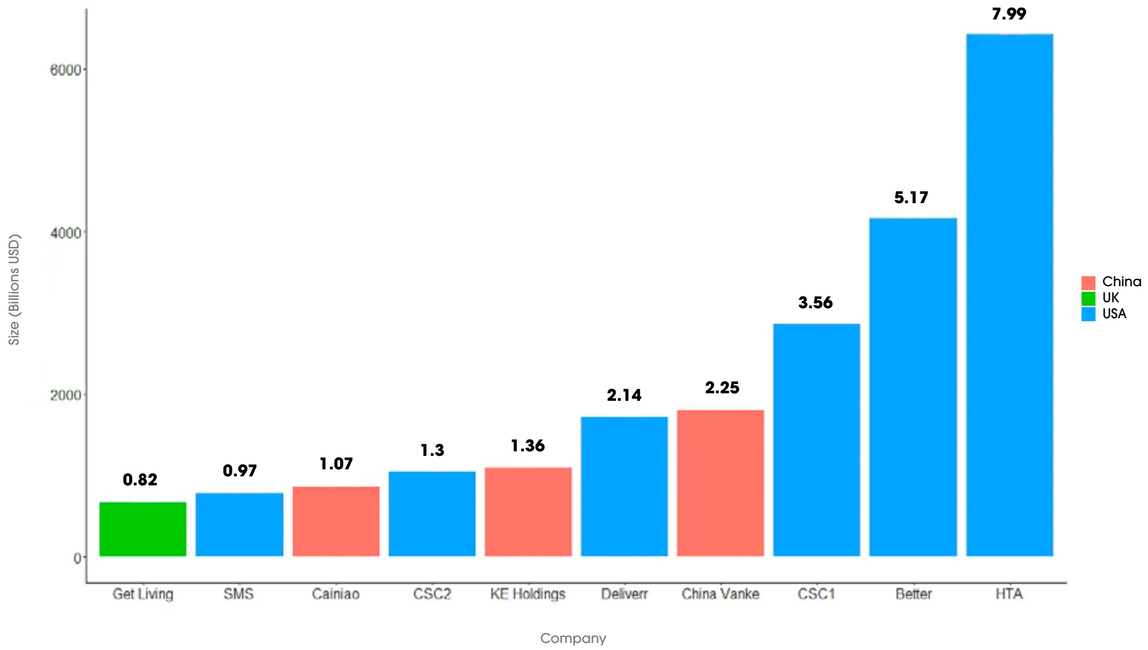
It is not surprising to find **JLL Spark, which specializes in early-stage PropTech startups**, MetaProp, which claims the world’s largest early-stage PropTech portfolio, along with Fifth Wall, which claims to manage the largest global fund specialized in Real Estate Technology, appear in solid positions on this list. However, Soma Capital is primarily a FinTech investment venture, and Techstars is a cross sector operation emphasizing technology investments. The repositioning of these very active investors flags an increased interest in PropTech from the broader sector of technology investors, suggesting some of these investors might be seeking both rapid growth opportunities and relatively more stable long-term investments, both of which are made possible with the advances of the PropTech industry.

JLL/Spark

metaprop.

FIFTH WALL

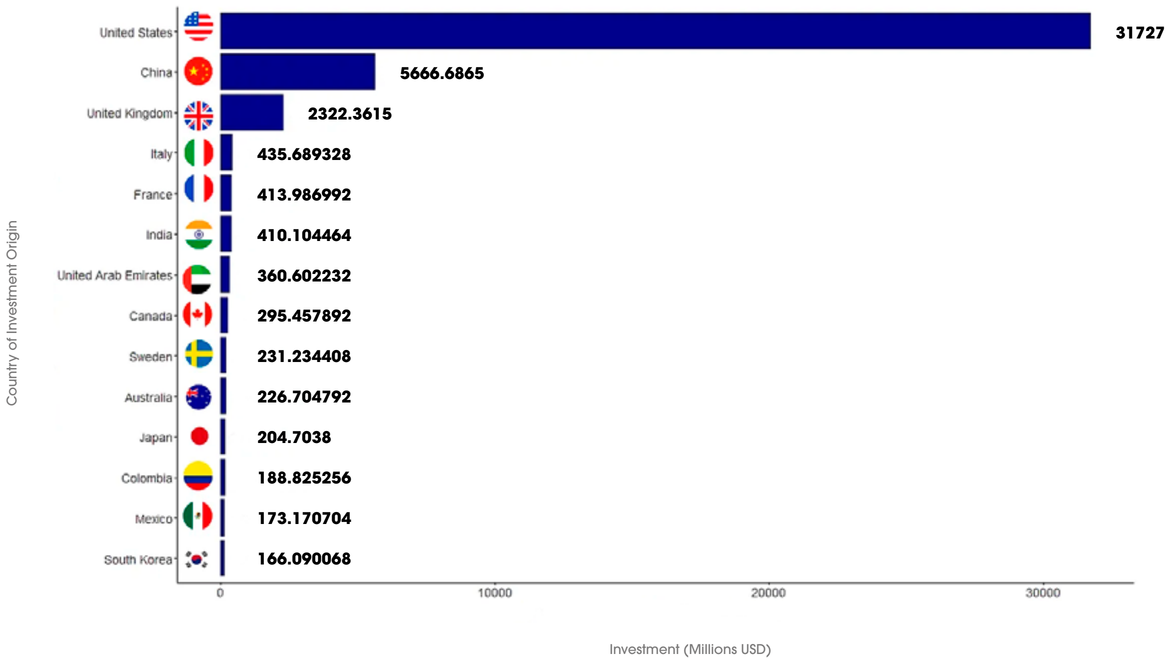
Figure 3: Top Investment Receiving Companies by Single Deal (2022-2023)



The top 10 investment receiving companies, as measured by deal size of their single largest deal, reveals critical characteristics of the PropTech market from the past year. Four of the top ten deals were major acquisitions. The most significant being the **Healthcare Trust of America** deal where **Healthcare Realty Trust** led the acquisition of the former, merging two of the largest providers of commercial healthcare real estate in the United States. While both companies operate as Real Estate Investment Trusts, leveraging Big Data and Analytics to make sound investment decisions, Healthcare Trust of America was also an owner and operator of medical office buildings, which made use of numerous technologies for their operational management. In the second most significant acquisition, **Better.com** acquired Aurora Acquisition – a blank check company established for the purpose of effecting a merger – through a reverse merger (as of March 9, 2023). The newly combined company is now named Better Home & Finance Holding Company and became traded on the public exchange as of August. Better.com has been a well-known innovator in the mortgage tech space and has been expected to go public for some time.

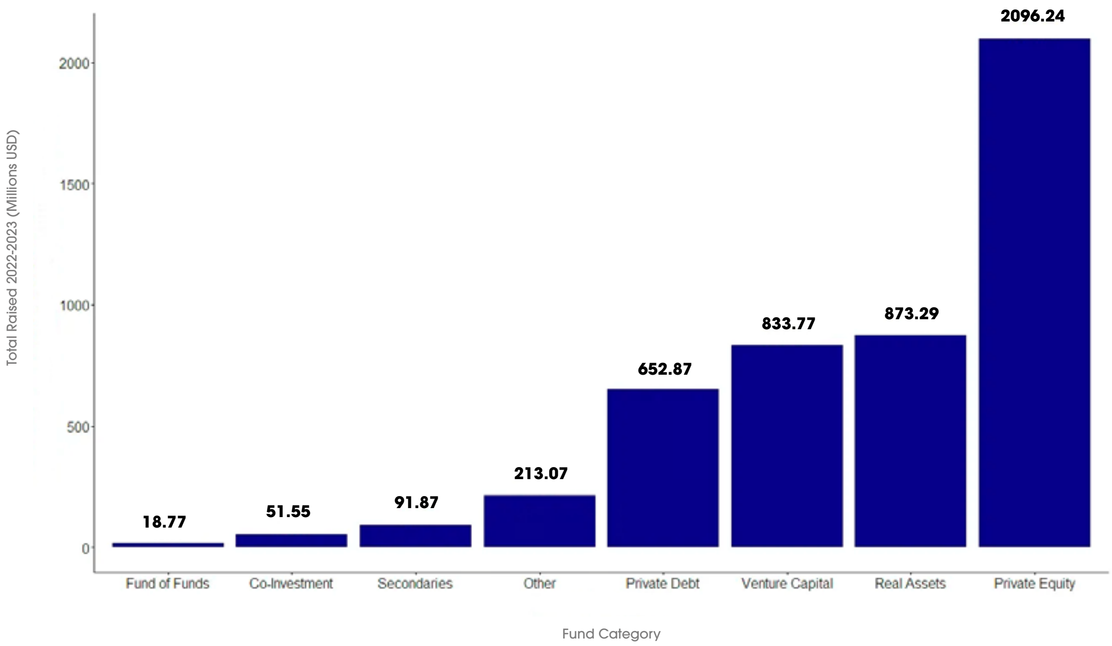
Additionally, **Shopify** acquired Deliverr, and **SMS Assist** was acquired by **Lessen.** Deliverr is an e-commerce fulfillment company, integrating with major players such as Walmart, eBay, Amazon, and BigCommerce, as a provider of seamless logistics support and two day shipping services. Thus, we may think of Deliverr as operating predominantly in the Living category of the PropTech Barometer. SMS Assist, by contrast, has focused specifically on a single element of the property lifecycle: facility maintenance. Indeed, **SMS Assist** has redefined the way property owners work with service providers. Every day, more than 200,000 individual properties rely on their technology platform to deliver an exceptional maintenance experience. Unfortunately, however, we were not able to confirm the details of the other deals, all of which took place between companies based in Hong Kong or the People's Republic of China, and it is striking that our data source was absent the details of these deals, along with the details of the two major Corporation Service Company deals. This is a reminder that some data remains hidden until deals are fully completed. However, most recently **Get Living** - an operator of a build-to-rent digital platform designed to service the private rental sector - sneaked into the top ten when the Qatari Diar Real Estate Investment Company sold their stake to Aware Super, the $99.81 Billion USD (A$150 billion) superannuation fund.

Figure 4: Top 500 Investment Deals by Country (2022-2023)



Although we will take a closer look at global trends in Chapter 3, a survey of the top 500 deals reveals some notable trends. Both the largest single deals and the greatest amount of capital amassed across **the top 500 sample deals were concentrated in the United States, followed by the People's Republic of China, and then the United Kingdom**. A second tier then emerges of Italy, France, and India, with the UAE and Canada forming a third tier, only to be followed by Sweden and Australia rounding out the top ten countries. Similarly, the second tier of single-largest deals includes those in Italy, the UAE, Sweden, India, and France. However, by the third tier of the largest individual deals, we begin to see a more diverse subset of markets, including Germany, Japan, Belgium, Spain, Israel, and so on. What is of note is that while the total capital amassed among the top 500 deals is still concentrated in a few predictable locations (the US, UK, and China), when we broaden our vision to begin to take into consideration significant individual deals, we are seeing key players emerge in really interesting, comparatively newer PropTech markets, such as Chile, Brazil, Indonesia, Kuwait, Colombia, Malaysia, and Thailand. Of course, we are also seeing a number of the top 500 deals in Pacific Rim markets (Australia, Japan, South Korea, Canada, and Mexico, among them) are important players, as are European markets like Spain, Austria, and Belgium.

Figure 5: Total Capital Raised by Fund Category (2022-2023)

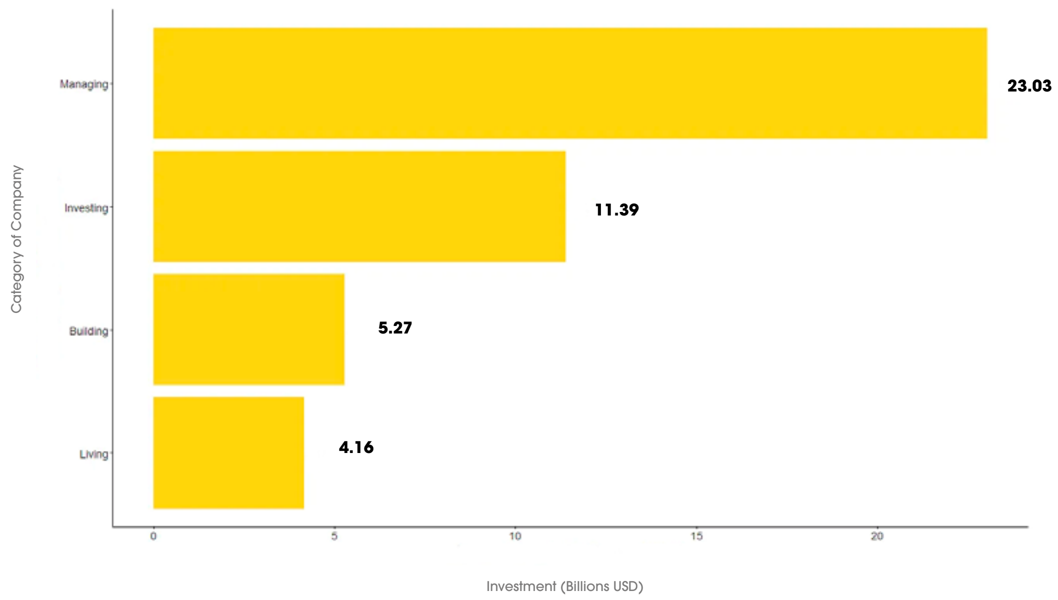


Across the 2022 to 2023 fiscal year, we do not see substantial changes in relative allocations of capital raised by most fund categories. For instance, while Private Equity made up a significant **43.01%** of the total capital raised in the past year, this is the most significant percentage point increase from the decade long trend of **39.73%**. The second most significant change is the relative growth of Real Assets investments (**.72%**) and the relative decline of Venture Capital (**-1.06%**), in terms of percentage of the total when compared to the decade long trend, which confirms the story that real asset investments have gradually stepped in to replace the resources of slightly declining venture capital activity in the wake of rising interest rates and other macro-economic indicators.

43.01%

Private Equity increase

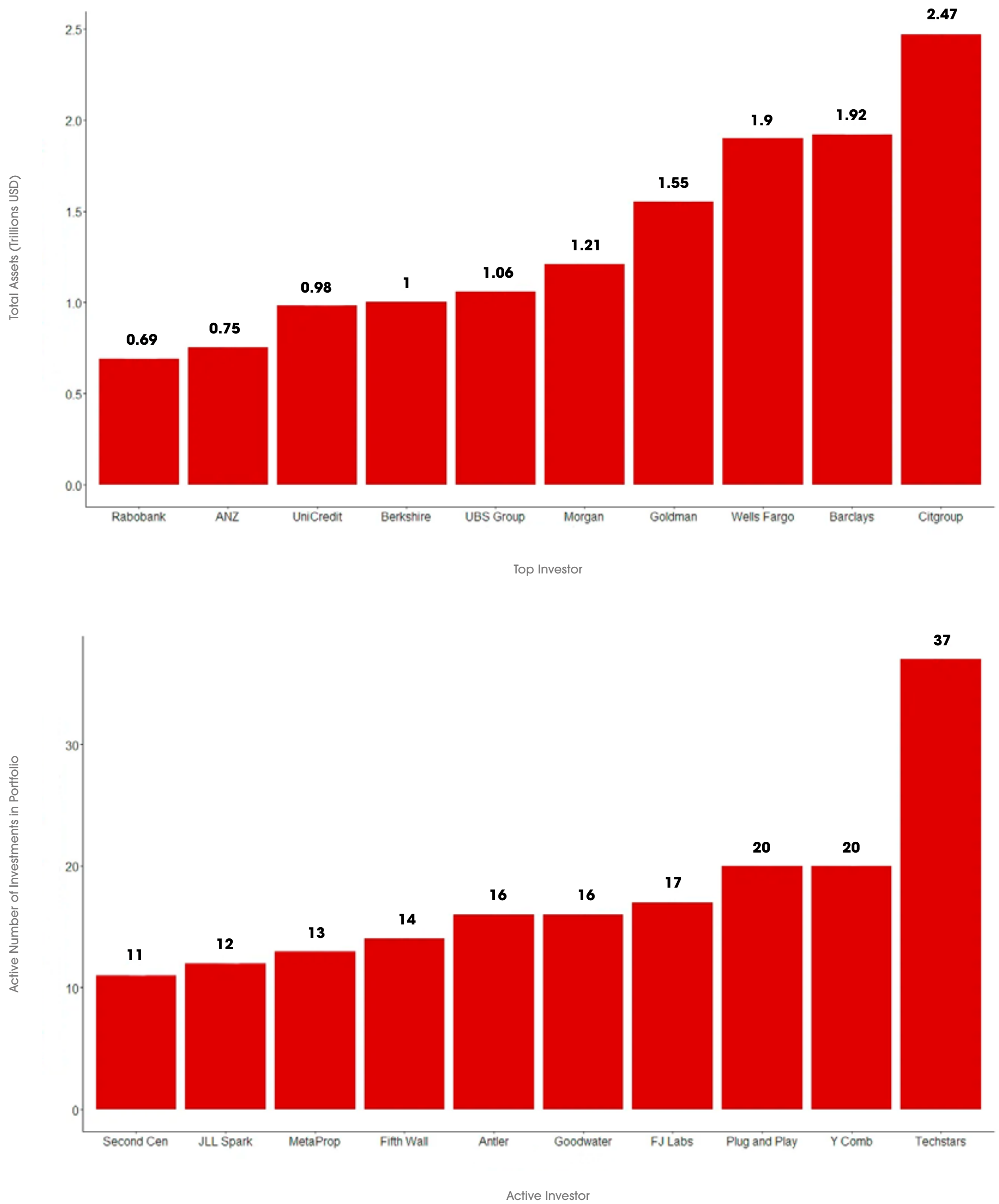
Figure 6: Investment Deals by PropTech Categories (2022-2023)



Across a sampling of the 500 most significant deals in the PropTech industry from the 2022-2023 fiscal year, several observed trends emerge. The largest deals in PropTech are concentrated in the Managing and Investing categories – as well as in the Industry Verticals concentrating on B2B services and Financial Services. **While the Managing category attracts $23.03 Billion USD, Investing attracts substantially less, at around $11.39 Billion USD**. However, B2B services and Financial Services are categories that each make up nearly $15 Billion USD. This suggests that there is a substantial sector of the Managing market that is engaged in Financial Services. We could regard these trends as evidence of the financialization of the PropTech market. As the Building and Living categories make up smaller portions of the contemporary market, the initial evidence suggests substantial room for growth remains in those categories in the near future.

While the numbers are not absolute, the general trend is for a greater number of these deals in the Information Technology category to be associated with Seed Round, Early-Stage VC, and Later Stage VC funding. Meanwhile, the larger deals in the other three categories tend to be a robust mix of debt financing, PIPE, and Mergers and Acquisitions. While mergers and acquisitions get the greatest press, especially Better.com's recently announced reverse merger, a deeper examination of the Information Technology subsector could reveal interesting trends. For instance, among the top ten deals in this category of companies, we find Later Stage VC deals making up six of the top deals, with the remainder being **Early-Stage VC (1), Merger and Acquisition (1), Equity Crowdfunding (1), and PE Growth/Expansion (1) rounding out the top ten**.

Figure 7: Top VC Investors (2022-2023)



Of course, there are several measures for top investors in a given fiscal year. We can consider total assets – or the sum of the book values of all assets owned by a company – where, of course, Citigroup, Barclays, Wells Fargo, Goldman Sachs, and Morgan Stanley come in soundly in the top five. We could also measure by revenue – being the amount of money generated by normal business operations – where we might get a more interesting mix, including Alphabet, The Home Depot, and Reliance Industries breaking into the top five. However, if we examine the "total active portfolio" – referring to the sum of the currently active investments that an individual company is involved with – we get an even more interesting snapshot, where **the top investors include Plug & Play Technologies, Y Combinator, Techstars, the National Science Foundation, and Innovate UK**, as previously indicated. However, when we narrow the list to the Top VC investors, we get an even more interesting picture.

The Top 10 most active companies involved in VC deals in the past 12 months include **Techstars, FJ Labs, Plug and Play Technologies, Y Combinator, Goodwater Capital, Antler, Fifth Wall, MetaPropNYC, JLL Spark**, and **Second Century** Venture. Naturally, most of these deals when considered by fund count – or the raw number of funds making investments in a category – and category are from companies focused on Venture Capital. However, a significant portion are **Private Equity (12.11%), Real Assets (8.27%),** and **Private Debt (4.47%)** deals. Notably, a quarter-by-quarter examination of these fund counts over the course of the past five years reveals a reliable trend: fund counts increase in the fourth quarter of the calendar year, or first two quarters of the fiscal year, when capital invested also tends to peak. However, this was not the case in 2022-2023. Instead, the highest the capital raised from venture peaked in summer 2022 and the fund count from venture peaked in the winter quarter, during a period when capital investment significantly declined. While capital investment recovered in the first two quarters of 2023, the fund count continued to decline. The question for the first quarters of the 2023-2024 fiscal year remains whether or not the year will follow long-term trends, with a winter-time growth in fund counts and capital invested, or if the relatively lower number of funds involved with the market currently is an indicator of future lower levels of capital activity by VCs.

PLUGANDPLAY

12.11%

Private Equity

8.27%

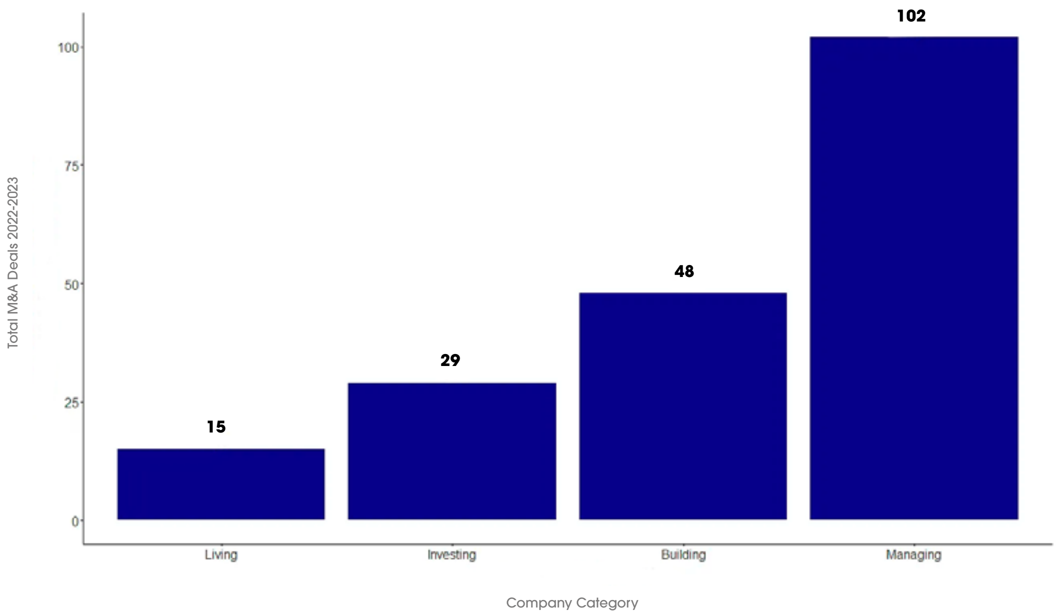
Real Assets

4.47%

Private Dept

Mergers & Acquisitions

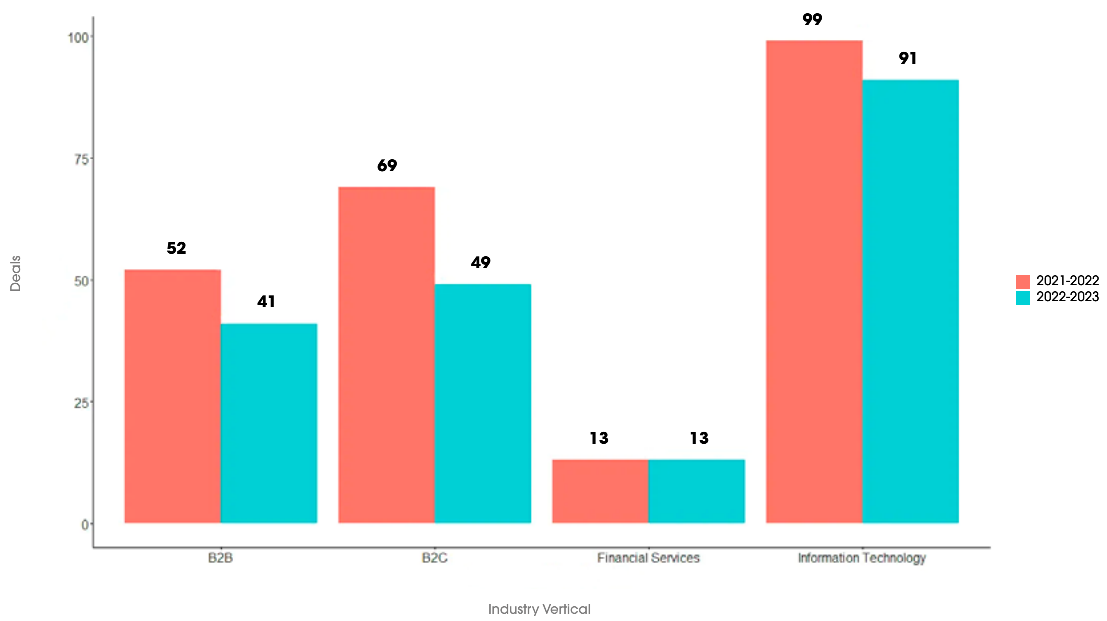
Figure 8: Mergers & Acquisitions by Company Category (2022-2023)



The above image shows the number of Mergers and Acquisitions across our four key PropTech categories for the 2022-2023 fiscal year. As we can see, much of the market consolidation occurred in the Managing segment of the market. In addition to the aforementioned Lessen acquisition of SMS Assist, three notable M&A deals were Inside Real Estates acquisition of **BoomTown!**, Inhabit's acquisition of **LMPM** and CoreLogic's acquisition of **Roostify**. **BoomTown!** Has been an industry leading cloud-based marketing and sales automation platform servicing more than 100,000 real estate professionals. Next, Inhabit, a software company servicing residential and vacation rentals, added **LMPM**, a property management system designed to support the vacation rental industry. LMPM supports bookings, inventory, work orders, and payment processing, among all other elements of managing vacation rentals.

Finally, **Roostify** has been a digital mortgage technology provider, and has thus been added to CoreLogic's leading property information, analytics, and data-enabled solutions portfolio. The deal will allow clients to gain critical information about borrowers and properties at the beginning of the loan origination process, saving time and money. However, because this was also the sector with the largest share of the market in terms of capital raised, the evidence suggests that there was a strong correlation between the capital involved in deals and the number of M&A deals in particular for the Managing category. However, we do not find this correlation to be as strong with the Investing and Building category, as there was less capital raised in the Building category, but, relatively speaking, a quite significant difference in the number of M&A deals. That said, when we examine the year-on-year difference across all of our categories, a trend of interest emerges.

Figure 9: Mergers & Acquisitions by Industry Vertical (2021-2022 Vs. 2022-2023)



The above image shows the number of M&A deals by Industry Vertical across the past two fiscal years. We can see that while the Financial Services segment of the market appears to not exhibit any notable trend in terms of evidencing market consolidation, the other three Industry Verticals do. B2B, B2C and Information Technology companies all had a very significant number of M&A deals. However, the number of M&A deals declined substantially from last year across all three of these categories.

Thus, the evidence suggests that **much of the trend of market consolidation we were predicting did continue**. At the same time, the pace of this market consolidation appears to have slowed ever so slightly.

Overall, **the deal count for Mergers and Acquisitions, almost half of the deals involved Information Technology companies this past year**, while both the B2C and B2B categories came in at between 20 and 25% of the share, with 49 and 41 individual M&A deals respectively. Financial services made up a much smaller proportion of these deals and only accounted for 6.67% of the total deals, with just 13 individual M&A deals this past year. A small portion of these deals also involved companies predominantly operating in the Materials and Resources sector (.51%, or a single individual M&A deal) or in the Healthcare sector (1.03%, or two individual M&A deals) but also involving PropTech companies. Top investors involved especially in Mergers and Acquisitions is a much narrower list from the 2022-2023 fiscal year when compared to previous cycles in the past half decade.

COMPANY	TOTAL REVENUE	TOTAL ASSETS
Reliance Industries	$86.284	$165.698
Oracle	$41.925	$107.520
Intuit	$11.878	$21.613
IQVIA	$12.128	$21.290
United Rentals	$11.348	$21.171

If we were to examine top investors involved in M&A by their total revenue generated for the year and total assets in the year, we arrive at a list of major players, including **Reliance Industries, Oracle, Intuit, IQVIA**, and **United Rentals**. However, each of these major players was only involved in a single deal this past year, meaning that while they were keeping pace with the market, they were not disrupting their position. The possible exception to this trend is the Hexagon Group, in the number 11 spot, which was involved in four deals.

COMPANY	NUMBER OF DEALS
Hexagon	4
Constellation Soft	2
Blueground	2
Habyt	2
InspectionGo	2
Texas First Rentals	2
Trimble	2
View Media Group	2
Volaris	2

As measured by activity, other than Hexagon, only Constellation Soft, Blueground, Habyt, InspectionGo, Texas First Rentals, Trimble, View Media Group, and Volaris were involved in multiple deals this past year. Finally, while most of the deals were concentrated in the North Atlantic (United States: 41.24%, United Kingdom 9.79%, Canada 5.67% and Germany 4.64%) we see the emergence of a number of European and Asian markets on the total list for the past twelve months, including countries like Portugal, the United Arab Emirates, India, Thailand, Malaysia, Spain, and Italy.

41.24%

9.79%

5.67%

4.64%

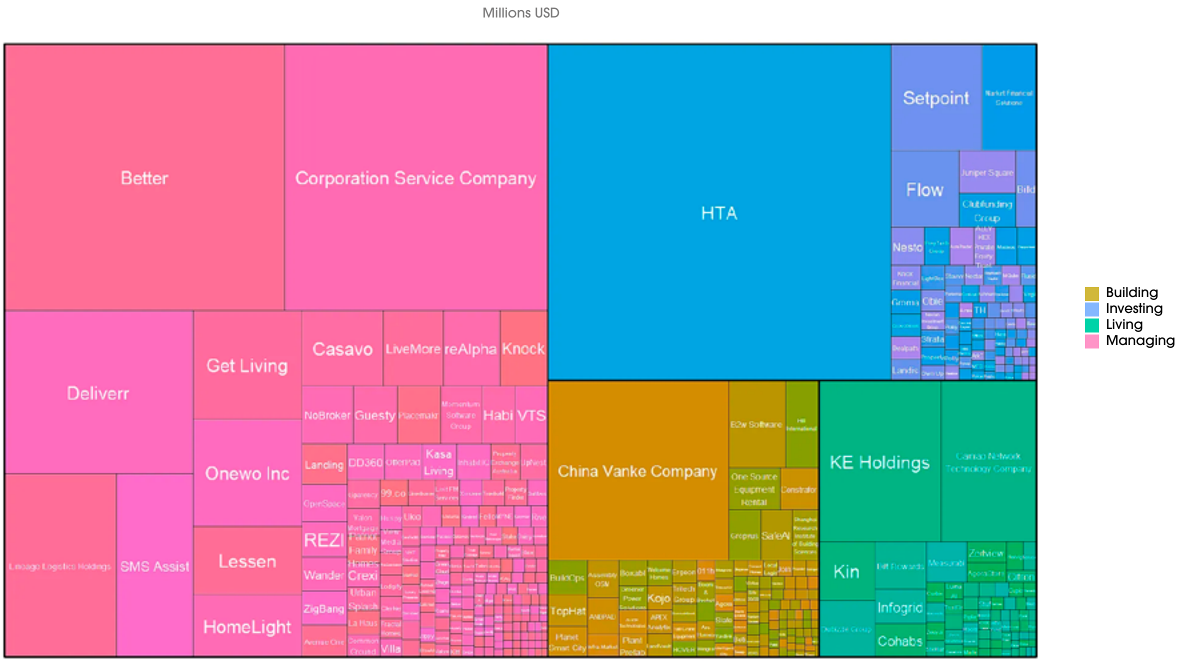
Watch the interview

"A disruptor is someone who builds something better, more efficiently, faster, and that's why clients choose to go with the disruptor. But also it's about the organization that you are building in the background, developing a new or fresh approach on how to build your team...our vision is 'How do we make people feel at home wherever they are?' that's our outward and inward vision."

Alex Chatzieleftheriou
CEO and Co-founder, Blueground
a provider of fully furnished short-term and long-term stays in the best locations around the world

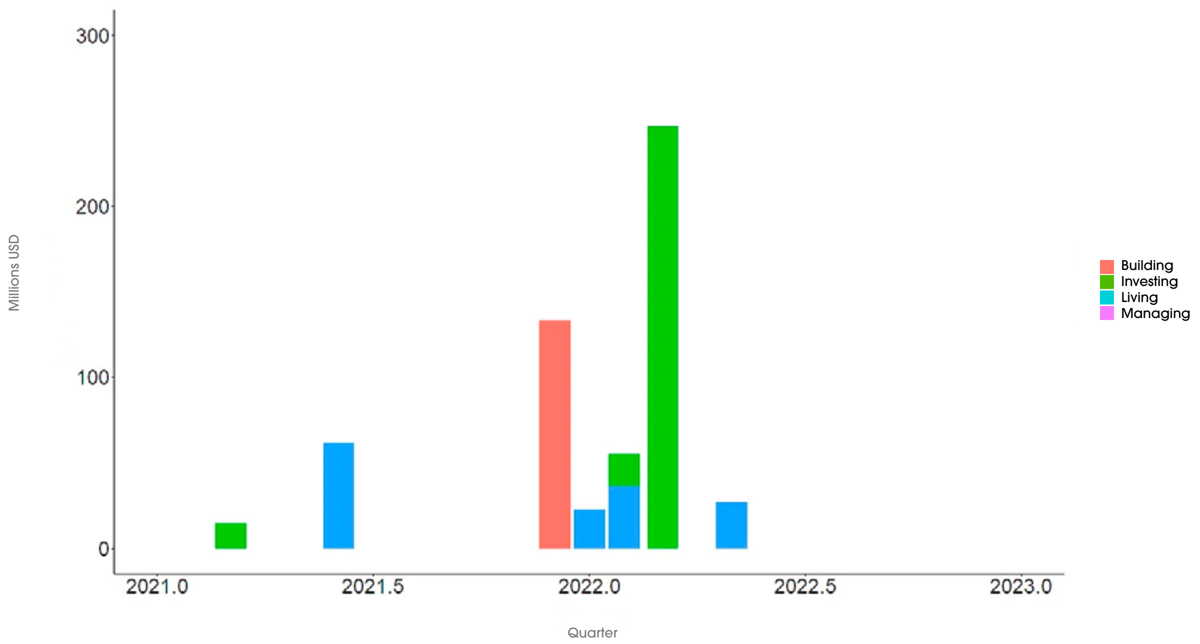
Top Performers

Figure 10: Top 500 PropTech Deals by Category (2022-2023)



The above image shows the Top 500 PropTech Deals by company category for the 2022-2023 fiscal year. Notably, the enormous **Healthcare Trust of America** deal in the Investing category was large enough to outpace the largest deals from the Building and Living category combined. At the same time, the Managing category made up nearly half of the market share. Technologies applied to property management are thus diverse and far reaching, including Better.com and Corporation Services Company – two companies involved in managing very different segments of the real estate market. In addition to the aforementioned deals in the Managing and Living categories, two top deals in the Living and Investing categories are of note. First, Cainaio Network Technology Company is a provider of logistics that operates at the intersections of big data, e-commerce, supply chain technology and PropTech. Their primary technological innovation, however, is their logistics data platform, which offers real time information on shipments in any city in China. Setpoint also utilizes technology to unlock new speed and efficiency, but does so in the Investing space, by digitizing assets like homes, verifying and storing documents, and automizing rate calculations.

Figure 11: Top 500 PropTech Deals by Category and Quarter (2022-2023)



The above image helps aid us in visualizing how the PropTech market transformed over the course of the fiscal year. We see that the largest investing deal, HTA, was really quite an anomaly, although there were also outsized deals in the Managing category in the Fall Quarter of 2022, as well as outsized deals in the Building category in the third quarter of 2022-2023. The Fall of 2022 was marked by a large **Onewo Inc's** IPO deal and a general debt deal for **Emeria Europe**. Onewo Inc is a property management service provider in China, leveraging various technologies to better assign office spaces, manage commercial complexes, and even industrial parks and public premises. The company's predecessor was the property services segment of the major Chinese firm, Vanke. By contrast, **Emeria Europe** emphasizes leveraging technology in the aid of managing residential properties for the sake of owners, tenants, and commercial clients in Europe. By the end of 2022 and the first months of 2023, Vanke, also known as **China Vanke** was on the map again, as the large residential developer announced it was in talks to secure CNY 15 billion from yet undisclosed investors in one of the most substantial PIPE deals in the Building category.

Another major deal was an early stage VC round of funding to support the growth of **Gropyus**, an Austrian company that designs buildings as continuous evolving products, emphasizing both affordability and sustainability in their construction. However, that investments dropped off in terms of number across all categories from the middle of the Winter Quarter of 2022-2023 through the Spring Quarter of 2023, as geopolitical stressors and market pressures amidst a series of bank failures would begin to worry investors.

Chapter 3:
The Global PropTech Industry

4
CATEGORIES

7,691
COMPANIES

16,865
INVESTORS

$408.82
BILLION RAISED (2000-2022)

95
COUNTRIES

Overview

This chapter focuses on the global PropTech industry with an increased eye toward long-term trends. In the first section we provide an overview of the global industry, before diving into an assessment of five year trends, and then concluding with a long-view of comparisons between leaders who have emerged in the past decade with those who have emerged in the past fiscal year.

Industry Trends

We have better data on emerging markets in this year's barometer when compared to previous years. **This year, we found 7,691 companies had raised $408.82 Billion USD with the help of 16,865 investors from 95 countries** between 2012 and 2023. In previous PropTech Barometer reporting, we found just 2,405 companies raised $74.2 Billion USD from 1,809 investors in 66 countries between 1999 and 2021. Even still, improved data cannot account for all of the changes. Therefore, we attribute the significant difference to a combination of our improved dataset and the growth of the industry, especially as PropTech has begun to work in ever increasingly in developing markets, particularly in the People's Republic of China and India, as well as their neighbors. With each passing year, the spread of technology into real estate markets is penetrating further than before.

7,691
companies

95
countries

Our current data indicates PropTech investors have hit record highs in recent years. There were more than three thousand active investors in the 2022-2023 fiscal year, substantially down from the more than four thousand active investors recorded in the 2021-2022 fiscal year. Nevertheless, examining the long-term trends of investor make-up suggests the field of investors remains quite healthily diverse.

Additionally, although **the vast majority of investments occur in the United States and the People's Republic of China**, followed by European countries like the United Kingdom, France, and Germany, we see emergent PropTech markets in new countries. In Latin American markets like Colombia, Peru, and Brazil join Southeast Asian markets like Singapore, Vietnam and Indonesia, along with African markets like Nigeria and South Africaand Southwest Asian markets like Israel, the UAE, and Turkey in becoming innovators in the PropTech industry. In future years, we may look to such countries as leaders in their regions, and even, possibly, the global PropTech community.

Figure 12: Global Distribution of PropTech Investments

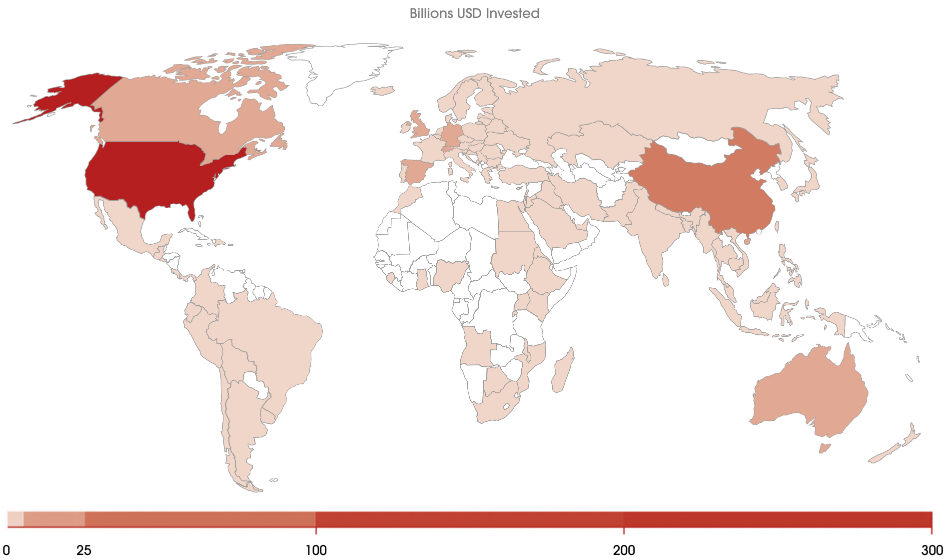


Figure 13: Global Distribution of PropTech Investments excluding USA

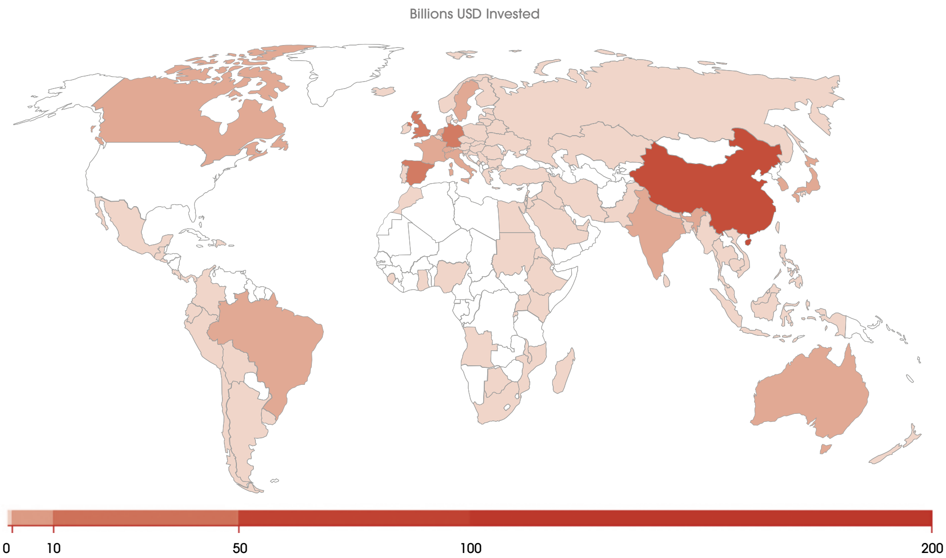


Figure 13 the global distribution of PropTech investments excluding the United States, to give us a better sense of the current top investment markets. Of course, we should not be surprised to see the People's **Republic of China (PRC)** at the top of the list, along with the **United Kingdom** - since London is often referred to as the capital of global finance. Then, we find **Germany** – the European Union's largest market as measured by GDP – and Switzerland, an established and well-known market for global finance.

Figure 14: Top Investor Countries (2012-2023)

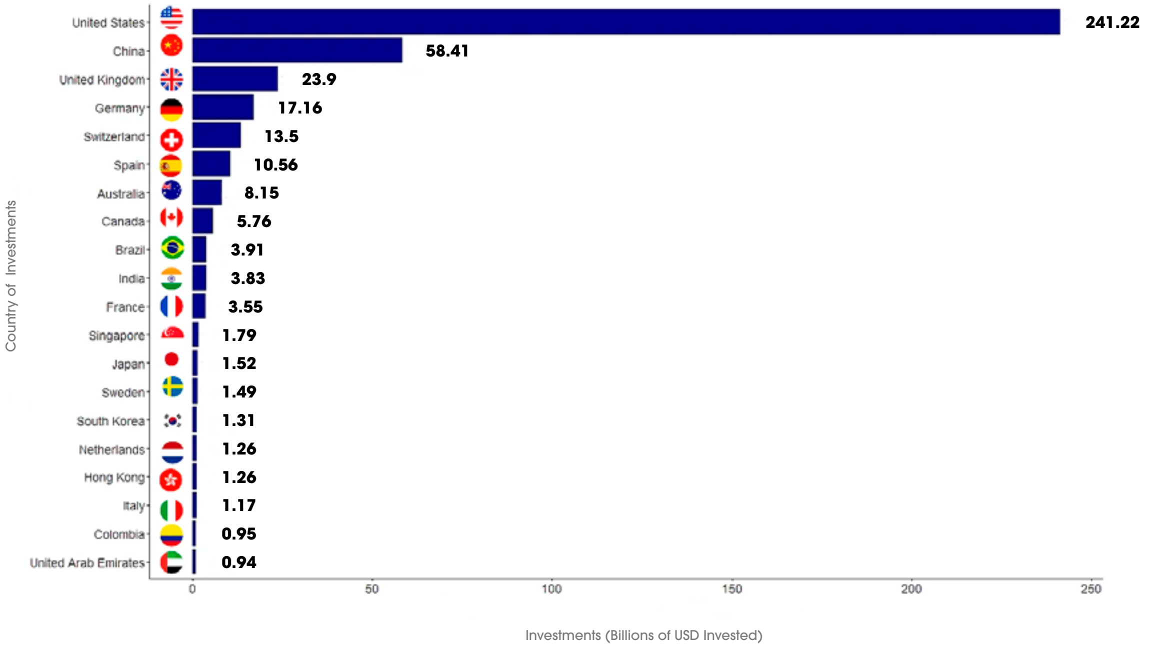


Figure 14 shows the bar graph of the top countries in terms of PropTech investments from 2012 through 2023. **The top five include Spain** (attracting $990 Million USD in investments in the 2021-2022 fiscal year and a total of $10.56 Billion USD since 2012), **Switzerland** ($13.5 Billion USD), **Germany** ($17.16 Billion USD), the **United Kingdom** ($23.90 Billion USD), and **China** ($58.41 Billion USD). Other important markets include Australia ($8.15 Billion USD) and Canada ($5.76 Billion USD). Another tier of countries, including Brazil, India, and France, have attracted between $3 and $4 Billion in investments in the past decade, while a third tier of countries, including Singapore, Japan, Sweden, South Korea, Hong Kong, the Netherlands, and Italy have attracted between $1 and $2 Billion in investments. Finally, the countries that have attracted more than $100 Million in investments, but less than $1 Billion, are quite diverse, including Israel, Colombia, Lithuania, Austria, Mexico, Indonesia, Vietnam, Portugal and South Africa.

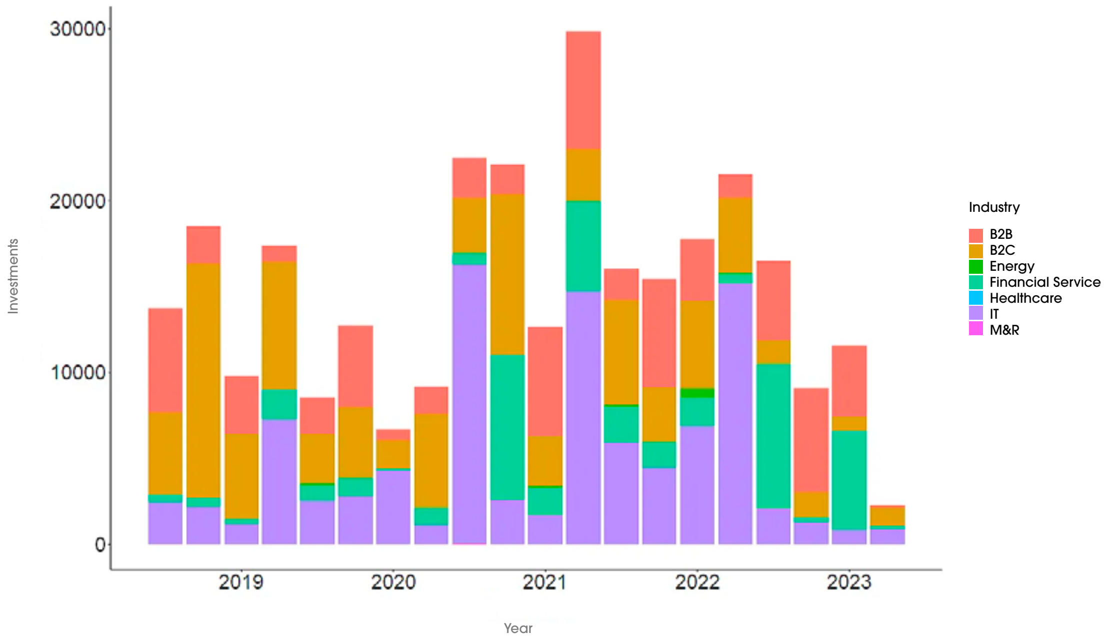
$58.41

Billion USD

$23.90

Billion USD

Figure 15: Investments by PropTech Company Sector (2018-2023)



Over the course of the past five years, the shape of PropTech investments by company category has changed substantially. Beginning this measurement in Q3 of the calendar year in 2018, B2B companies attracted the most capital, with more than $6 Billion USD. **However, the longer term trend is for B2C PropTech companies to attract more investments, totaling over $86 Billion in the five year period and Information Technology (IT) companies attracting over $96 Billion in investments.** Overall, the data also suggests there is a close relationship between the number of deals by company category and the capital invested, especially since Information Technology and B2C companies had the largest number of deals during the five year period in question, with 152 and 167 deals respectively.

$86

Billion USD
B2C PropTech companies' investments

$96

Billion USD
Information Technology (IT) companies' investments

Five Year Trends

Figure 16: Investment Received by Company Category and Company (2018-2023)

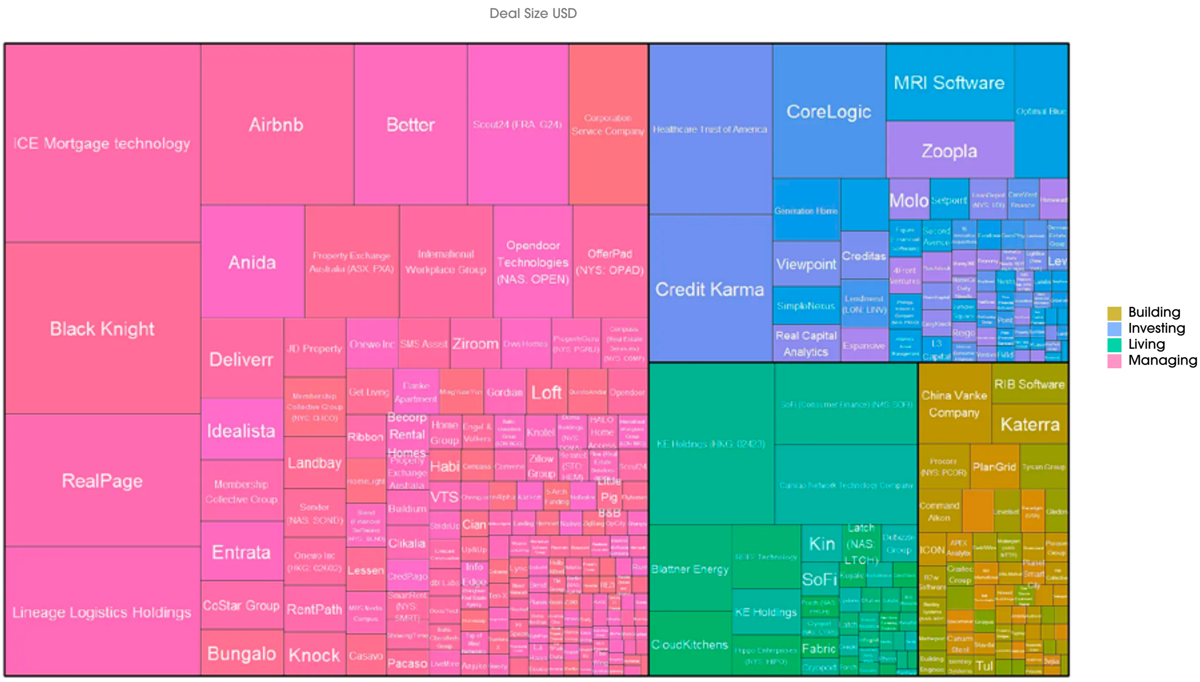


Figure 16 is an illustration of the investments received by individual companies completed deals and their categories to give a bit of a long term perspective on the Global PropTech market. Here we see that major players from this past year, such as **China Vanke** in the **Building category**, **HTA** in the **Investing category**, **ICE Mortgage Technology** in the **Managing Category**, and **KE Holdings** in the **Living category** are also among the top fundraisers of the past five years.

Overall, the Managing category of PropTech companies are still seeing some of the largest and most significant deals, in part because this may well be the market segment that has most readily adopted to the digital transformation. The relative financialization of the US and UK markets, coupled with the innovations of FinTech, help to explain why Investing has been the consistently second most substantial category. The data illustrates that the technological revolution may still well have the greatest space to innovate, diversify, and disrupt the Living and Building spaces, as these are the spaces where the least disruption has occurred in the real estate market - relatively speaking - thus far. However, with interest rates relatively high in many markets, it is unclear at present what forms of financing will take over, although there is a pervasive sentiment that leveraged buyouts and debt financing are on the decline in the current cycle.

vanke

Also known as "China Vanke", Vanke is a impressive developer of real estate in 60 Chinese cities, especially in the Pearl River Delta and Yangtze River regions, having expanded to Hong Kong, the United States, the United Kingdom and Malaysia. They are a promoter of green development, emphasizing the construction of green buildings through improvements in waste management, green supply chains and technology innovations, valuing wetland conservation and sustainable urbanization. The company also utilizes its resources to conduct biodiversity research in the process of planning construction processes.

ICE Mortgage Technology

ICE Mortgage Technology is a leading cloud-based provider for the mortgage finance industry, emphasizing the digitization of workflows throughout the origination process.

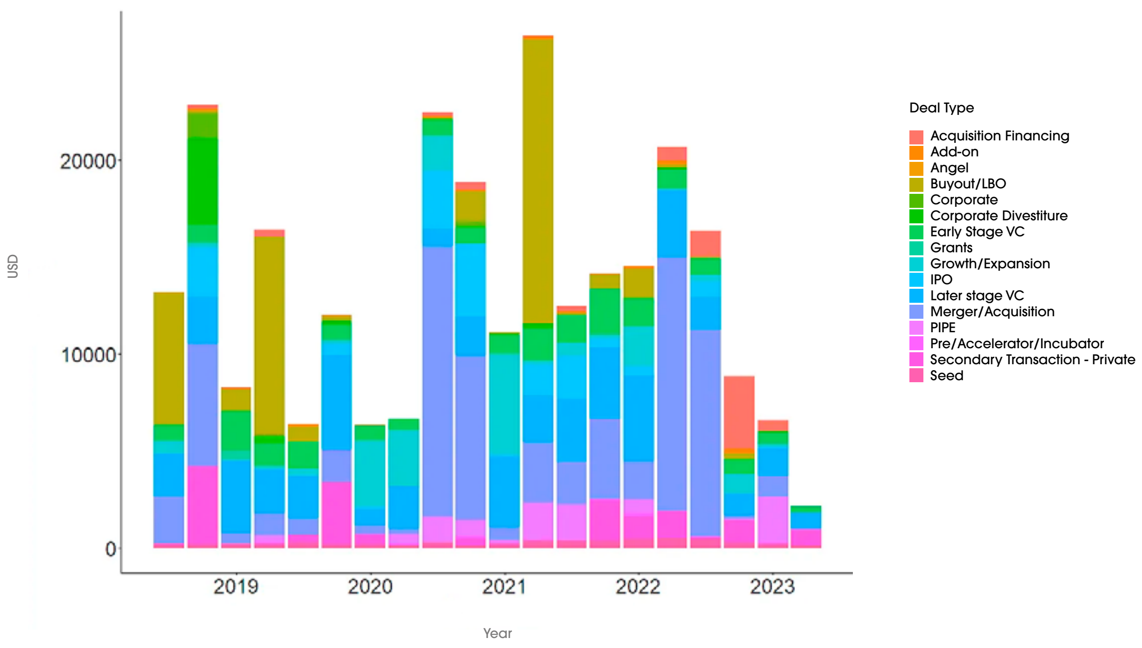
HTA
Healthcare Trust of America, Inc.

HTA is a real estate property investment company that focuses predominantly on medical office buildings, healthcare related facilities and commercial properties. HTA has been the largest owner and operator of medical facilities in the United States, leveraging big data and bespoke software solutions to aid the management of these precious assets

贝壳
找房大平台
KE Holdings

KE Holdings builds relations between service providers and customers. They have grown through providing connections to facilitate home renovation and refurnishing, as well as other services, having grown from the initial seed of Beike, an online platform for hew home sales and rentals operating primarily in the Managing category.

Figure 17: Capital Invested by Deal Type (2018-2023)



Overall, the vast majority of deals covered by the press reporting on the PropTech industry are large Mergers & Acquisitions or significant VC funding. The data also supports this focus, since Mergers & Acquisitions represented the most significant capital invested by deal type in the past five years, totaling over **$73 billion in M&A deals, representing 25.49% of all deals.** A second tier of deals, being Growth/Expansion, IPO, Private Secondary Transactions, Reverse Mergers, and Prive Investment in Public Equity (PIPE) deals remain quite significant, as each of these categories represents more than **$10 billion of financial deals, and together they represent 29.63% of all deals.** By the time the trend of market consolidation emerged, as we had predicted in last year's barometer, and by the end of the 2022 calendar year, deals were significantly smaller in the PropTech industry. **As of the first quarter of the 2023 calendar year, Reverse Mergers, strikingly, became the largest category of deals, totaling over $5.18 billion**, while PIPE and Later Stage VC deals remained significant, totaling over $2.36 billion and over $1.39 billion respectively. We take the data that M&A dropped to just around $1.07 billion of all deals as a further sign that we have entered a period when the market consolidation has already occurred.

$73

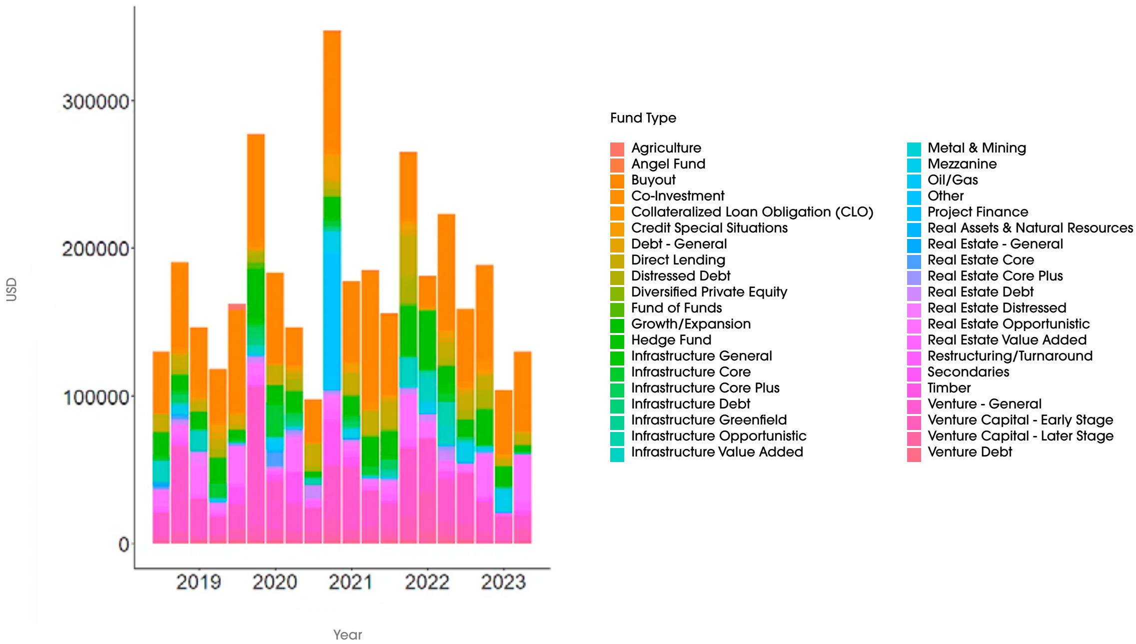
Billion USD
M&A deals

=

25.49%

of all deals

Figure 18: Total Cap Raised by Fund Type (2018-2023)



Over the past five years, examining the total capital raised by fund type in the PropTech industry provides important insight into the financial dealings of an industry that is typically described as one of the least transparent in the business world. **The top five categories of funds during the period in question were Buyout funds, Venture - General funds, Growth/Expansion funds, Real Estate Opportunistic Funds, and Direct Lending**. Of these, Buyout funds totalled over **$1 Trillion**, while Venture - General funds totalled around $606.29 billion. Growth/Expansion funds totalled around $330 billion, and Real Estate Opportunistic funds totalled around $228 billion. Finally, Direct lending funds totalled around $196.56 billion. This overall picture is very different from that which emerges when we examine the key quarters of Q3 2020, Q4 2020, and Q2 of 2021, when compared to Q1 of 2023.

$1
TRILLION
Buyout funds

Ten Year & Past Year Comparison

Figure 19a: Top 10 PropTech Companies by Amount Raised to Date (2012-2023)

Lineage	$ 10.22 Bn	airbnb	$ 9.05 Bn
贝壳 找房大平台 KE Holdings	$ 8.82 Bn	vanke	$ 8.38 Bn
pendoo	$ 5.43 Bn	CSC	$ 4.85 Bn
SoFi	$ 4.37 Bn	mri REAL ESTATE SOFTWARE	$ 4.06 Bn
CoStar Group	$ 2.79 Bn	MARKETTECH	$ 1.63 Bn

In our final assessment of the global PropTech industry update, we aim to highlight the top companies in the industry, as measured by their fundraising. If we examine the past decade of the industry, we have some major players, who will also be quite familiar to followers of the PropTech Industry. For instance, Lineage Logistics has raised an impressive total of over $10 billion USD, while the American giant AirBnb has raised over $9 billion. Two Chinese companies, **KE Holdings** and **China Vanke**, each come in with over $8 billion in total fundraising, while **OpenDoor** has raised a total of $5.43 billion. Then we have three companies that have raised between four and five billion USD: **CSC** ($4.85 billion), **SoFi** ($4.37 billion), and **MRI Software** ($4.06 billion). Finally, **CoStar Group** ($2.79 billion), and **Market Tech Holdings** ($1.63 billion) round out the list for the top fundraisers in the past decade. However, if we narrow the list to just those fundraisers that were active in the past year of 2022-2023, we see a distinctly different list, especially since AirBnB and OpenDoor do not represent major fundraisers in the current market. Thus, **Reef Technology, Generation Home, Figure,** and **JD Property** are all on the top ten list of to-date fundraising, as measured by fundraisers active in the 2022-2023 fiscal cycle. Each of these companies features particular technological solutions that help explain why they have reached the top of the list.

Figure 19b: Top 10 PropTech Companies by Amount Raised to Date (2022-2023)

Lineage	$ 10.22 Bn	贝壳 找房大平台 KE Holdings	$ 8.82 Bn
vanke	$ 8.38 Bn	CSC	$ 4.85 Bn
mri REAL ESTATE SOFTWARE	$ 4.06 Bn	REEF TECHNOLOGIES	$ 1.70 Bn
GEN H	$ 1.62 Bn	FIGURE	$ 1.47 Bn
JDP 京东产发	$ 1.38 Bn	CSC	$ 1.30 Bn

Among the top all time PropTech fundraisers still quite active in the 2022-2023 cycle, **Reef Technology** is particularly important. The company is working to help transform urban landscapes, through adopting unused urban spaces to current needs. Consider the example of parking lots. These physical spaces create massive urban heat islands and often go at least partially, if not mostly unused. They are essentially single-use spaces. However, they can be transformed into multi-use places through integration with technology that connects restaurants, airports, hotels, warehouses, and more to popular brands. Each of these businesses would gain value through the interaction, while the investor in the formerly-single-use parking lot also increases their revenue stream. They additionally install "Food Hall" panels, which are quick-service interaction panels for customers in high-traffic areas, such as university campuses, urban mega-malls and shopping centers, sports stadiums, airports, and more.

While Reef Technology focuses on the fundamental transformation of public urban and commercial spaces, **Generation Home** is providing new technological solutions for the process of mortgage lending in England and Wales, where they utilize a combination of cutting edge UI and data management software to facilitate the entire experience of home purchasing, from formulating a budget, through the mortgage application and approval process, conveyancing, remortgaging, moving, and more. Their "**Income Booster**" interface allows clients to easily add family members (parents, grandparents, siblings, aunts, or uncles) who are helping to purchase a home through gifts, which will help the applicant borrow more, although the "Income Booster" will not live in the home. Typically, this process includes letters, signatures, and forms which all must be completed in-person or sent via e-mail, in a fashion where the data stored is not particularly secure.

Importantly, in the case of Reef Technology's lending models, the "Income Booster" is also distinct from the "**Deposit Booster**" – an unlimited number of friends or family who can contribute toward the deposit and downpayment of a home. Here, a "Deposit Booster" is different from an "Income Booster" in that the pot of money is structured so the individual(s) contributing toward the deposit will get a small amount of their initial contribution back later, while also allowing for parents to support more than one child with the same pot of money. Finally, "**Dynamic Ownership**" allows for co-investment with up to five (5) other parties, allowing each individual to build equity in a property. Here, Generation Home's technological contribution is through creating software that allows clients to easily track contributions and share of the home over time.

At the intersection of PropTech and FinTech, **Figure** (Financial Software) is a private company founded in 2018 by Mike Cagney (who also founded SoFi), with some 53 investors and just over five hundred employees. Based in San Francisco, the company is transforming the trillion-dollar financial services industry by exhibiting the latest in combining the technologies of blockchain, artificial intelligence, and advanced analytics to facilitate the management of digital assets. Figure's platform specializes in home equity release services, including home equity lines of credit, home improvement loans, and home-buy-lease back offerings for retirement. Additionally, Figure also offers business solutions through their platform "Figure Pay" which is a Banking as a Service (BaaS) API-based platform, also built on blockchain rails, or networks of how payments move from payers to payees, offering extremely secure transactions.

While Reef Technology, Generation Home, and Figure all emphasize the intersections between B2B and B2C interactions, **JD Property** is a major Chinese innovator in infrastructure and B2B interactions, with eight significant investors, including BlackRock and GIC (a Singapore-based Sovereign Wealth Fund). JD Property aims to create intelligent industrial parks and energy systems through merging solutions from renewable energy and smart technology. By doing so, they enable their clientele with the ability to create sustainable and efficient production environments. While the technologies they utilize might not be adoptable to economies of countries with less emphasis on manufacturing and production, it is still important to remember that these environments are another area where PropTech is providing vital solutions to today's most pressing challenges.

Chapter 4:
The PropTech Industry by Regions

Overview

This chapter considers the PropTech industry by regions. We begin with an in depth focus on the United States, before moving toward an examination of key markets in Europe, including France, Spain, and Germany. We then conclude the chapter with an examination of the PropTech market on the continent of Asia, where there has been substantial growth in recent years in developing markets.

The United States: A Once and Future Innovator

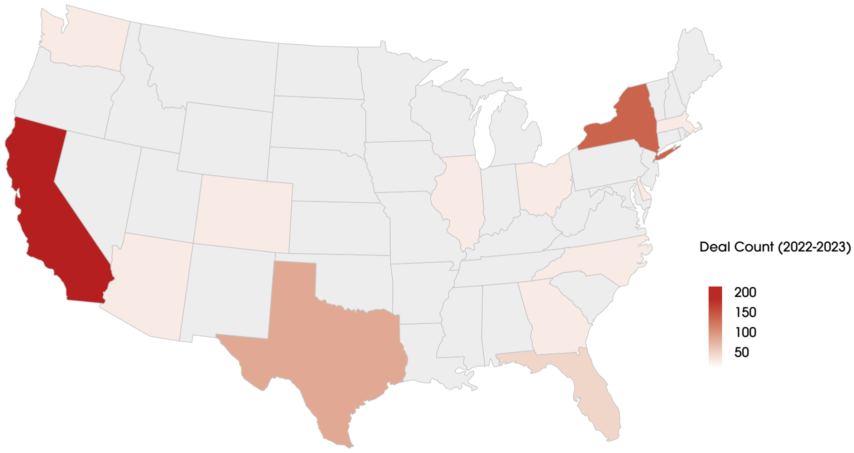
4
CATEGORIES

857
COMPANIES

1,510
INVESTORS

$32.80
BILLION RAISED (2000-2022)

Figure 20: Deal Count by US States



The past year in the American PropTech Industry is best characterized by a long-predicted period of market consolidation, while economic pressures, including a raising of interest rates and concerns over recessionary pressures, led to a substantial decline in the number of investors when compared to the previous fiscal year. However, 2022-2023 was still a packed fiscal cycle in terms of the number of deals made. The American West Coast is commonly thought of as the origins of the PropTech industry, although the oldest and very highly valued market of New York was not far behind. Some **236 deals** by 196 companies were completed in California in the past fiscal year, making up 26.19% of the market and there were **140 deals** by 125 companies in New York, representing 15.54% of the market. Texas (80 deals) and Florida (50 deals), although only about half as active, also represent significant areas of growth and deal making for the PropTech Industry in the US. Furthermore, states like Massachusetts (30 deals) and Illinois (28 deals) represent areas where growth and consolidation of PropTech companies shows that these companies are tapping traditionally highly valued real estate markets. States like Colorado, Arizona, Georgia, Ohio, and North Carolina do not represent major active markets for deals and consolidation currently. Arizona, after all, had just 15 deals last year. That said, if we look at the capital invested in these deals, we might see some surprising upsets from year-on-year trends.

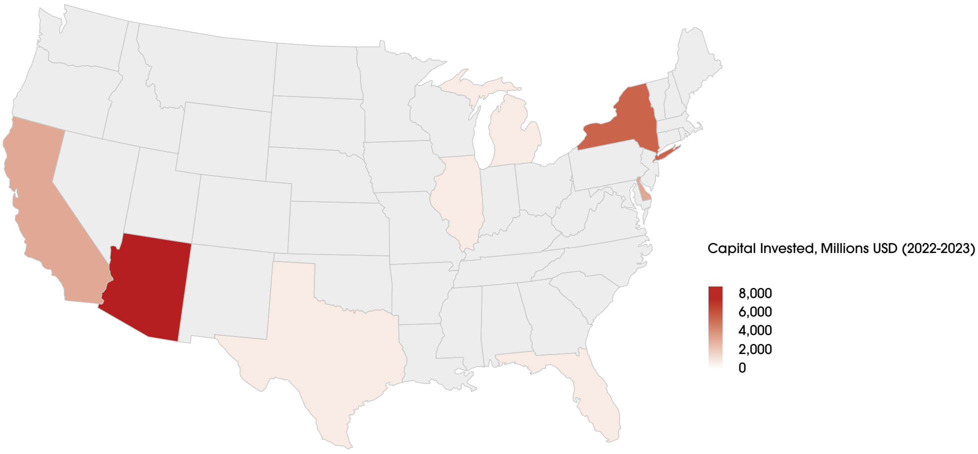
26.19%

California

15.54%

New York

Figure 21: Capital Invested by US States



When we control the count of deals for the shear amount of capital included in the agreement, California slides quickly from the top state in the past fiscal cycle. Indeed, **Arizona reaches the top of the list, with $8.61 Billion USD or 26.92% of the market share**, across the just 15 aforementioned deals. Most of this capital is accounted for through the Healthcare Realty Trust acquisition of Healthcare Trust of America, which was completed in July of 2022. The acquisition brought together two of the largest owners of medical office buildings in the United States. **New York then follows Arizona, with 20.84% of the market and a total of $6.66 Billion USD**. Of course, the most significant deal in New York State is Better's recently announced reverse merger to acquire Aurora Acquisition for $5 Billion USD, which will put the company's post-money valuation at $7.7 Billion USD. Next, **Delaware makes up 15.28% of the market with $4.89 Billion USD**, predominantly accounted for by two General Debt deals associated with Corporate Services Company (CSC). CSC received a senior secured term loan B, a line of credit, and a secured term loan A from major corporate banks, totalling $3.48 Billion USD, intended to fund future acquisitions. We are already seeing these funds have an impact on the future of PropTech, as CSC completed a November 2022 acquisition of Dutch-rival Intertrust Group for $2 Billion USD. Notably, among Intertrust Group's expertise is a specialization in Real Estate Accounting. Further, since CSC's specialties include fiduciary and governance support, as well as legal compliance and transaction consulting, it is unquestionable that they will continue to be a player in the PropTech space.

26.92%

Arizona

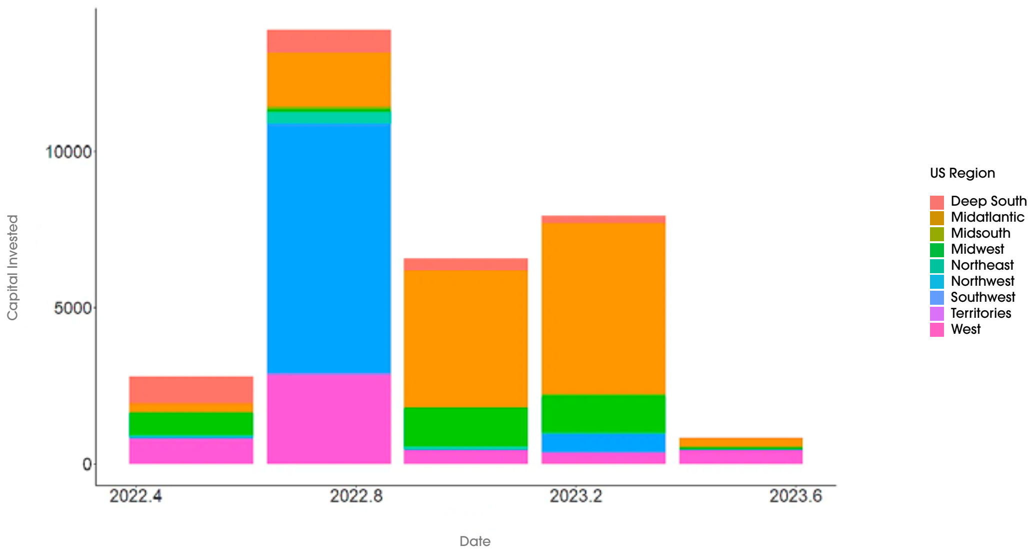
20.84%

New York

15.28%

Delaware

Figure 22: Top 500 Deals, Capital Invested, Quarter, Region

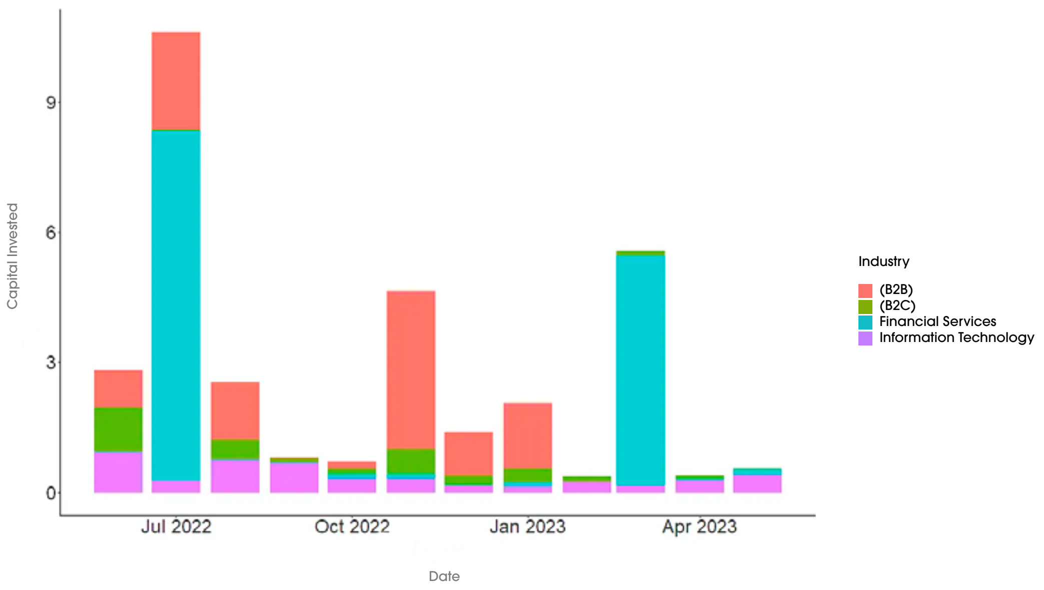


When we examine the amount of capital invested in deals in the United States per region and by quarter, it becomes clear that the West Coast, despite being the primary region of technological innovation in the United States, no longer accounts for the most capital involved in deals. Indeed, but for the aforementioned Healthcare Trust of America deal, which is located in the Southwest region, much of the deals are concentrated in the MidAtlantic states of New York, Pennsylvania, Delaware, and Maryland. **The two major deals in the past cycle in the West were accounted for by Deliverr and Homelight**.

Both San Francisco-based, Deliverr was acquired by Shopify for $2.1 Billion, while Homelight raised $478 million through a combination of debt and Series D venture funding in June of 2022, before the also received a $500,000 growth capital loan and a $500,000 unfunded commitment from TriplePoint Venture Growth in December of 2022, totaling $1 million in debt financing in their second major deal of the year.

In the Midwest, the most significant deals are accounted for by Lineage Logistics Holdings, which is a provider of warehousing and temperature-controlled logistics facilities designed to lessen environmental impact and minimize supply chain waste. In 2021, Lineage Logistics had a total of eight (8) active or pending patents for apparatus or arrangements taking/viewing photographs (1), system regulation and control (1), image data processing/generation (1), refrigerators (1), transportation/storage devices (1), one other patent, and an impressive three patents for information and communication technology specially adapted for administrative commercial, financial, managerial or supervisory purposes. They then leveraged these technological advancements to secure $500 million in a Revolving Credit Line and a $700 million term loan to support future acquisitions in June of 2022. This capital was then followed by a $700 million PE Growth/Expansion deal backed by Private Equity in December 2022 to support the completion of a global pipeline of more than 20 in-flight greenfield and expansion projects. Although there were some significant deals in Texas, Florida, and New Hampshire this past year, as we can see, the Northeast, MidSouth, and South in the United States are still a bit less developed in the PropTech space. Gradually, however, as more companies are expected to emerge in Florida and Texas, we may see a reallocation of capital to these states as well.

Figure 23: Top 500 Companies by Deal & Primary Industry Vertical



When we break down the capital invested by PropTech category and date over the course of the past fiscal year, we can observe some interesting trends. First and foremost, it is clear that those deals involved in Financial Services are still the most significant individual deals in the year, being represented by the aforementioned Healthcare Trust of America and Better deals. The next most significant deals are all in the B2B category of companies. These include the Corporation Services Company, Deliverr, and Lineage Logistics Holdings deals. They also include **Lessen**, an operator of a property services platform that aids the management of real estate assets, based in Scottsdale, Arizona. Lessen raised $500 million in venture funding via a combination of debt and equity in January of 2023 to support the acquisition of SMS Assist, which was completed in the same month for $950 million.

As **SMS Assist** has been a provider of business services intended to deliver unprecedented transparency and control within the facilities maintenance industry, based out of Chicago, Illinois, the deal also represents the potential re-adjustment the multi-polar nature of the American markets, with markets in the "Smile States" (Arizona through Texas and Florida) becoming more significant. Two examples of "Smile State" companies, both of which are B2C category

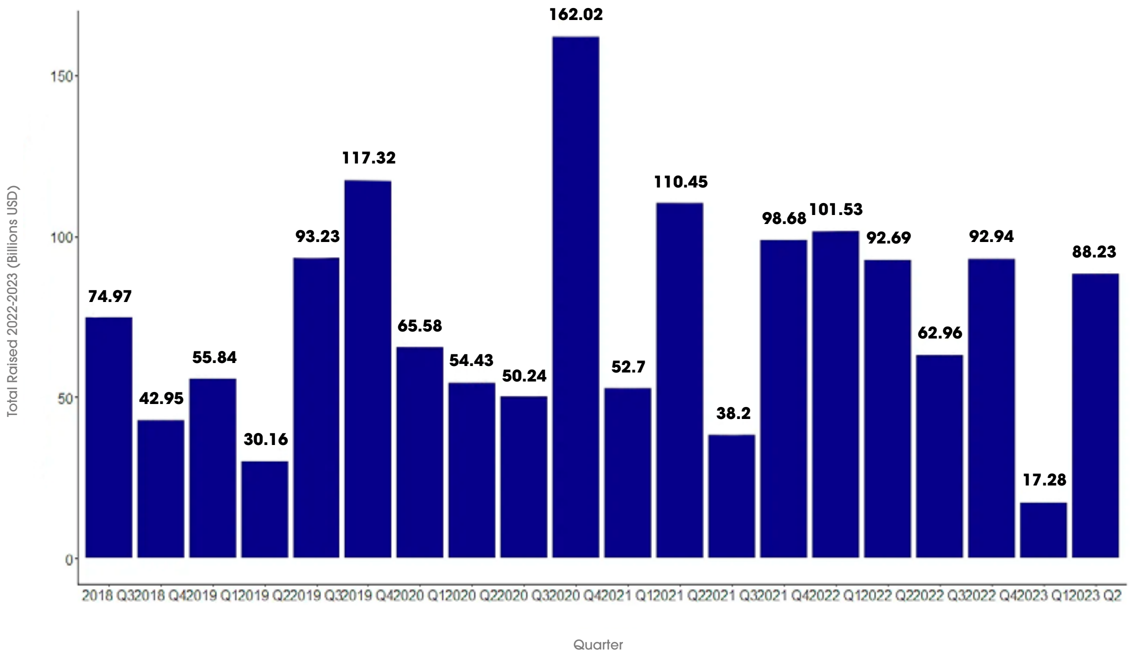
Lessen

sms assist

setpoint

companies, are **Setpoint** (based in Austin, Texas) which received both Seed Round and Early Stage VC financing this past year, and **Flow** (based in Miami, Florida), which received Early Stage VC Financing. That said, the greatest number of deals is still, by far, in the Information Technology category, which make up a total of 47.60% of all deals in the past fiscal year, but just 14.95% of the capital invested. This dynamic is likely because small startups still dominate the investing space of the Information Technology sector. Thus, deals are smaller, but dispersed much more evenly throughout the year.

Figure 24: Total Capital Raised by Quarter (2018-2023)



In recent news in the PropTech industry, there were many concerns as Quarter 1 of the 2023 calendar year represented the worst financial quarter out of the past twenty, with just $17.28 Billion USD, compared to an all time peak of $162.02 Billion in Quarter 4 of the 2020 calendar year. However, when the Quarter 2 2023 reports came in, the numbers were surprising. Quarter 2 of the 2023 calendar year ended with $88.23 Billion USD raised, which was just under the Quarter 2 totals for 2022 and 2021, being $92.69 Billion USD and $110.46 Billion USD respectively, but greater than the total of Quarter

2 2019 ($30.16 Billion) and Quarter 2 2020 ($54.43 Billion) combined. However, by the more recent quarters, smaller deals Information Technology make up for much of the count, which represents a distinct dynamic from earlier quarters. That said, these "smaller" deals can remain quite significant, such as SafeAI's recent raising of $68 million in Series B venture funding as of May 29, 2023. Since **SafeAI**, based in Santa Clara, CA is focusing on developing autonomous heavy equipment technology to supplement the mining and construction industries, their business model operates at the intersection of Artificial Intelligence, Autonomous cars, Big Data, Construction Technology and Mobility Technology, bringing all these developments together under a single company that is transforming the world by allowing operators to retrofit heavy vehicles and site operations with autonomous technology, enabling safer and more productive websites. Simultaneously, they are also lessening the environmental impact of the AI-transition, as allowing retrofitting makes it possible for owners and operators of heavy machinery to adopt and transform their present machines, rather than dispose of them.

Figure 25: Top PropTech Companies in US by Total Raised

Lineage	$ 10.22 Bn	CSC	$ 4.85 Bn
mri REAL ESTATE SOFTWARE	$ 4.06 Bn	REEF TECHNOLOGIES	$ 1.70 Bn
FIGURE	$ 1.47 Bn	insurity	$ 1.17 Bn
Better	$ 1.13 Bn	Offerpad	$ 0.79 Bn
HomeLight	$ 0.75 Bn	knock	$ 0.74 Bn
ribbon	$ 0.68 Bn	setpoint	$ 0.67 Bn
PLUM	$ 0.63 Bn	KIAVI	$ 0.60 Bn
homeward	$ 0.50 Bn	roofstock	$ 0.48 Bn
Deliverr	$ 0.45 Bn	EasyKnock	$ 0.45 Bn
VTS	$ 0.44 Bn	Pacaso	$ 0.44 Bn

Among the top American companies active in the past year, we see some familiar players rise to the top when we rank them by total finances raised. **Lineage Logistics is by far the top company, with more than $10.2 Billion USD raised**. Then Corporation Services Company comes in second with $4.85 Billion, quickly followed by MRI Software, a provider of real estate and investment management software to owners, investors, and operators, based out of Solon, outside of Cleveland, Ohio came in third, with just over $4 Billion USD raised to date. While their work includes automation in the areas of financial operations, they also complete strategic planning projects, operate in commercial management, and work in compliance management for affordable housing, public housing, voucher management, waitlist management, and asset management. Additionally, in June 2023, MRI Software Launched a commercial tenant porthole, which allows for easy access to billing, payments, and online service requests. In the second tier of companies, we have Reef Technologies, Figure Financial Software, Insurity, and Better, all of which raised between $1 and $2 Billion USD. In a third tier, we find OfferPad, Homelight, Knock, Ribbon, Setpoint, Plum, Kiavi, and Homeward, having raised between $500 million and $1 Billion USD all time. Finally, a fourth tier rounds out the top twenty companies by all-time fundraising totals, with Roofstock, Deliverr, EasyKnock, VTS, and Pacaso all having raised between $400 and $500 Million USD. A significant portion of these companies are in our Financial Services Category. Notably, MRI Software, Better, Figure, Insurity, Plum, Kiavi, and Easy knock are all operating at the intersection between PropTech and FinTech.

Lineage

$10.2

BILLION RAISED

Figure 26: Top PropTech Companies by Last Financing Size

Better	$ 5,174.2 M	CSC	$ 3,556.5 M
sms assist	$ 973.9 M	Lineage	$ 717.9 M
Lessen	$ 512.6 M	flow	$ 360.5 M
B2W SOFTWARE	$ 339.9 M	HILL Hill International	$ 204.7 M
Landing	$ 169.4 M	BILT REWARDS ALLIANCE	$ 167.3 M

When we adjust our parameters to highlight the most significant companies in the United States by last financing size, we see that the top five deals are those including Better, Lineage Logistics Holdings, Corporation Services Company, SMS Assist and Lessen. **Each of these has achieved significant financing, landing between $500 Million USD and just over $5 Billion USD in the past fiscal year.** The rest of the top ten are made up of Flow (Real Estate Services), B2W Software, Hill International, Landing, and Bilt Rewards. Flow, which received both Seed Round and Early Stage VC financing this past year, is a provider of rental-housing experiences and services to outside developers, with the aim of helping customers to decrease their living costs. For instance, they aim to provide equity and concierge services for renters, while providing management services for third party landlords. The company is one of the latest projects of famous founder, Adam Neumann, of WeWork fame, and raised $350 million in venture funding from Marc Andreessen of Andreessen Horowitz in August of 2022. **Flow** aims to serve Nashville, Tennessee, Atlanta, Georgia, Miami and Ft. Lauderdale in Florida, thus bringing PropTech to

flow

several markets which had not been served directly by the tech boom in previous years. The company, thus, is a direct consumer-facing company that will serve an underserved market of renters in southeastern American cities.

While Flow emphasizes consumer interactions, two of the remaining top ten PropTech companies in the US from 2022-2023 by last financing size service businesses more directly. **B2W Software**, based in the historical manufacturing hub of Portsmouth, New Hampshire, is a developer of unified heavy construction software for the building industry, while **Hill International** (acquired by Global Infrastructure Solutions in December 2022), provides projection management and consulting services for building, transportation, environmental, energy and industrial markets. The remaining two companies of the top ten PropTech companies by last financing in the United States provide solutions to problems in the existing rental market. Bilt Rewards is a Financial Software company that enables renters to earn rewards points by paying rent. The rewards can then be used on airline travel, at partnered hotels, toward future downpayments for purchased property, and more, providing one possible solution to move toward home ownership. Finally, Landing operates an online marketplace for furnished apartments. Currently helping consumers find short and long-term furnished stays in Atlanta, Birmingham, Dallas, Las Vegas, Los Angeles, Denver, and Austin, Landing has emphasized the emerging markets of the "Smile States," although they have also tapped into Chicago, one of the traditionally strong real estate markets of the Midwest. We find a similarly robust mix of B2C, B2B, Information Technology and Financial Services companies in Europe in this years' barometer as well.

Europe: A Focus on the Future

“While it’s true that technology and innovation has been far more fueled in the U.S. and the U.S. has been the driver for some time, there are some areas where the European market has been more advanced than the U.S. One example is sustainability.”

Tanguy Quero
Investment Principal, JLL Spark

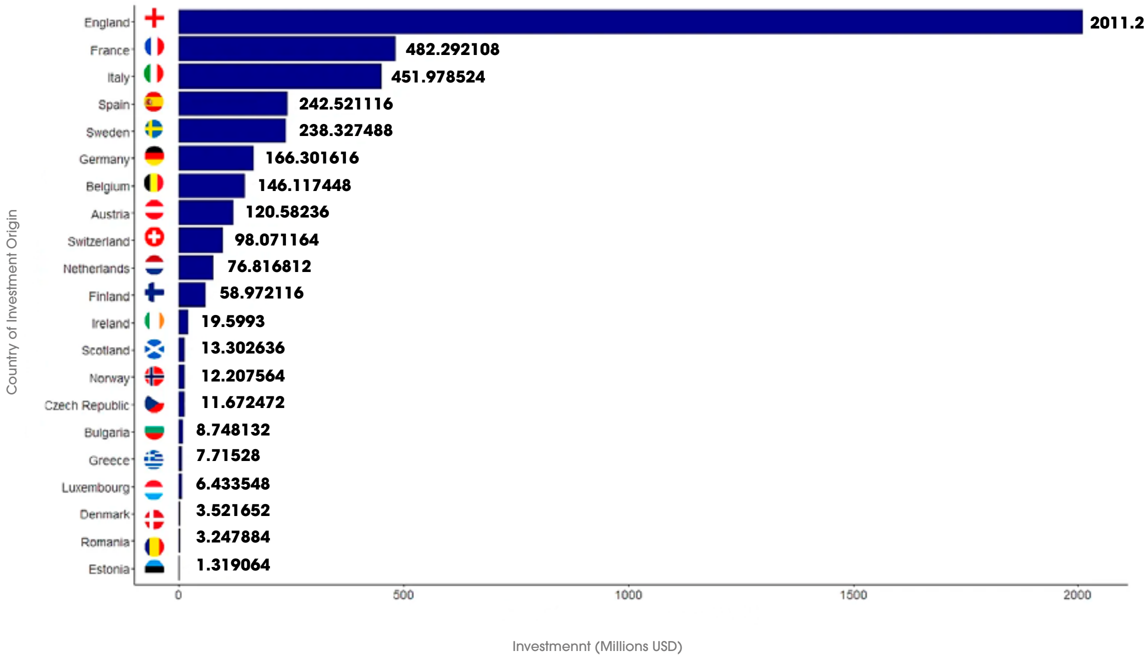
Watch the interview

The past decade of PropTech in Europe has seen a few powerhouse countries rise to the top of the list: **England, France**, and **Germany**. These three markets are among the top five PropTech markets almost every year. In 2020, a shakeup and massive amount of capital raised in Belgium allowed the Belgian market to break into the top five. Sweden, much like Spain, has had occasional moments in the sun among the top five. However, after an initial burst in 2014, the Spanish market has been growing steadling. Similarly, Italy, Austria, Switzerland, and the Netherlands are often near the top of the list. However, the dispersal of capital is quite uneven. An expanded list of the top 500 deals, aggregated by European country, from the past fiscal year reveals some interesting trends about the European market. While more than **$2 Billion USD was invested in PropTech in England in the 2022-2023** fiscal cycle, the numbers for France and Italy, while still significant, were less than half that of England, coming in at $482.29 Million USD and $451.98 Million USD respectively. The third tier, including Spain and Sweden, raised between $200 and $300 Million USD. The remainder of the top ten, including Germany, Belgium, Austria, Switzerland, and the Netherlands, all raised between $50 Million and $200 Million USD.

$2

BILLION
invested in PropTech

Figure 27: Top 500 Deals Aggregated Investment by European Country (2022-2023)



While the top ten countries in Europe aggregated by investment in PropTech companies from 2022-2023 contains few surprises at the top of the list, in that the English market is the most substantial, and other substantial markets for investments tend to be located in Western Europe, when we expand the list to the top twenty countries, a few surprises emerge. One might expect Scandinavian markets, like Finland and Norway, to be not far behind Sweden. Similarly, one might expect small, but relatively wealthy, Western European markets like Ireland, Scotland, and Luxembourg. The Czech Republic might enter one's might, as a market in close proximity to those of Austria and Switzerland, as well as of a comparable size. However, Romania, Greece, Bulgaria, and Estonia are not likely to be high on the list of mentions for promising PropTech markets. Yet, in each case, between $1 Million USD and $10 Million USD were raised in the past year in these countries. In Bulgaria, Telelink Infra Services provides infrastructure services, while Maistor Plus provides a platform for home renovation and interior design services and FlatAway provides professional serviced apartments for long-term stays. Tallinn, Estonia is home to several Information Technology companies, including EstateGuru, Redin, HotelBuddy, and AuFort. While these markets appear small currently, they could represent the greatest opportunities for new growth for the PropTech industry in terms of applications of existing technological solutions to aging real estate markets.

FRANCE

PropTech in France is a more significant market than Spain, with 102 companies participating in **109 deals with thanks to 191 investors, and $5.48 Billion USD in investments**, when we count every company with an office in France. Even when we limit the search to those headquartered in France, we have 87 companies who have completed 93 deals with thanks to 171 investors, and $482.29 Million USD. To explain the distinction in these measures: in the first measure, we would include major companies like the Corporation Services Company (USA), Infogrid (UK), Badi (Spain), and Housing Anywhere (the Netherlands) among the top ten fundraisers in France, as they have offices there. However, if we exclude companies that have their headquarters abroad, we have top French B2C companies like Colonies, Proiprioo and Masteos, Financial Services companies like Clubfunding Group, and the Information Technology company Matera as the top five fundraisers as of the past fiscal cycle.

Figure 28: Top Deals in France (2022-2023)

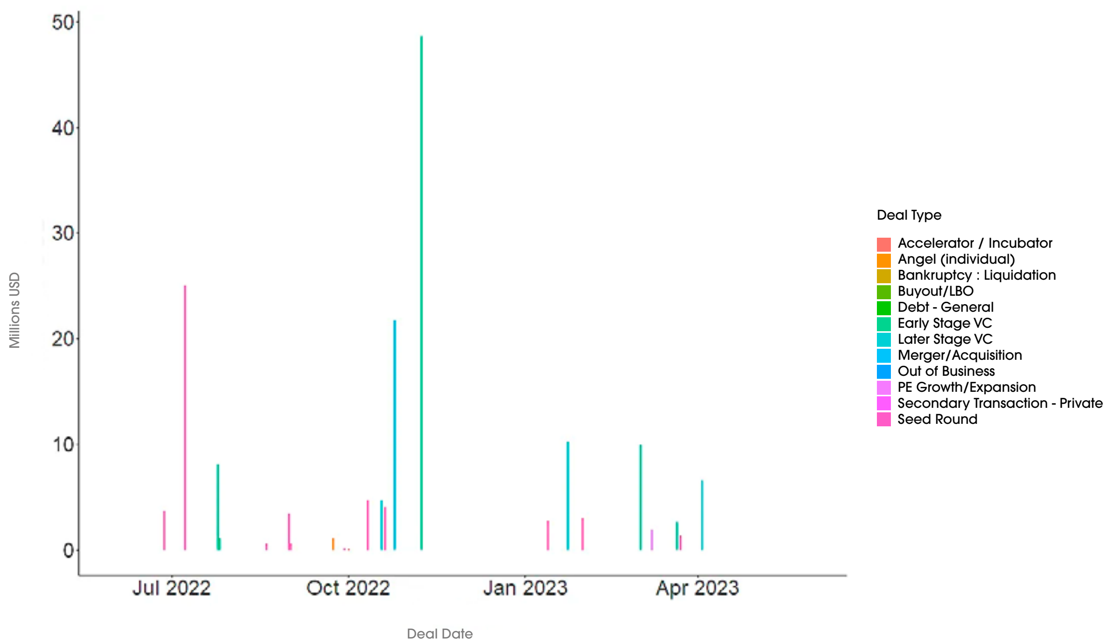


Figure 28 shows the top deals in France by type and date for the past fiscal cycle. More than one quarter of the capital invested in the deals (28.94%) was located in Growth/Expansion, while just under one quarter (23.69%) was allocated to Early Stage VC and around one-fifth (20.71%) was allocated to Later Stage VC deals. Seed funding deals made up under ten percent

(9.06%) of the capital invested, with a small remainder being Angel (1.44%), Pre/Accelerator/Incubator (.38%) and Grants (.02%). LBOs and Buyouts, which we have been watching for as a sign of market consolidation, reached 15.76% of the capital invested in deals in France in the previous cycle. Among the most significant deals were **Clubfunding Groups**' PE Growth/ Expansion $134.07 Million USD deal including injections of development capital from Peninsula Capital, EMZ Partners, Florac, and Bpifrance in September 2022. The explicit aim of this deal was for the company to establish itself throughout Europe.

$134.07

MILLION

Next, **Masteos** - a developer of a real estate management platform completed two important deals, including an injection of Equity Crowdfunding of $1.78 Million USD in Jan 2023, which was then presumably quickly put to use as the company secure a larger Early Stage VC (Series A) venture funding in a $57.34 Million USD deal led by EDF Pulse Venture in March 2023. The next most significant deal was AgoraStore's Buyout/LBO, as the company was acquired by 21 Invest and Bpifrance in a $50 million deal in November 2022. Bpifrance was also a participant in another significant Buyout/LBO deal, this time for Citron, a developer of digital energy efficiency and property management platform designed to help digitize energy and other technical management of buildings. The $21.9 Million USD investment in Citron aims to help the company scale up, recruiting some 200 individuals, which would make the company more than three times its present size, with the investment additionally backed by Entrepreneur Invest and Eiffel Investment Group. Finally, the fifth top deal completed by a company headquartered in France in the past cycle was completed by Garantme, a provider of insurance brokerage services that aims to provide renters access to apartment rentals without needing access to a guarantor, while also providing landlords with security of income. Garantme received a total of $16.46 Million USD in Later Stage VC funding from a combination of Axeleo, Bonsai Venture Capital, 115K, and NewAlpha Asset Management.

SPAIN

During the 2022-2023 fiscal year, there were 58 PropTech companies with offices in Spain, who participated in 61 deals, with thanks to 105 investors and $1.18 Billion USD in investments. However, if we narrow the list to simply include those companies headquartered in Spain, we have 41 companies that participated in 42 deals, with thanks to 59 investors just **$242.52 Million USD in investments for 2022-2023**, meaning that over 25% of the total number of PropTech companies in Spain (167) participated in deals in the past year. What this suggests is that we are still in a relatively early stage of development for the PropTech industry in Spain. Foreign international powerhouses, like Casavo (of Italy) have come to realize the importance of having an office in Spain.

$242.52

MILLION

However, the market is not as heavily financialized, as most fundraising occurs in the Information Technology and Consumer Products and Services (B2C) categories, with a smaller amount of funding raised in Business Products and Services (B2B). That said, there are two companies that are transforming the financial services sector in Spain, Finsolutia and Veltis. Both are platforms that service asset management, leveraging Big Data to assess risk and return.

Most active fundraising in Spain, however, has been in Commercial Property, which accounts for $174.71 Million USD of the market fundraising in the past year. Many of these companies are operators of online search and buy or search and rent platforms, such as Spotahome and Badi. However, we also see innovative companies that cater to specific markets, such as WilGo's "rent now pay later" technology. The aim of Wilgo is to streamline the rental process, by eliminating unnecessary fees and increasing flexibility of payments, thus leveraging technology to make it easier to rent an apartment.

Figure 29: Top Deals in Spain by Deal Type (2022-2023)

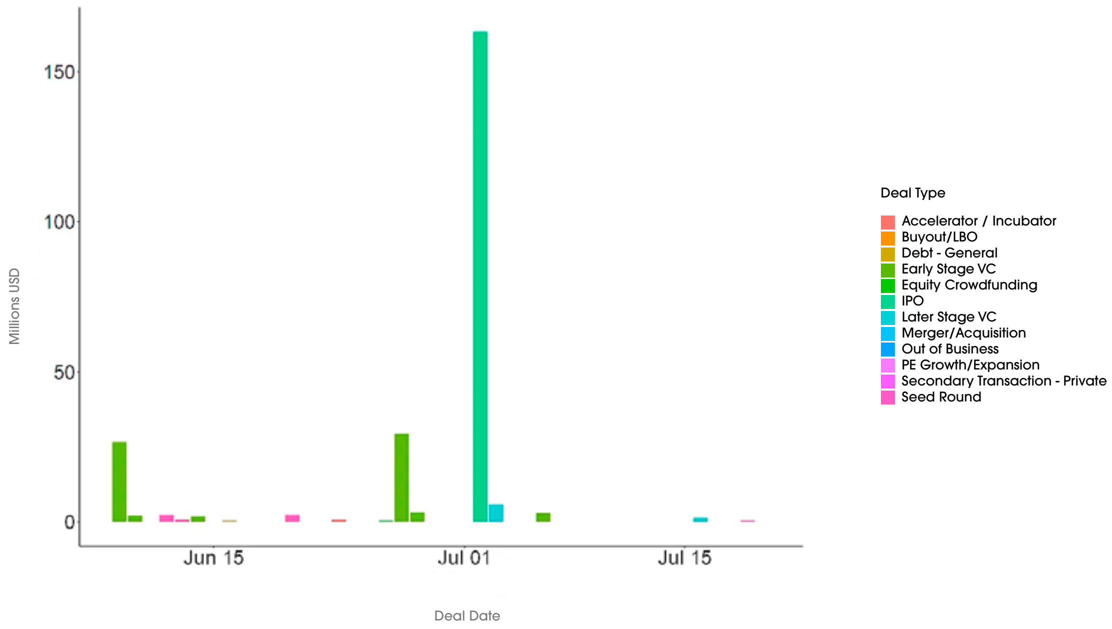
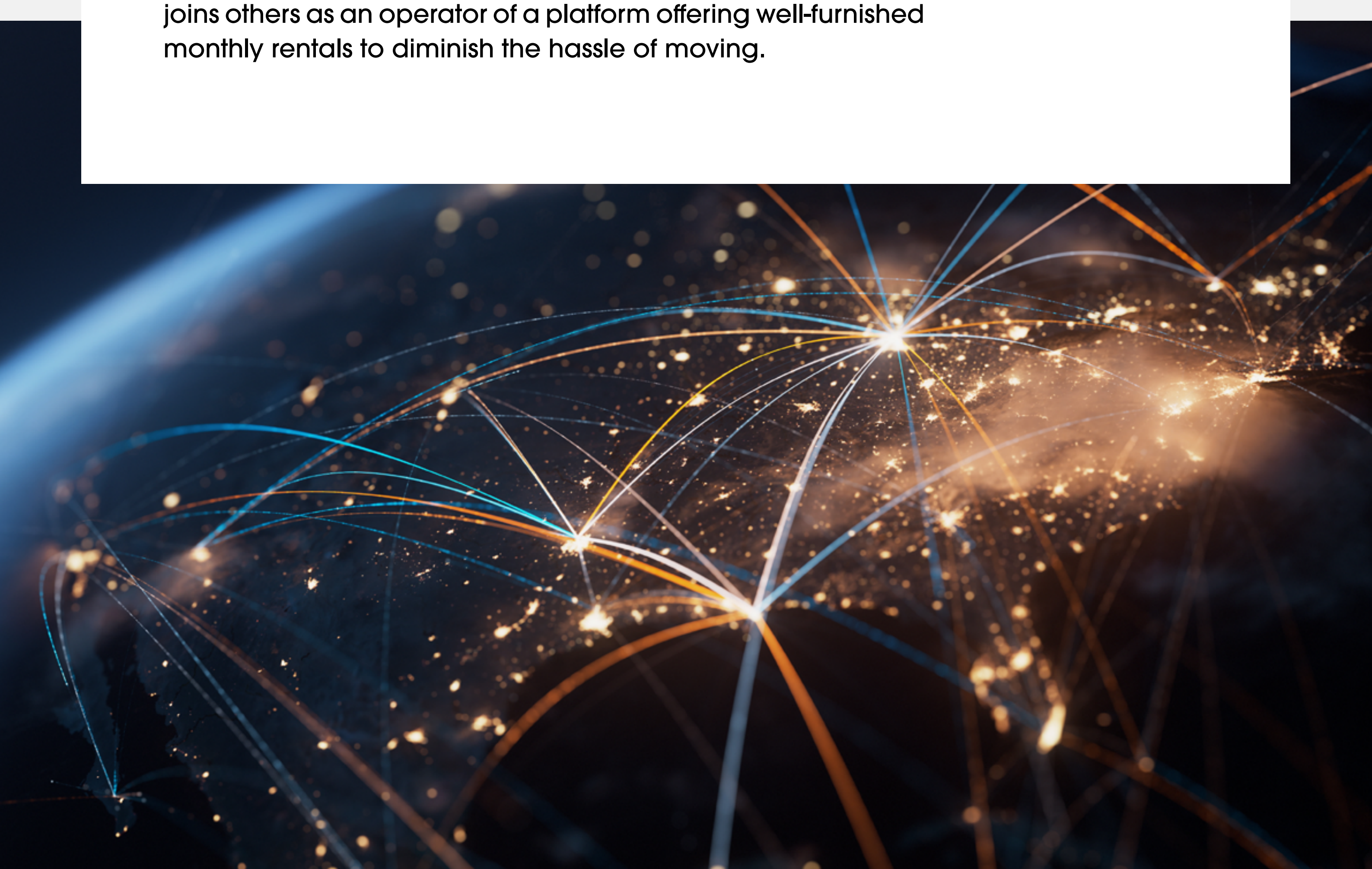


Figure 29 shows the top deals in Spain in the past fiscal year broken down by deal type. As we can see, the most significant deals tend to be forms of VC funding Seed Rounds. However, the largest and most significant deal in the past year was Knowmad Mood's December 2022 IPO. As an operator of consulting and IT Services, Knowmad Mood's software company is intended to help clients transform their services for the digital era. The company helps to bridge one of the most important gaps to cross in terms of the development of the Spanish real estate market. Thus, there is no particular reason to believe the 293.06 Million Euro historical peak of 2020 is the maximum possible investment for this ever-growing and vital sector. As pressure continues to drive innovation, PropTech will likely play an even greater role in responding to the needs of real estate investors. In addition to Idealista and Clickalia – the two giants of the Spanish PropTech industry of previous cycles – another innovator to watch is **Tiko**.

Tiko also works on the iBuy model, like Clickalia, while the medium to long-term furnished rental market is being transformed by Spotahome, Vivla, and Badi. However, each of these latter companies has their distinct contributions. Vivla focuses on providing a fractional ownership of holiday rentals, especially villas, while Badi focuses on a range of long-term furnished apartments in Spain's most popular cities (Madrid, Valencia, Granada, Barcelona, and more). Spotahome, by contrast, is more international, highlighting the potential future trend of Spanish investors profiting internationally through investments in London, Milan, Berlin, Lisbon, and Madrid. Finally, two newcomers, 011hr and Ukio were among the top fundraisers in the Spanish market this past year. 011hr is a provider of design and build services that aim to improve access to affordable, healthy, and sustainable housing. The company emphasizes all elements of construction, from architectural design and engineering, to manufacturing and digital support. The company's last deal was for $26.48 Million USD in Series A funding in June 2022. The company is highly rated in terms of its success probability and represents a promising opportunity for a future Merger and Acquisition deal. Similarly, Ukio, another Spanish company founded in 2020 is also rated as having a high probability of success through a future Mergers and Acquisitions deal. The company joins others as an operator of a platform offering well-furnished monthly rentals to diminish the hassle of moving.



GERMANY

Despite being a larger and more significant European economy, the PropTech industry in Germany is slightly less developed when compared to its neighbor to the West, France. There were **81 companies that completed 84 deals thanks to 174 investors, having raised $5.77 Billion USD** over the 2022-2023 fiscal year. However, if we limit the terms to companies that have a headquarters in Germany, rather than those that have an office, we have 59 PropTech companies, which completed 59 deals thanks to 115 investors, having raised $166.30 Million USD in capital. Thus, it is arguable whether or not the German market is more significant than the Spanish market, in that there are more foreign companies investing larger amounts of foreign capital in Germany. However, local capital investments for PropTech companies are more significant in Spain. This may be an indicator of heretofore untapped potentials in Germany, given the size and complexity of the German real estate market.

$5.77

BILLION

"We've continued to use tech to leverage our operations and onboard spaces to our inventory. Our platform continues to keep an ear on the market and support all types of office players...(and) we've acquired new office spaces...(hosting)...brands such as AppsFlyer, Superchat, and Packmatic...As Setting is positioned as both a marketplace player and flexible office space provider, we've been able to adapt-like always- to the ever-changing market demands. Flexibility remains key in both bad times and good times. We will stay true to what we believe in."

Johnathan Teh
Founder, Setting
a leading office marketplace for startups, scaleups, and innovators

Figure 30: Top Deals in Germany (2022-2023)

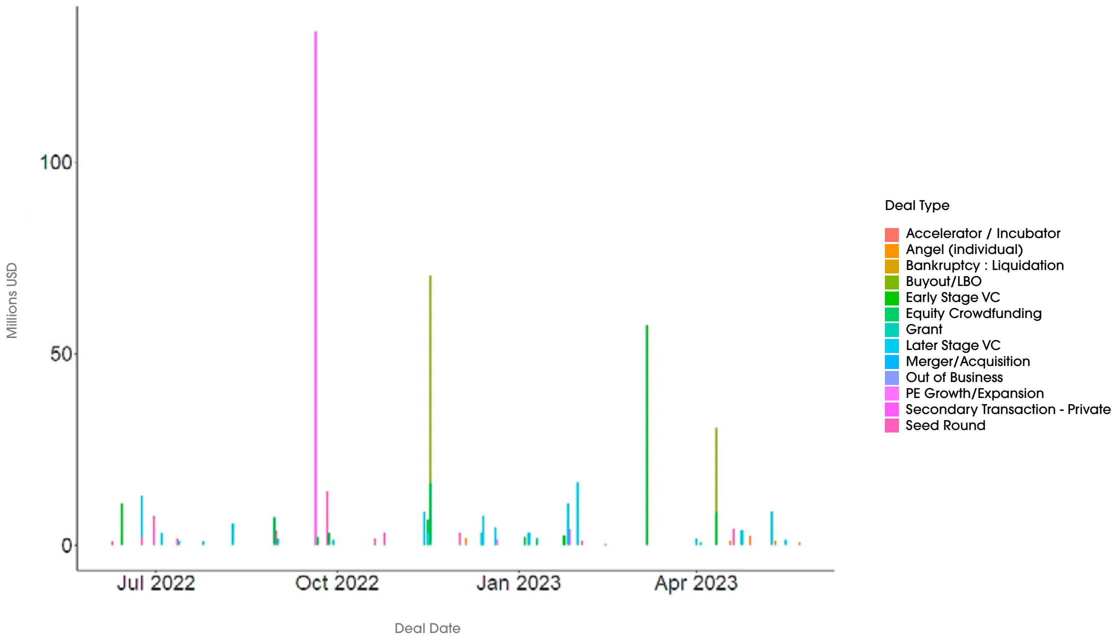


Figure 30 shows the top deals in Germany during the past fiscal cycle by deal type. The most significant amount of capital (42.35%) was invested through Early Stage VC deals, with Later Stage VC deals making up just a bit more than a tenth of the capital invested (12.96%). However, Seed funding, which made up 29.73% of the deals in Germany in the past year, was much more significant than Seed funding in Spain. While there were no significant LBO/Buyout deals of consequence among German companies in the past cycle, Mergers and Acquisitions made up 13.12% of capital invested, with Growth/Expansion (1.16%), Angel (.64%) and Pre/Accelerator/Incubator (.4%) making up the remainder. The major distinction to notice about the German market is the degree to which Seed funding and Early Stage VC funding are making up very significant portions of the capital invested. This suggests that the investors in German markets are already investing the next cycle of market diversification, during a time when market forces are emphasizing consolidation. In other words, these investors are a few steps ahead of the rest of the market.

Among the top fundraising companies in German markets, we find **Limehome**, a developer of an apartment rental platform designed to offer affordable travel stays, founded in 2018, which just completed a $48.63 Million USD venture round in November of 2022. Next, Myne, a developer of a digital co-ownership platform intended to help purchase and manage holiday homes internationally received $25.10 Million USD in July of 2022. In third, we have **Quantrefy**, which has designed an all-in-one ESG platform for real estate companies to calculate ESG scores in real-time, a company that was acquired by Westbridge Advisory for $21.81 Million USD in October in a deal that enabled Westbridge Advisory to strengthen its ESG consultancy offerings. **Apaleo**, a developer of a cloud-based hotel management platform designed to manage multiple properties in the hospitality sector, received a recent Early-Stage VC (Series A) injection of funding from Rockaway Capital and Serpentine Ventures in March of 2023, totalling $9.93 Million USD. Finally, **Kewazo**, which is a manufacturer of robotic elevators providing on-site construction logistics through combining robotics and data analytics completed a Later Stage VC (Series A) $10.27 Million USD deal in January of 2023. However, it is of note that - much like the Spanish market - the German market does not place strong emphasis on Financial Services. Instead B2C (44.45%) and Information Technology (39.68%) make up the largest two shares of capital invested with B2B companies making up the remainder (15.87%). What this suggests is that Financial Services companies based in other countries may be able to expand into the German market relatively easily, given the lack of competition.

Asia: Big Waves in the World's Most Populous Markets

PropTech in Asia has been concentrated in comparatively fewer companies per population, when compared to the United States or Europe. In the 2022 to 2023 fiscal year, there were some **349 companies that secured 393 deals, thanks to 737 investors and $18.06 Billion USD in investments**, if we keep the list of companies expanded to all PropTech companies with offices in Asia. However, if we narrow the list to just those companies with an HQ office in Asia, we see a more focused list of 294 companies, which nonetheless completed a surprising 328 deals, thanks to 604 investors and $6.89 Billion USD in investments. This evidence suggests that a substantial amount of PropTech capital in Asia and companies operating in Asia, especially in East and Southeast Asia, are in fact American companies, such as Better, which operates an office in Gurgaon, Haryana, India.

Although there are certainly increasing numbers of companies realizing it is beneficial to tap into Asian markets, it is also the case that PropTech has grown significantly in the region in the past year and more. Top companies, like **KE Holdings and China Vanke Company have raised more than $5 Billion USD to date**, and more than $1 Billion USD in the past year alone. China Vanke is a major real estate developer in China, with sales putting them at the top of their peer group consistently in the past half decade. Most recently they announced a staggering $2.25 Billion USD in Pipe Funding, which will be used, in turn, for 11 property projects, as well as to boost capital reserves for future projects. While China Vanke is more invested in building, KE holdings is more invested in developing a new online platform for transactions, Beike. Through Beike, they facilitate a wide range of transactions, including new home sales, home rentals, and even home renovations, as well as real estate financial solutions and other services. Just at the start of the fiscal year, in June 2022, when an undisclosed buyer bought a stake in the company as part of a $1.36 Billion USD deal.

393

Deals

$18.06

BILLION
invested

KE Holdings

Figure 31: Total Raised by Company and Category in Asia

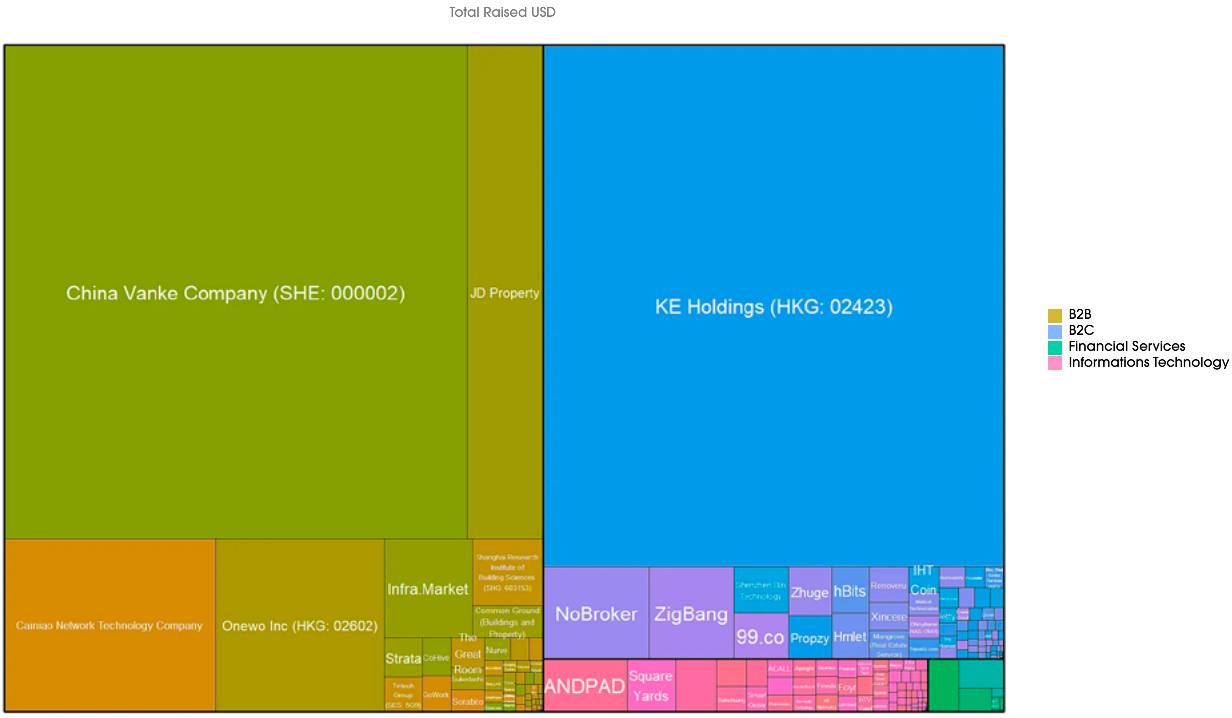


Figure 31 shows the total amount of funds raised by PropTech companies in Asia. Unlike the US, the Information Technology sector is very small in comparison to the giant B2B and B2C sectors. In fact, B2B companies make up the greatest share of the total raised, or 65.23% of the market share. Meanwhile, B2C companies make up 28.55% of the market share. Also significantly, in part because of the dependence on raw materials from Asia, by companies in North America and Europe, it is not terribly surprising to see that there very small portion of the PropTech market that is also directly linked to the Materials and Resources market. Financial services, similarly, makes up a small portion of the PropTech market. This is not to say that the Information Technology or Financial services field in Asian markets are not producing key players. For instance, the top Information Technology company deal in the past fiscal cycle was completed by Andpad, of Japan, a developer of a construction management mobile application, which is designed to update drawings, process charts, photograph site information as inputs, and more, in real-time, to greatly aid the work of on-site supervisors. Andpad just raised a significant $81.57 Million USD in Series D funding to be used for recruitment and training of staff, engineers in particular, as well as to build a global development system, expanding overseas to acquire customers, products, and human resources. Needless to say, Andpad, along with the aforementioned other major players in Asia, will remain companies to watch in the coming cycle.

Chapter 5:
Competing Industries

Overview

This chapter considers PropTech in comparison to competing industries. While we do have an eye toward the market as a whole, **we pay special attention to comparisons between PropTech and 3D Printing, AgTech, AI, Climate Tech, ED Tech, ESports, FinTech, HealthTech, and VR**.

During the past fiscal cycle, we can follow the largest median deal size of competing industries to gain a sense of the way that these industries are subject to a variety of conditions. For instance, it is not a surprise that the competing industry with the largest median deal size in June 2022 was Infrastructure. June is a time when there is much thought put into infrastructure development, in part because planners and investors have a good sense of what can be completed before the coming winter, and therefore what can be planned for the coming calendar years. However, other competing industries are less obviously impacted by annual consumer cycles. For instance, the breakout months for Beauty was October, which is a couple of months before the most significant sales month of that industry, in December. Additionally, **the biggest months for Impact Investing were February and April**. The largest deal for Impact Investing during the year was also, quite notably, within the Climate Tech industry, when **Nextracker secured $602.25 million in a second public offering on the NASDAQ stock exchange**, $518.68 million of which was proceeds.

$602.25
MILLION

Figure 32: Median Deal Size by Month 2022-2023

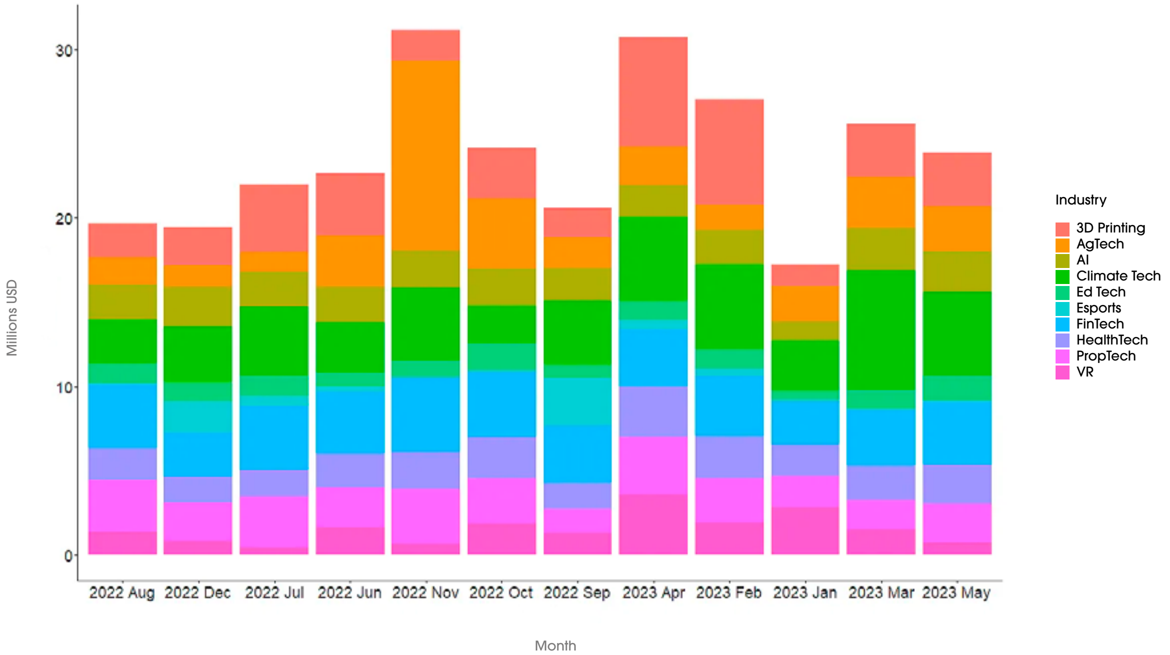


Figure 32 shows the median deal size by industry by month for the 2022 to 2023 fiscal cycle. In this figure, no categories overlap. Our data sorts companies by primary industry and then aggregates the totals by month. What we note is that the PropTech industry has a much more stable month-to-month median investment size, ranging between $1.25 Million USD and $5 Million USD. These indicators suggest the PropTech industry is relatively stable throughout the fiscal year and not so much impacted by consumer spending cycles, when compared to some other industries. In part, this is perhaps because the Real Estate aspect of the PropTech industry addresses a basic human need that is in demand during every month of the calendar year. Yet, another way we might measure relative activity of an industry is by the deal count.

Figure 33: Deal Count 2022-2023

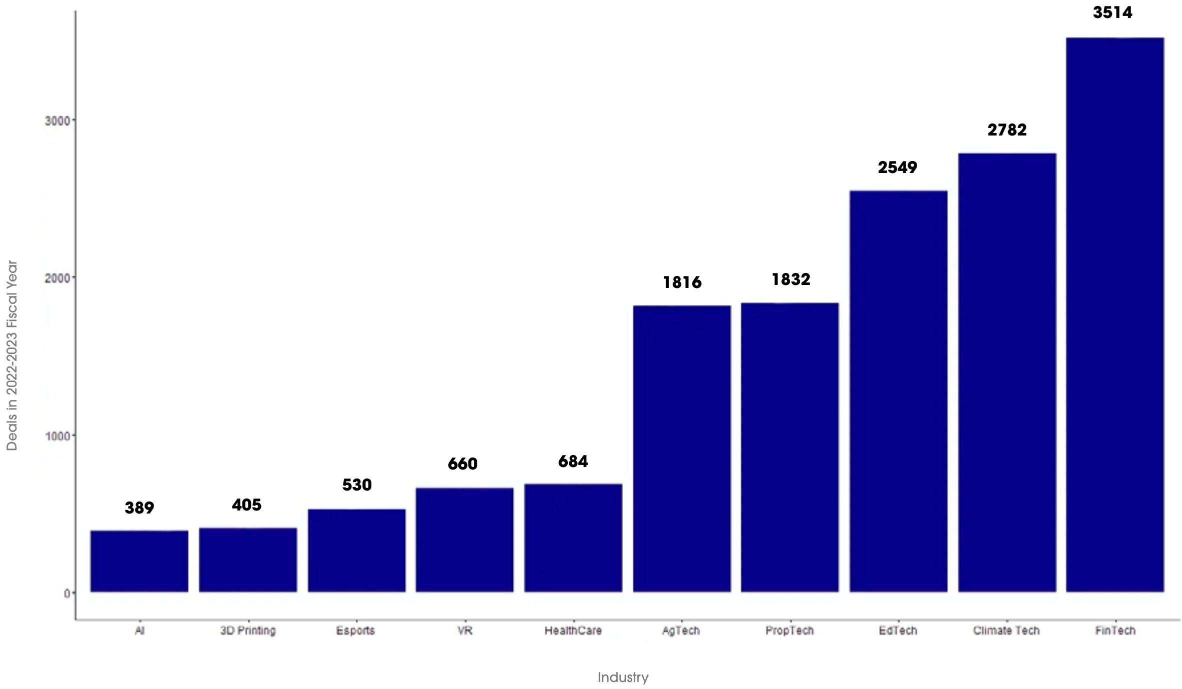
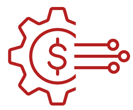


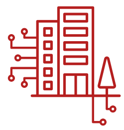
Figure 33 examines several competing industries by deal count for the 2022 to 2023 fiscal cycle, with an emphasis on those most closely comparable to the PropTech market. In this figure, no categories overlap. Our data sorts companies by primary industry and then aggregates the totals number of deals by industry. Overall, the most active industries, naturally, are AI & Machine learning (with over 11 thousand deals) and SaaS (with over 8 thousand deals), along with E-Commerce and HealthTech (With over 6 thousand deals each). PropTech is safely comparable to industries like Digital Health, Cybersecurity, Robotics and Drones, AgTech, and Mobility Tech in its relative activity. In the past year, **PropTech has closely matched AgTech in terms of number of deals completed**. Each of these industries has completed around 1 thousand five hundred to 2 thousand deals in the past fiscal cycle. We see PropTech is far above markets like Healthcare Tech, VR, ESports, ED Printing, and AI. At the same time, we see the marketplace is slightly less active than EdTech, Climate Tech, and FinTech during the past fiscal cycle. These numbers, in part, signal a changing landscape for technology investments in the past 20 years.



FinTech

Climate Tech

EdTech



PropTech

Figure 34: Top 500 Deals, Select Competing Sectors, 2002-2023

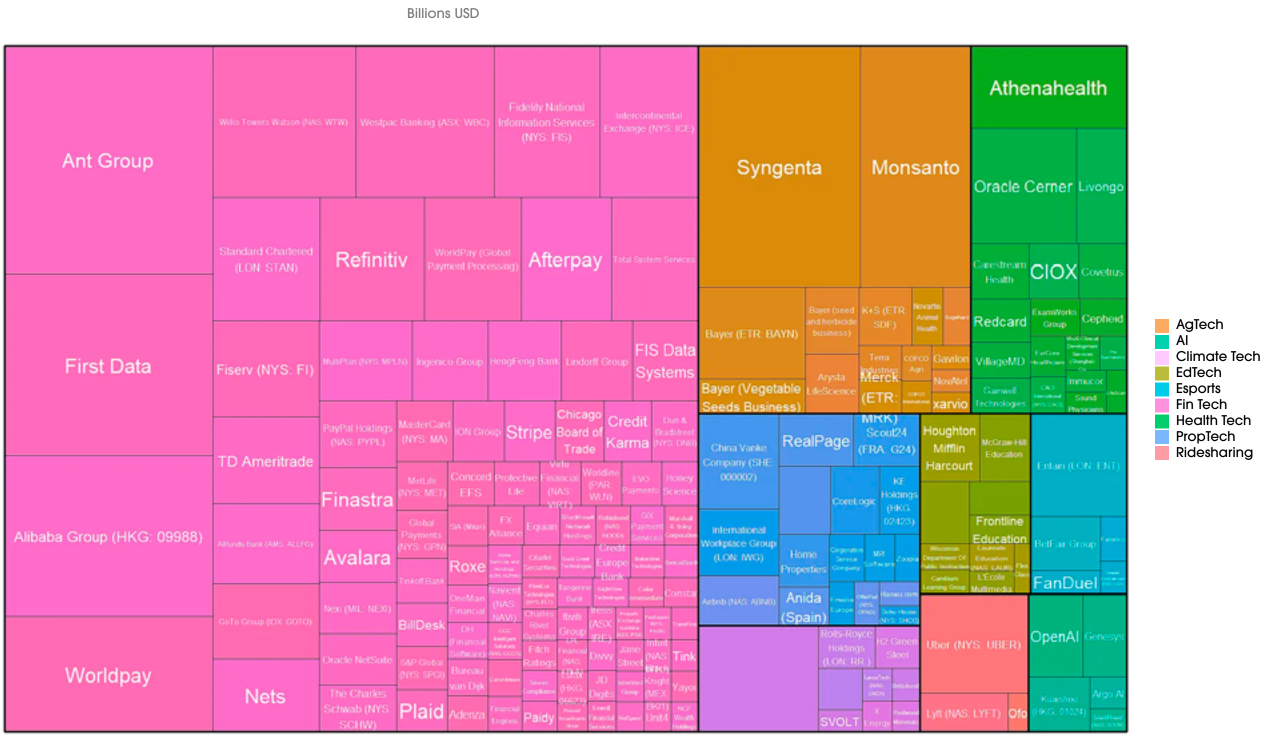


Figure 34 shows the top 500 deals of some select competing sectors in our dataset in the past twenty years. What we see from this data is that the really big deals in the period from 2002 through about 2009 were mostly in Manufacturing, with some significant deals in AdTech, TMT, and Life sciences. In the years immediately after the Global financial crisis, AdTech had a few breakout deals, including **Facebook's (now Meta)** IPO in 2012. Then, by 2015, markets had clearly recovered, and we saw enormous M&A deals in AgTech, with **Monsanto** and **Syngenta**. **Dell EMC**'s Buyout/LBO was brought Cybersecurity to the fore in 2016, which is significant because **VMWare**'s M&A deal announced in May 2022, represents the single largest deal in the dataset at **$70.42 Billion**, although it is closely followed by **Activision Blizzard**'s announced/in-progress M&A in the gaming industry. By far, the most significant deals were in the FinTech space, which accounted for more than half of the top segments of the market share.

In the FinTech space, the market was dominated by just a few companies at the top, including **Ant Group**, **First Data** and **Alibaba Group**. Ant Group, for instance, has raised over **$80 Billion USD** to date, and just secured $6.5 Billion of debt financing to help the company achieve net zero by 2030. As an operator of a cloud-based financial platform, the company's platform provides digital payment tools, including for government affairs and small businesses. By single deal size, the next largest deal was completed by **First Data**. Even though first data has raised significantly less over the lifetime of their company, their impressive sum includes the **$46.47 Billion** acquisition deal by **Fiserv** in 2019. With such massive deals being completed in the FinTech space, it is not a surprise to see FinTech deals were among the top deals completed by companies in competing industries. Indeed, FinTech remains the most significant share of the market. At the same time, Climate Tech deals and AI deals were much more significant this past year when compared to the long term trend.

Figure 35: A Selection of the Top 500 Deals in the Past Year by Competing Industries

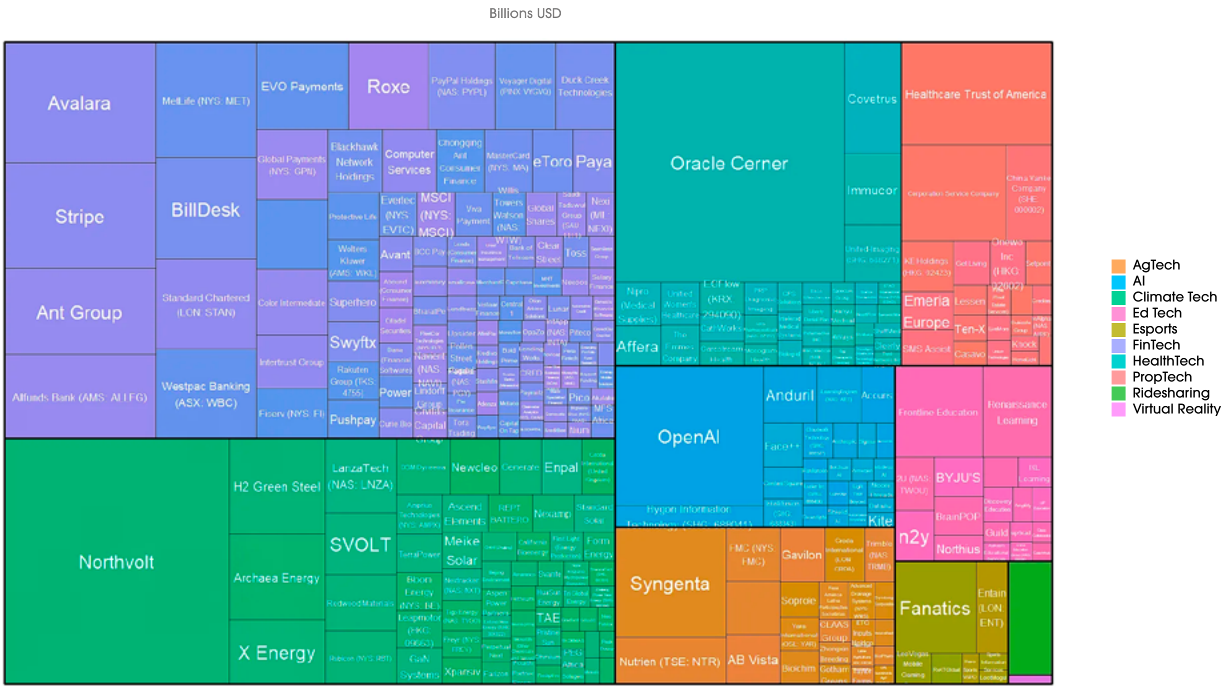


Figure 35 shows a selection of the top 500 deals in the past year, among competing industries. The year started off with a major M&A deal in TMT, followed by **Unity's** announced M&A deal in Augmented Reality, although the latter deal has been subsequently canceled. **Citrix Systems** completed a Buyout/LBO deal in Cybersecurity in September and **Change Healthcare** completed a major M&A deal in HealthTech in October. However, the winter and spring have resulted in smaller deals, although Intel completed a significant IoT Debt Financing deal in February of 2023, while Stripe completed a Later Stage VC deal in FinTech that was quite significant in March 2023.

The most significant Climate Tech deals were from companies offering electric batteries (**Northvolt**), construction solutions (**H2 Green Steel**), and energy solutions (**Archaea Energy** and **X Energy**). Of these, the work of H2 Green Steel in the construction technology space has the power to transform the PropTech industry, and the company may shift its dynamic in the future, to becoming more of a PropTech "Building" category company, although that shift has yet to occur. Similarly, although Northvolt presently works purely on electric vehicle batteries, the impact of technology could transform many elements of the PropTech ecosystem in the near future. Additionally, although PropTech cannot match the titanic impact of FinTech, the present ecosystem places PropTech in strong competition with AI and HealthTech, with PropTech more closely matching the impact of ClimateTech and HealthTech long-term.

Chapter 6: **Future Projections**

Overview

This chapter engages in a discussion of future projections for the PropTech market. Of particular interest will be our modeling which demonstrates that the average success rate of a PropTech company reaches fruition at the seven to 15 year mark. Further, we show substantial data to suggest that of a selected sample set of top companies by opportunity score and exit type, that most successful companies are predicted to be acquired. Indeed, even among the cream of the crop, the number of companies that are predicted to have no exit exceeds the number that are predicted to go IPO. That said, we are excited that are modeling was able to select a few companies to watch in terms of their potential to go IPO.

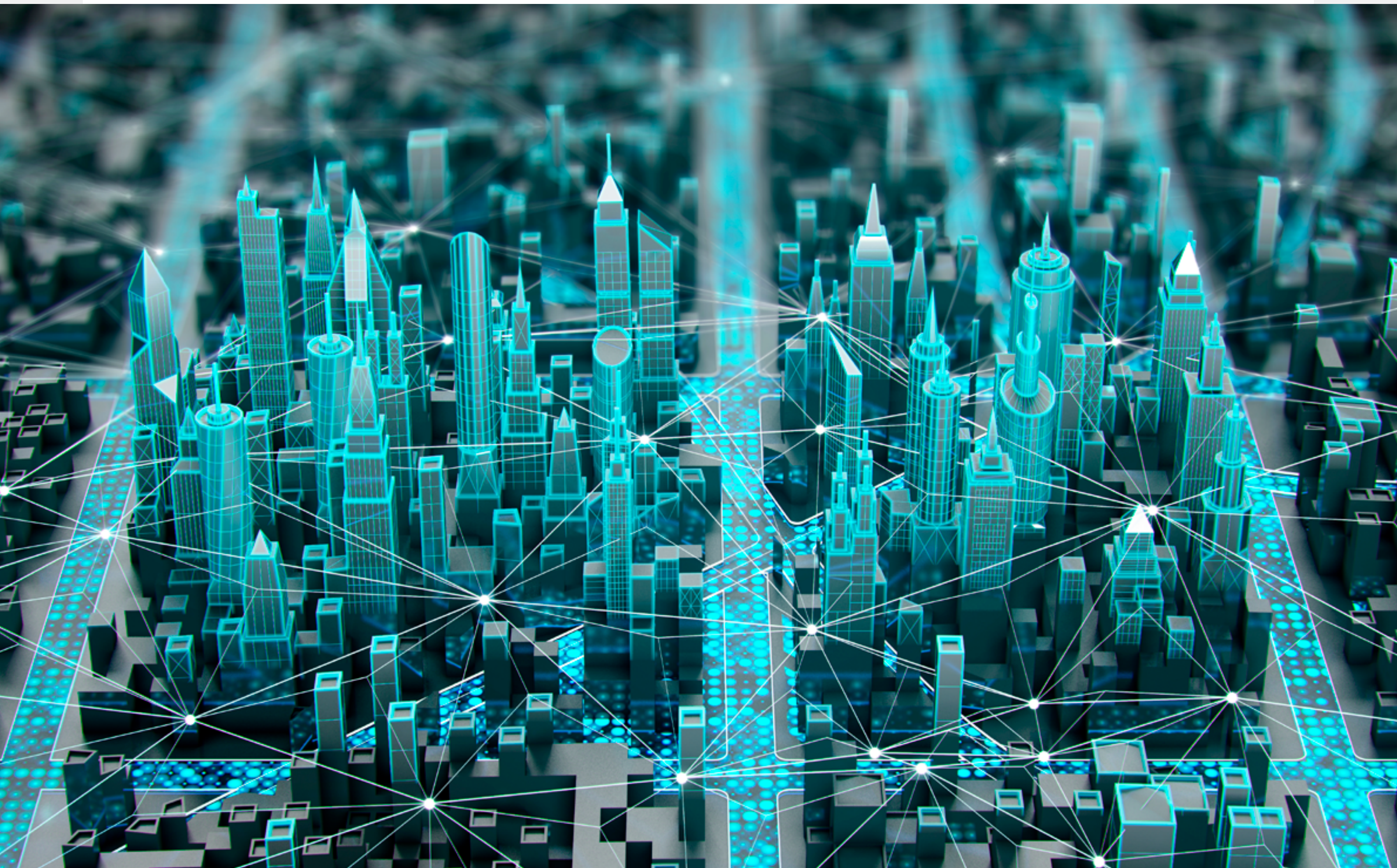
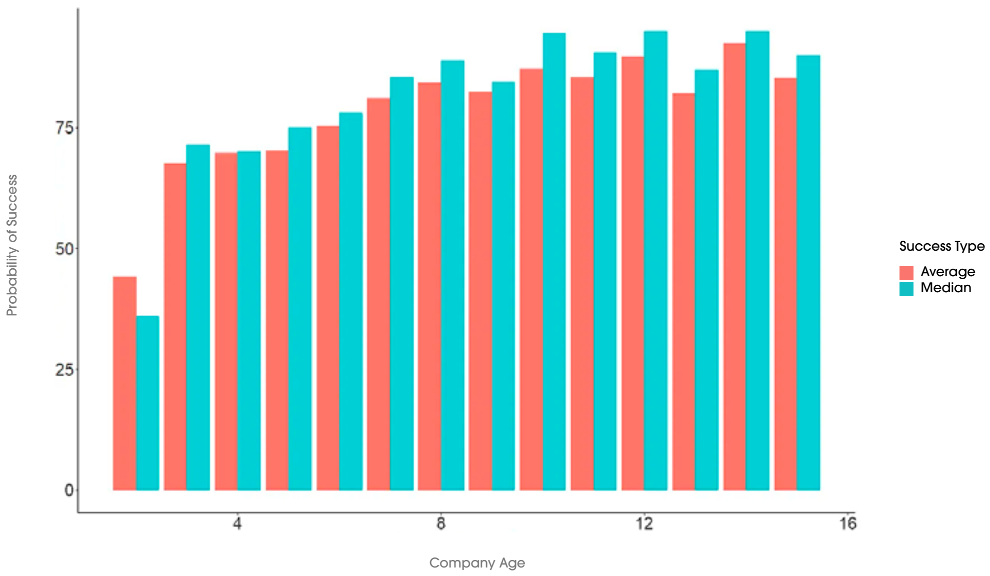


Figure 36: Probability of Success by Company Age



Given a sample set of six hundred PropTech companies that completed deals for more than a millions USD in the 2022 to 2023 fiscal year, Figure 36 shows the probability that those companies will be successful by their age. Here, "success" is measured by either an IPO or an M&A deal, whereas "failure" would be defined as a situation where there is No Exit. Most importantly, the entire ecosystem relies on an understanding that most companies in the startup world, something near 75%, do not have an exit, or fail to produce one in the lifetime of the company. Thus, it is not a surprise that younger companies will not show evidence of a strong probability of an exit. As a sign of this, for companies that will be two years of age by 2024, assuming a set of companies that are at least one year of age presently, shows that an average of less than half of these (44.14%) will have an exit, while the median presents an even more bleak future for these young companies, with just a 36% median success rate. However, when a company reaches three years, the picture becomes more optimistic, with an average of 67.67% of companies predicting success. That said, **the median and average rates of success do not climb above 75% until a company is five to six years of age**. What this evidence suggests is that new companies should have a "survival plan" which will allow them to continue to raise funding and inject capital into growth until they reach at least five to six years of age. At that stage, the probability of their success becomes much higher, consistently averaging over 80% once a company is seven years of age or older, while the median rate of success for such companies remains consistently above 84%.

Figure 37: Top Companies by Opportunity Score & Exit Type

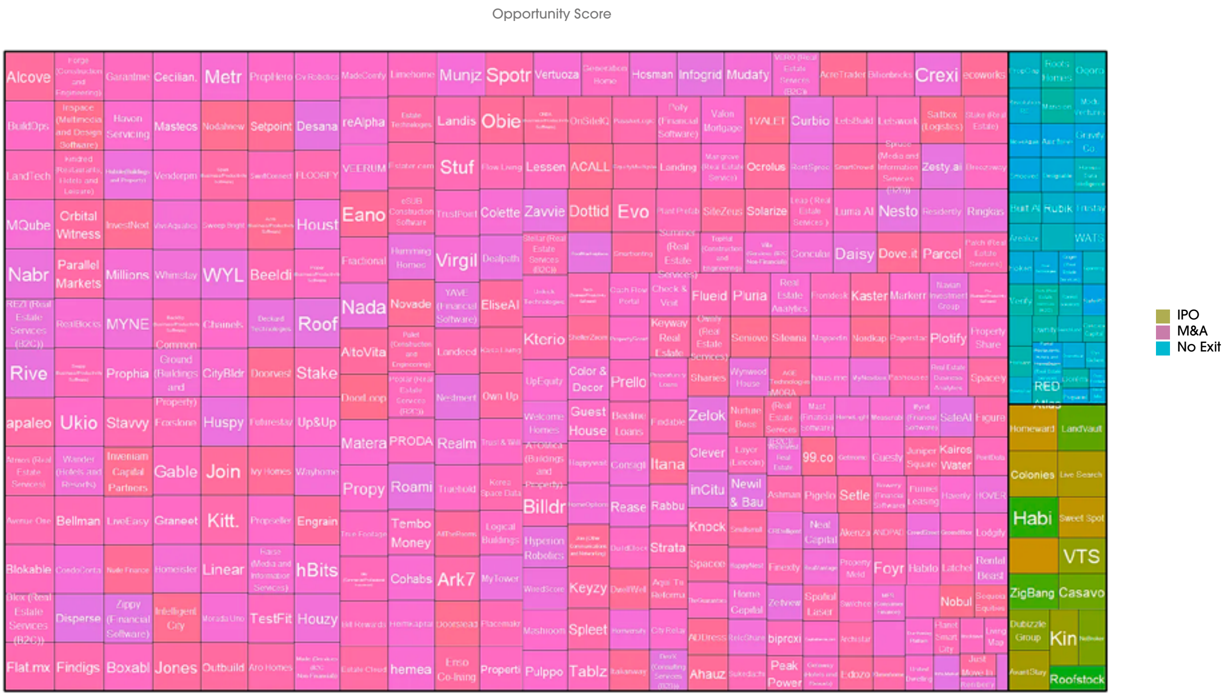
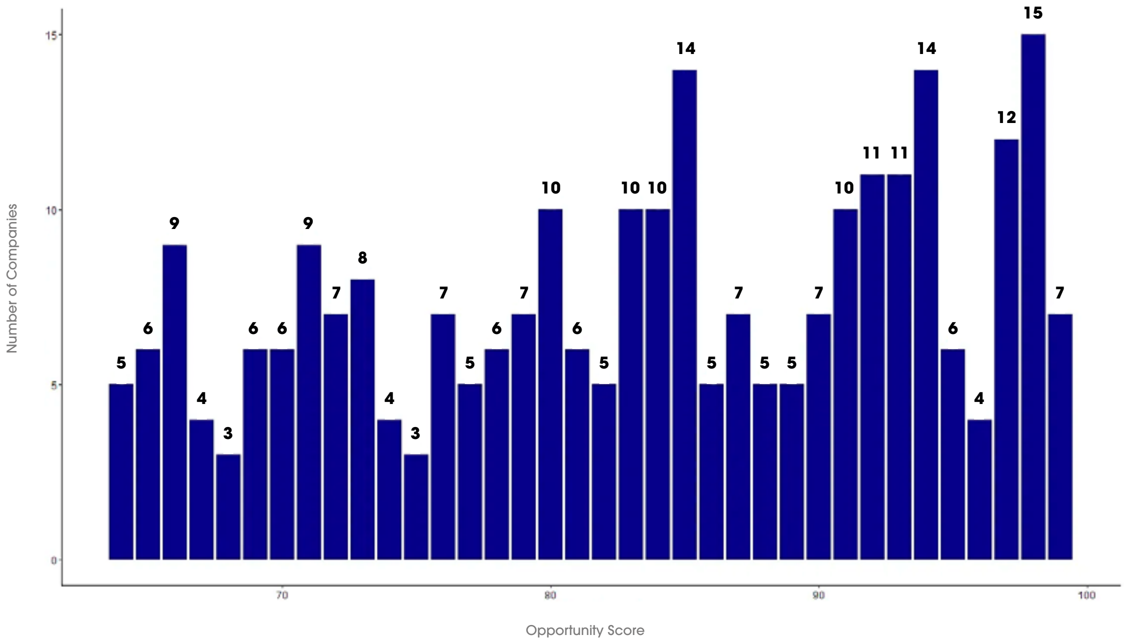


Figure 37 shows the opportunity score and predicted exit type for our sample set of six hundred companies that raised more than $1 million USD in financing during the past fiscal cycle. The vast majority of these companies are predicted to have their exits be some form of Merger and Acquisition. Indeed, **our modeling predicts 57.17% of these companies will either merge or be acquired in the future**. By contrast, only 25 companies have either been financed through an IPO already or are predicted to achieve IPO status in the near future, while 41 companies are predicted to fail and have "No Exit." That **only 4% of companies are predicted to reach IPO status**, while nearly twice as many (or 6.8%, to be precise) are predicted to fail is assuredly daunting. However, our predictive modeling has one weakness: there were no ascertainable predictions for nearly a third of companies (191, or 31.83%) simply because of missing data in the modeling information. Nevertheless, the picture of the present market is clear, for the vast majority of PropTech startups, the dream is more likely to be an M&A deal than an IPO. At the same time, when we aggregate the companies by opportunity score, there tend to be more companies aggregated toward the top end of the opportunity score distribution.

57.17%

of these companies will merge or be acquired in the future, according to our models

Figure 38: Number of Companies by Top Opportunity Score



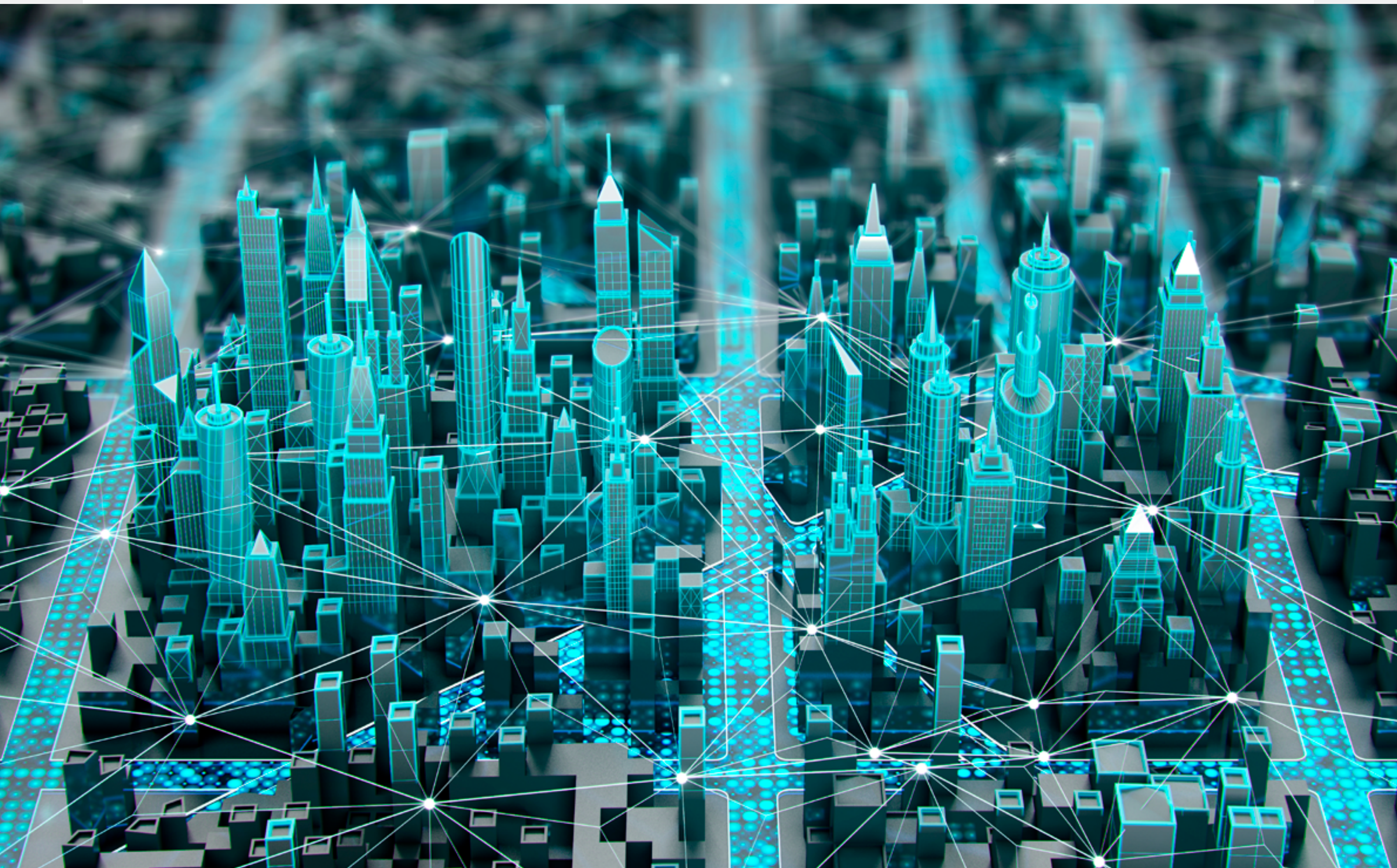
Given the incredible challenges today's market can present, it is somewhat surprising to see that there are more PropTech companies at the upper end of the distribution spectrum of Opportunity Score than at the lower end of the distribution spectrum. This occurs when we rank PropTech companies by their predictive opportunity score, a measure of the return on investment (ROI) that VCs might expect, while also taking into account the likelihood of an exit, additional funding and other factors, such as patents and technological innovation, where PropTech companies might have some competitive advantage when compared to the broader market.. However, it is worth noting that those companies in the top decile of opportunity score are much more likely (as much as three times) to secure an exit deal. Additionally, there are scant representations of potential IPOs among these top ranked companies.

One example of a company with a high opportunity score (94) and a high probability of success (98%) that is predicted to go IPO is **Homeward**. The next highest ranking potential IPO is **Landvault** (92 Opportunity Score, 97% success prediction). However, the VC opportunity score indicating the best return on investment may not correspond directly to the most stable investments in terms of companies that have a solid shot of going to market with an IPO. For instance, the top four companies in terms of their ranking of likelihood securing an IPO are VTS (92%), ZigBang (88%) and Casavo (83%), which is tied with Dubizzle Group (83%). However, the opportunity scores for these companies indicate that they might not result in the highest margins for VCs (being 71, 70, 68, and 68, respectively). At the same time, all rank at a 98% chance of success, and thus would make for more stable investments than a higher risk, higher return investment. Similarly, there are just four companies that stand to make great returns for VCs (with an opportunity score of 98, each), with a high likelihood of success (98%, each), and a high likelihood of an M&A deal (97%). They are: **RealBlocks**, **Parallel Markets**, **Inspace**, and **Blockable**.

Each of the above companies would make a great target for an M&A deal for a variety of reasons. Blockable is a company that emphasizes the construction of low-cost and connected communities. It is a new and relatively small company based in California, with just 23 employees. But more importantly, the company has already made it to the "seven-year mark," which, as previously indicated, dramatically increases the likelihood of success for a venture-backed company. Finally, the investor track record, news article mentions, average deal size, number of investors and fundraising timing all strongly contribute to the predictors of success, with the most significant factor being fundraising timing (contributing 15 of 98%). By contrast with Blockable, Parallel Markets targets serving almost the opposite clientele, as it works to tokenize real estate investments, along with companies, funds, sports teams, and art. Yet, it is also quite small, with just 32 employees, based in NYC, and already five years old. Again, it is the fundraising timing (18% of 98%) that contributes the most to the predictors of success, although these are followed by the number of investors, investor track record, and the number of employees.

Both **Inspace** and **RealBlocks** are slightly larger companies, with 42 and 48 employees respectively. However, they are each quite small in the grand scheme of things. As both are founded in 2017, they are reaching the prime age for a Merger & Acquisition deal on the horizons. While RealBlocks focuses on the financial services end of transactions, providing a platform designed to connect advisors and investors to alternative investment managers. Inspace, by contrast, is the designer of a building imaging platform, allowing for the creation of HiFi VR experiences through manipulating sun settings by time and date, see new perspectives in sectioning and control visual settings in renders. However, while RealBlocks' fundraising timing is contributing 12% to their predicted success, the same indicator for Inspace is contributing 18%. Yet, both rank in the 99th percentile in their industry subsectors of financial software and multimedia design, respectively.

The overall portrayal of the PropTech market for the coming cycle is one of both promise and uncertainty. While it is indeed possible that some companies will see astronomical growth rates, well exceeding the predicted ten-year industry average of 9.3% (2023-2023), it still seems relatively safe to predict that PropTech leaders will continue to "beat the market" during a time when growth is so moderate that it is predicted to be just slightly higher than current forecasts for inflation in the United States in 2024. At the same time, it is the particular technological innovations of PropTech that will help us all in the challenges of tomorrow.



Case studies

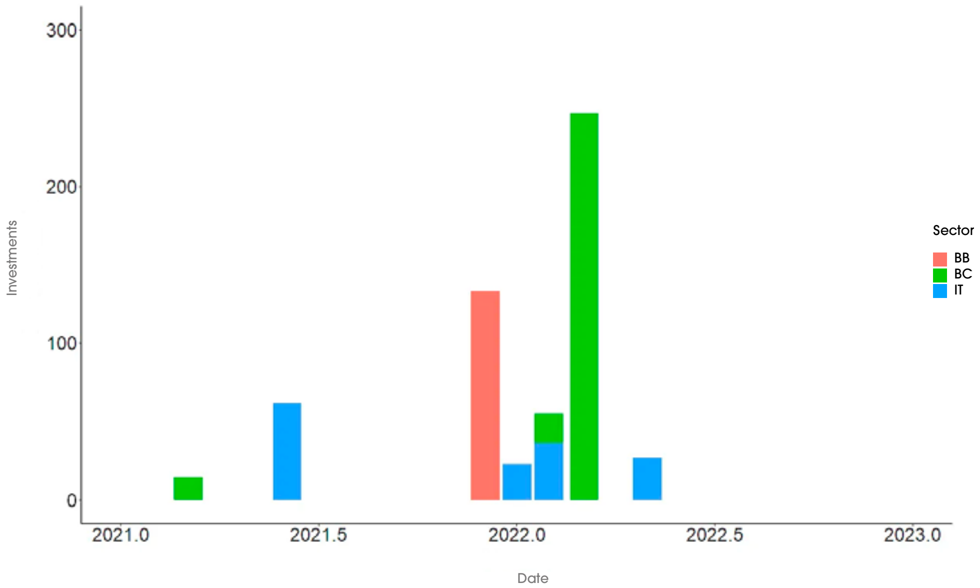
Case Study 1:
SVB, Credit Suisse, First Republic Impact Study

In March 2023, the first in a series of four significant bank failures posed challenges to the underlying fabric of the economies of the North Atlantic. **Silicon Valley Bank** failed on March 10 and Signature Bank failed on March 12. With Silicon Valley Bank being based in Santa Clara, California, and Signature Bank being based in New York, two centers of the PropTech industry, PropTech companies were poised to absorb the impacts by the Ides of March. **First Republic Bank**, based in San Francisco, was also in trouble, requiring an injection of funds from other banks as of March 16 and by March 19, following rapid emergency negotiations with the Swiss government, UBS announced its planned acquisition of **Credit Suisse** for a deeply discounted $3.25 billion to prevent the bank collapse. While First Republic's cash injection propped it up for a time, the organization was floundering and folded to a cash sale to Goldman in an acquisition by May 1. However, Silicon Valley, Signature, and First Republic banks were all in clear trouble before their failures, as was Credit Suisse. While there have been many hypotheses about the impacts of these bank failures on the PropTech industry, our case study will be among the first data-driven analyses specifically focused on the impacts on PropTech. Here we engage in what is called a "difference in differences" analysis. We will be reviewing the relationship between these banks and PropTech and how that relationship might have been transformed after the collapse of these banks.

$3.25

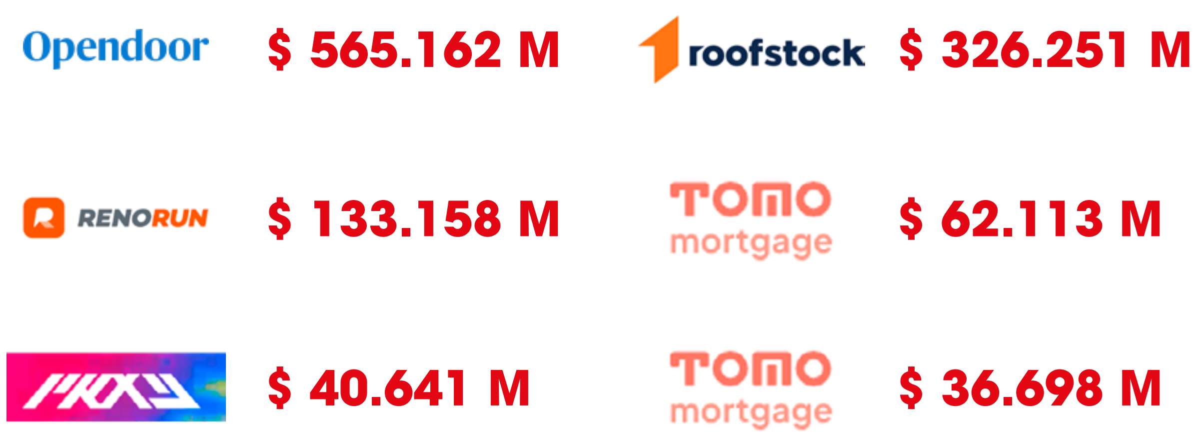
BILLION
to prevent
the bank collapse

Figure 39: SVBs Quarter by Quarter Proptech Investments by Category



The above image shows SVBs Quarter by Quarter PropTech investments, broken down by category, from 2018 through 2023. Their investments were relatively diversified, although they were most solidly invested in the Managing category. The image below, however, zooms in on these deals and assesses them by Industry Vertical in the months leading up to the failure. We see very large investment in the B2C vertical, as well as the Living category, with smaller investments in IT companies. Overall, these investments appear to be relatively diversified across categories of PropTech companies and Industry Verticals as well.

Figure 40: SVBs Most Significant PropTech Deals



Homebound	**$ 33.600 M**	Azibo	**$ 32.941 M**
UPFLEX	**$ 26.920 M**	withme	**$ 26.472 M**
NOMAD	**$ 18.399 M**	RENORUN	**$ 16.707 M**
maxsold	**$ 15.127 M**	cherre	**$ 14.729 M**
Darwin	**$ 14.729 M**	nomis	**$ 14.865 M**
匠人科技 ARTISAN TECHNOLOGY	**$ 1.466 M**		**$ 1.356 M**

The image above shows SVBs most significant PropTech deals, especially with **Opendoor** – one of the most transformational digital platforms for real estate in the United States and a company in the Managing category – and **Roofstock** – another online property marketplace, albeit one designed to help people buy and sell tenant-occupied properties – a company in the Investing category. Since these two companies represent leaders in the PropTech industry, it followed that there were some fears that there might be instability ahead. The circumstances were made worse by a series of events that unfolded in the coming days.

Of all of the significant bank failures in the Spring of 2023, Signature Bank was perhaps the least intertwined with the PropTech industry. First, Signature Bank was relatively young, having only been founded in 2001 when former employees and executives of Republic National Bank of New York jumped ship with their wealthy clientele after a purchase agreement with HSBC. The bank focused on New

Opendoor

$565.162

MILLION

roofstock

$326.251

MILLION

York clients, expanding only gradually beyond NYC, although it was one of the first banks to opt into the cryptocurrency market in 2018, with 30% of their deposits being cryptocurrency by 2021. After SVB had failed, Signature Bank customers withdrew $10 Billion USD in deposits. The bank failed, and at the time of its failure, 89.3% of deposits were uninsured. Loans and branches were acquired by Flagstar Bank and the venture banking portfolio was acquired by Customers Bancorp. Previously Signature Bank had drawn the ire of critics as they had underwritten **$16 Billion USD in multifamily lending**, the largest in the sector in NYC besides New York Community Bank. Ironically, however, given their reliance on cryptocurrency deposits, the bank did not invest heavily in the PropTech sector.

Of the three banks involved in the Signature Bank deal, being Signature Bank, Flagstar Bank, and Customers Bancorp, Signature Bank is the only significant potential PropTech investor, through their Mortgage Tech Accelerator Program, in Brace, a developer of a loan servicing platform designed to manage the loss mitigation lifecycle, in 2019, while Flagstar had also acquired Stearns Holdings, a provider of a residential mortgage delegated correspondent lending platform, in 2017. Although Signature Bank was not involved in PropTech in any structurally significant fashion, Flagstar looks to be. As of March 2023, they announced they were accepting applications for the fourth MortgageTech Accelerator program, which focuses on incubating startups operating at the intersections of financial and real estate technology.

It can be said that the acquisition deal of Credit Suisse, had little direct impact on the PropTech market, despite the fears of the potential of the bank for an outright failure and the impact on the market more broadly. Credit Suisse was only an active investor in just three individual PropTech companies: Wingtra, Equippo, and Workstation. Of these, Credit Suisse Entrepreneur Capital, under Dider Denat, had wisely invested in Wingtra's new technology in 2019 in a round of Series A funding. In a further demonstration of the companies resilience, they completed a fifth round of fundraising on March 20th of 2023, raising some **$22.6 Million USD**, nearly double the fundraising of the round Credit Suisse Entrepreneur Capital had been invested in. Credit Suisse had also been an investor in an early round of fundraising for Equippo in 2018. Finally, Credit Suisse Innoventure Capital had been a significant investor in the early days of the company Workstation, although that company went bankrupt and was liquidated in 2005. Needless to say, Credit Suisse was not a major investor in the PropTech sector. Nevertheless, the organization has completed some very significant deals in the broader intersections of the Real Estate market and the Technology market.

Case Study 2:
Mortgage Tech

As an important subfield in PropTech, **Mortgage Technology** companies make use of artificial intelligence (AI), other forms of machine learning, and blockchain technologies, among others, to revolutionize the process of lending. Mortgage Tech includes companies that cover all stages of the life of a loan for a property, beginning with origination and processing, as well as continuing through appraisal and payments. Key trends to follow in the field of Mortgage Tech include digital lending, underwriting, mobile apps for loan processing, fraud prevention technologies, improvements in the customer experience, reductions in operational cost, greater precision in documentation and approval processes, risk assessment tools informed by big data and data analytics, and online mortgage brokers and lenders. Nearly 50% of borrowers already prefer self-service online portals, while 90% of surveyed individuals from buyers and lenders say digital mortgage technology is a must, and 70% argue the use of Mortgage Tech helps reduce the time needed to close a loan. Further, **the projected value of the digital lending markets was between $11.33 and $12.6 Billion USD as of the end of 2022**, but is expected to grow tremendously over the next decade. Some projections show digital lending reaching a relatively conservative $30.77 Billion USD by 2030, although other projections show the global digital lending market could grow as high as $71.8 Billion USD by 2032.

ICE Mortgage Technology™

Figure 41: Mortgage Tech Investors

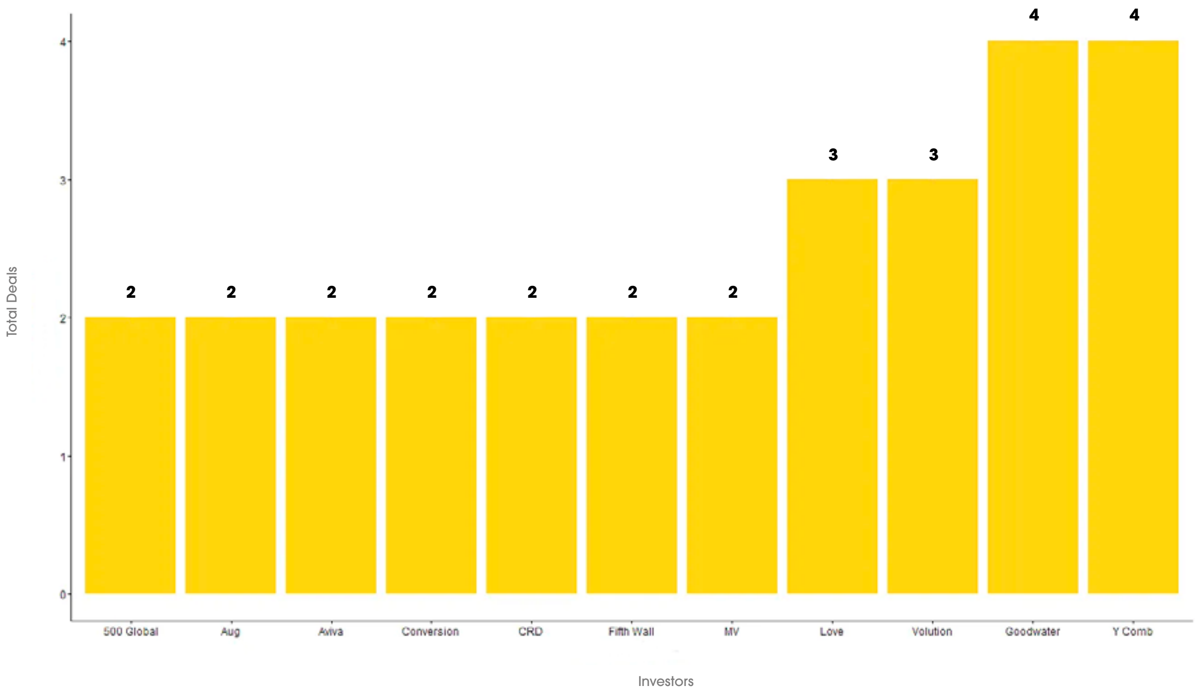


Figure 41 shows the most active investors in the field of Mortgage Tech in the past fiscal year. We can see that top tech investor venture firms hold the most active spots, with Goodwater Capital and Y Combinator each participating in four (4) deals, while the number three and four spots are taken by Love Ventures and Volution Ventures, each completing three deals. Two of these new ventures include Kashin (Consumer Finance) and **Holocasa**, each sponsored by Y Combinator. Holocasa is the developer of an end-to-end mortgage platform that allows real estate agents to prequalify and instantly rank their leads. Their platform also allows the prequalification process itself to be streamlined for consumers, by centralizing inquiries from up to ten financial institutions at once. In this way, Holocasa is working to streamline the loan application process, while Kashin is more directly providing a source of cash flow. **Kashin**, after all, is a developer of a microlending application designed to service small loans to underbanked communities, by utilizing a combination of social credit scores and other measures of security to provide access to capital from their headquarters in Lima, Peru. Since 1.4 billion adults in the world remain underbanked, including more than half of Peruvians, Kashin's model could be a solution that spreads rapidly in developing markets.

However, the number of investors that are quite active, completing two deals in the past year, indicates how Mortgage Tech differs from other subfields of the PropTech industry. Augmentum Fintech, Aviva Ventures and Conversion Capital are all companies that have a preference for FinTech investments. The activity of these investors is an illustration of one of the key directions of Mortgage Tech: direct collaboration with FinTech companies. Fifth Wall by contrast, is the most active and largest PropTech venture capital firm and thus their participation flags Mortgage Tech as an important part of the broader PropTech landscape.

To give an example of a company that has been working in the Mortgage Technology space, we might consider Noah, which is listed as a "FinTech" company on Crunchbase, but is clearly an innovator in the PropTech industry more specifically. Noah innovates by providing debt-free home equity financing with no monthly payments added to existing mortgages and no additional interest. Instead, what they receive in return is a share in the portion of the future depreciation or appreciation of a property value.

Watch the interview

"The core thesis we had at Noah was: US homeowners are asset rich and cash poor. There is approximately 16 trillion dollars of home equity wealth that is illiquid in the US...that is not tradable. At the same time, the credit card debt has topped a trillion dollars. So, we theorized you should be able to take a portion of that housing stock to pay down your debt and not have to make a 24% APR monthly payment. But the traditional banking sector has not served a big chunk of consumers well. So, the idea behind Noah was to say, 'How can we take something that's illiquid, that's not tradable, that's difficult to fractionalize; how can we use financial innovation, technology and data to make it more accessible?"

Sahil Gupta
Founder, Noah
A company enabling homeowners to tap the value of their homes without incurring new payments or interest

Noah and other mortgage technology innovators have been fundamentally disrupting both the investing and the lending aspects of the housing market as a whole, through technologies that enable co-financing, co-investing, co-owning, and co-living. That said, the data reveals two giants have emerged in recent years in this space.

Figure 42: Mortgage Tech Key Fundraisers

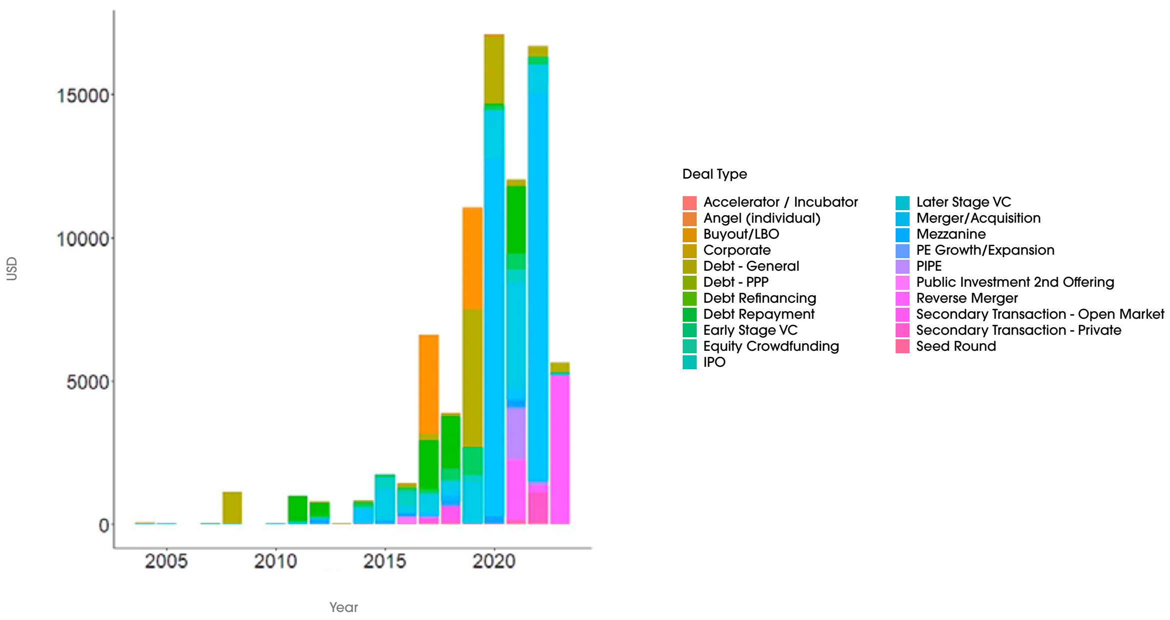


Figure 42 illustrates the deals participated in by key Mortgage Tech fundraisers by deal size, date, and deal type. We can clearly see, based on this data, that Mergers and Acquisitions (M&A) deals grew significantly from 2020 onward. Further, through an analysis of this data, we quickly found **ICE Mortgage Technology** and **Black Knight** were the two most significant players in terms of recently completed Mortgage Tech deals, both with very significant deals falling into the Mergers & Acquisitions (M&A) classification of deals. However, the two companies have very different strengths.

Black Knight has focused primarily on data and analytics solutions - albeit solutions delivered through proprietary software - for consumer loans, real estate loans, and capital markets. Their strength has truly been automated valuation models, data integration, and risk assessment, which then drove their software solutions, although their software has driven most of their revenue. Black Knight was acquired by Fidelity National Financial for an undisclosed amount in 2014, before raising **$441 Million USD** in their initial public offering (IPO) in 2015. However, former shareholders became minority shareholders (45.72%), with New BKH common stockholders (from Fidelity National Financial Group common stock) controlling 54.28% of the shares as of a 2017 M&A deal, although the company also completed several secondary transition and debt refinancing deals from the same era, through 2021. Finally, in 2022, ICE Mortgage Tech and Black Knight announced an M&A deal for ICE's acquisition of the latter.

$441

MILLION

ICE Mortgage Technology, like Black Knight, has been a developer of software products and services focusing on the processing of mortgage applications. The company began in 1997 as Ellie Mae, Inc. and was acquired by Intercontinental Exchange in 2020 for 11.4 Billion USD, becoming renamed ICE Mortgage Technology. Although ICE is most famous for its past acquisition of the New York Stock Exchange, which represents 55% of their revenue, they have used a series of acquisitions to generate substantial mortgage technology business (18% of revenue) and fixed income and data services segments representing a remainder of their revenue (27%). Their most recent major financing includes Morgan Stanley acquiring a 23.5% stake in 2021. However, ICE's moves in the Mortgage Tech space have not gone without their criticism and scrutiny. After they acquired the MERS mortgage data repository in 2016 and the 2020 deal with the company formerly known as Ellie Mae (now ICE Mortgage Technology), ICE then announced a subsequent acquisition of Black Knight in 2022. The deal attracted the attention of the American Federal Trade Commission (FTC), citing concerns over ICE proprietary control over software that is expected to become the backbone of Mortgage Tech in coming years. However, the FTC withdrew their inquiries as of August 8, 2023. The opportunity for transformation here is enormous, given that under 10% of mortgages in the United States go through the process of digital notes. Hence, similar technologies adopted in the markets of Europe, Latin America, Africa and Asia could also prove equally revolutionary.

Case Study 3:
Construction Tech

Construction Technology refers to the collection of materials and resources, machinery, software, and data analysis companies contributing toward revolutionizing the way that we build. BIM, drones, modular construction, digital twins, virtual and augmented reality, 4D simulations, and 3D printing are all well-known examples of Construction Technology. Relating Construction Technology to our main four categories results in most companies being placed in the Building category. However, we find many companies in Construction Technology are engaged with elements of the process, either through Financial Services or by providing IT support, that mean that they are not strictly related to the Building process alone. In part, this is due to the flexibility of technologies and their uses. For instance, if we take the company Matterport, we find a company that got its start engaging primarily with supporting the sale of real estate, through providing photos, videos, and 3D visits of sites. Gradually, the company grew to the point that their technology can be used to facilitate the sale of factories half a world a way.

Watch the interview

"Each of these transformations (from analog photography to digital imaging) creates a richer understanding of the property that a person is experiencing online. Properties sell faster and at a higher price if they have a Matterport digital twin. Two independent studies have verified that...but we've also seen surprising usages of digital twins in the rental and sale luxury yachts, to document progress in construction... (and)...we also see use cases in terms of insuring properties against and adjusting for damage caused by extreme weather events...ultimately having a digital twin is useful for the entire life cycle of a property from the moment it becomes a built reality."

JD Fay
CFO, Matterport
A company integrating camera technology with a capture app to seamlessly capture every detail of a physical space

Digital twins, thus have become a staple of Construction Technology as a field and many companies offer them as part of the process of constructing and completing renovations on existing properties. However, once digital twins were becoming more commonplace and companies like Matterport had proven their worth, other segments of the PropTech industry, particularly in the built world of Construction Technology began to take note. Rene Markos, of Alice Technologies illuminates the situation.

Watch the interview

"For us, the problem of digitization is that the input to construction is design and it was not possible to digitize Architectural Design until the past five years or so. When you look at simulation...simulation has failed for two main reasons. First, it's too complicated. There's construction in different cities. There's different regulations, different weather; it's too complex. The second reason simulation has failed is because you need a list of tasks, say thousands of tasks, each with uncountable rules attached to them, and then you'd have to explain this all to a computer. It's not scalable. The solution isn't to model every construction nuance. The solution is to convert all of that messy data into generalized scheduling constraints. That was the breakthrough."

René Markos
Founder, Alice Technologies
A construction optioneering platform empowering the world's leading contractors to plan, bid, win, and build.

The stories of Matterport and Alice Technologies are certainly remarkable. Both companies have fundamentally transformed the future of the real estate industry. At first, Matterport made headway by digitizing records of existing buildings, paving the way, in a sense, for Alice Technologies to build upon their shoulders, and delve in the realm of simulation. Through simulating construction, companies can now lessen their carbon footprint, create more sustainable, safer, and longer lasting structures, speed up the pace of construction and reduce rework.

Overall, Construction Technology is the field that deals most directly with physical assets, while also interacting most intimately with the web of regulations that can ensnare any project. Furthermore, although we will deal with Climate Tech distinctly in Case Study 4, it is important to note that Construction Technology is on the forefront of addressing the many problems associated with the realities of Climate change. From the use of more sustainable construction materials, including the safe reuse and repurposing of formerly toxic materials, through energy saving technologies like smart glass, the Construction Technology subfield of PropTech is working to address these pressing problems as well.

Figure 43: Construction Tech Investors

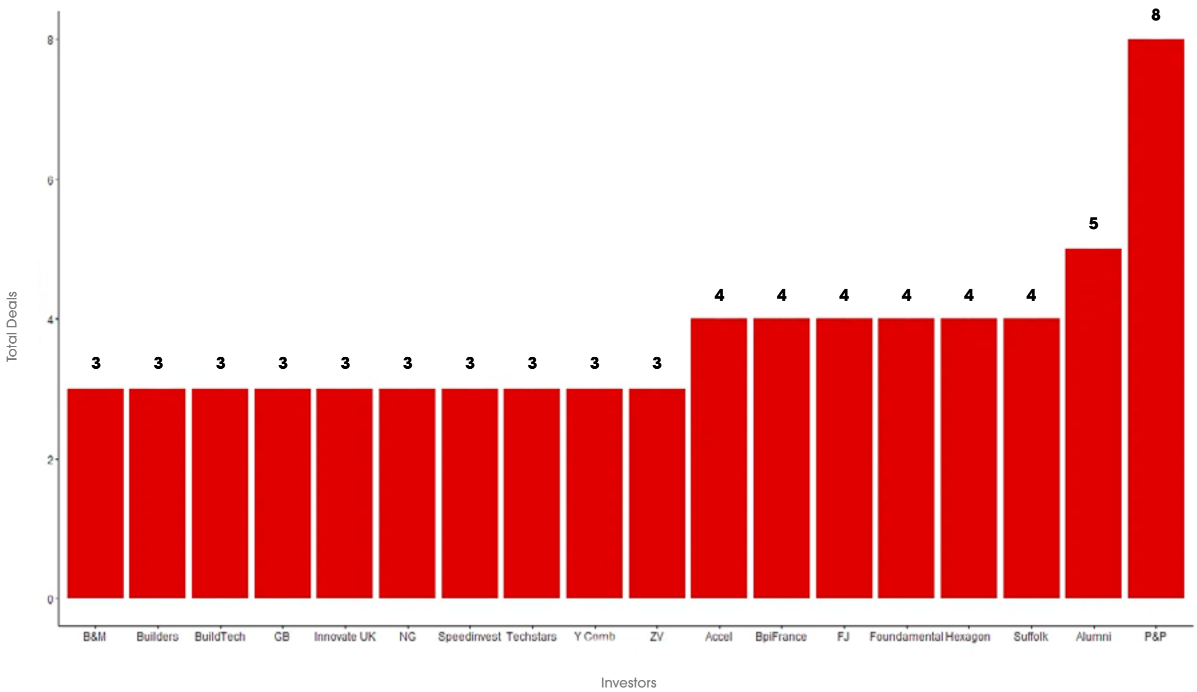


Figure 43 shows the most active investors in the Construction Technology field in the past year. Notably, we see that investors are more active in the Construction Technology space at present when compared to the Mortgage Technology space. This difference may reflect the greater opportunities for technological innovation present in the

Construction Technology field. Most active investors are, naturally, large venture capital firms just as Alumni Ventures (Manchester, NH) and Accel (Palo Alto, CA). However, they also feature the major accelerator/incubator companies, such as Plug and Play Technologies and Techstars. Furthermore, they also include sovereign wealth funds like Bpifrance and government investors like Innovate UK. Of these investments, 61.03% are based in the United States, while 8.59% are located in the U.K. and just 8.14% are located in the People's Republic of China (PRC). Relative to overall investments in PropTech, this means that a lower proportion of Construction Technology investments are in the PRC in the past year, which runs counter to expectations. Additionally, while 154 French investors made up a substantial proportion of the market, in that they account for 5.69% of the capital raised, significant overall players in PropTech, such as German and Spanish investors, haven't been as active in Construction Technology, suggesting there is space for growth in those markets in such countries.

Figure 44: Construction Tech Deals by Size, Type, and Year

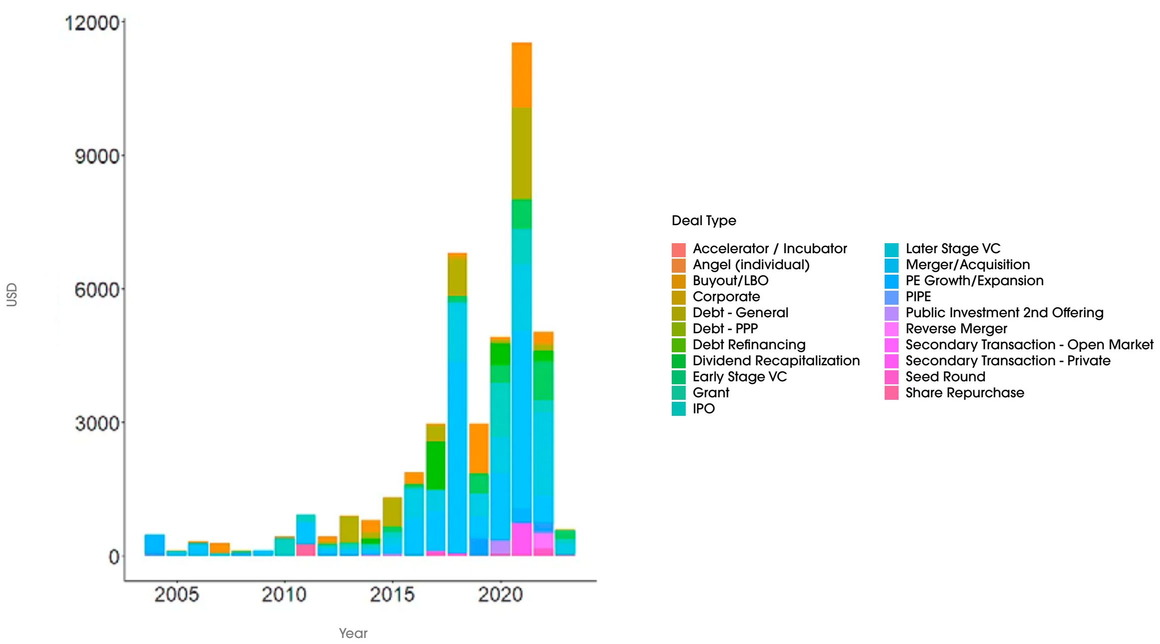
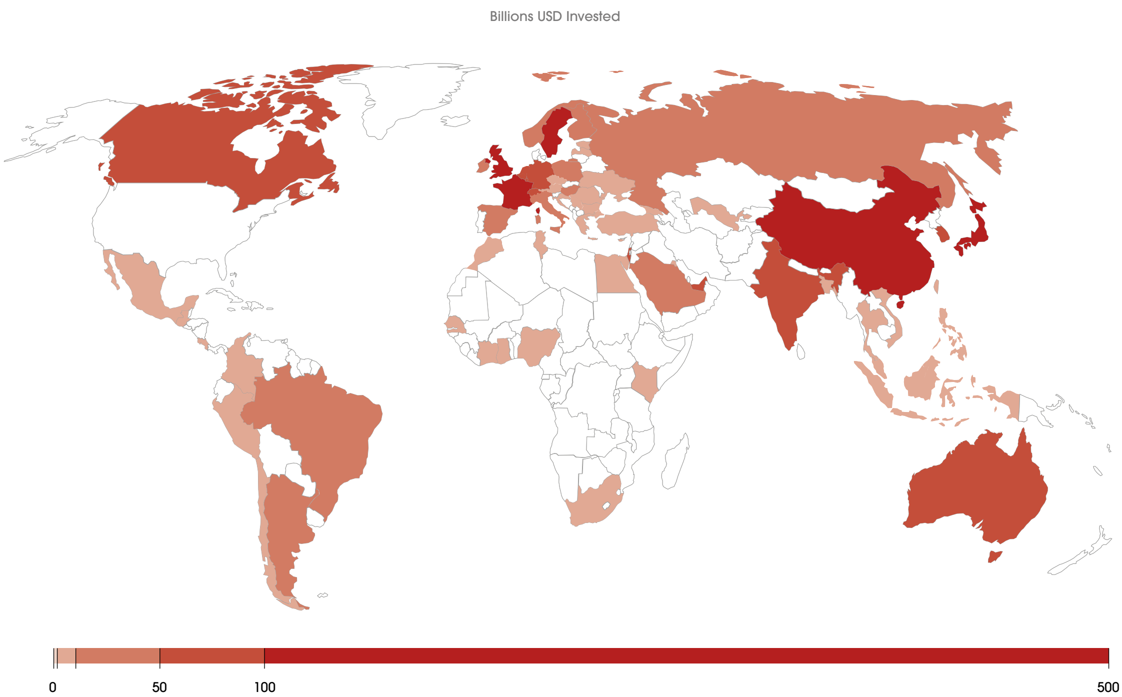


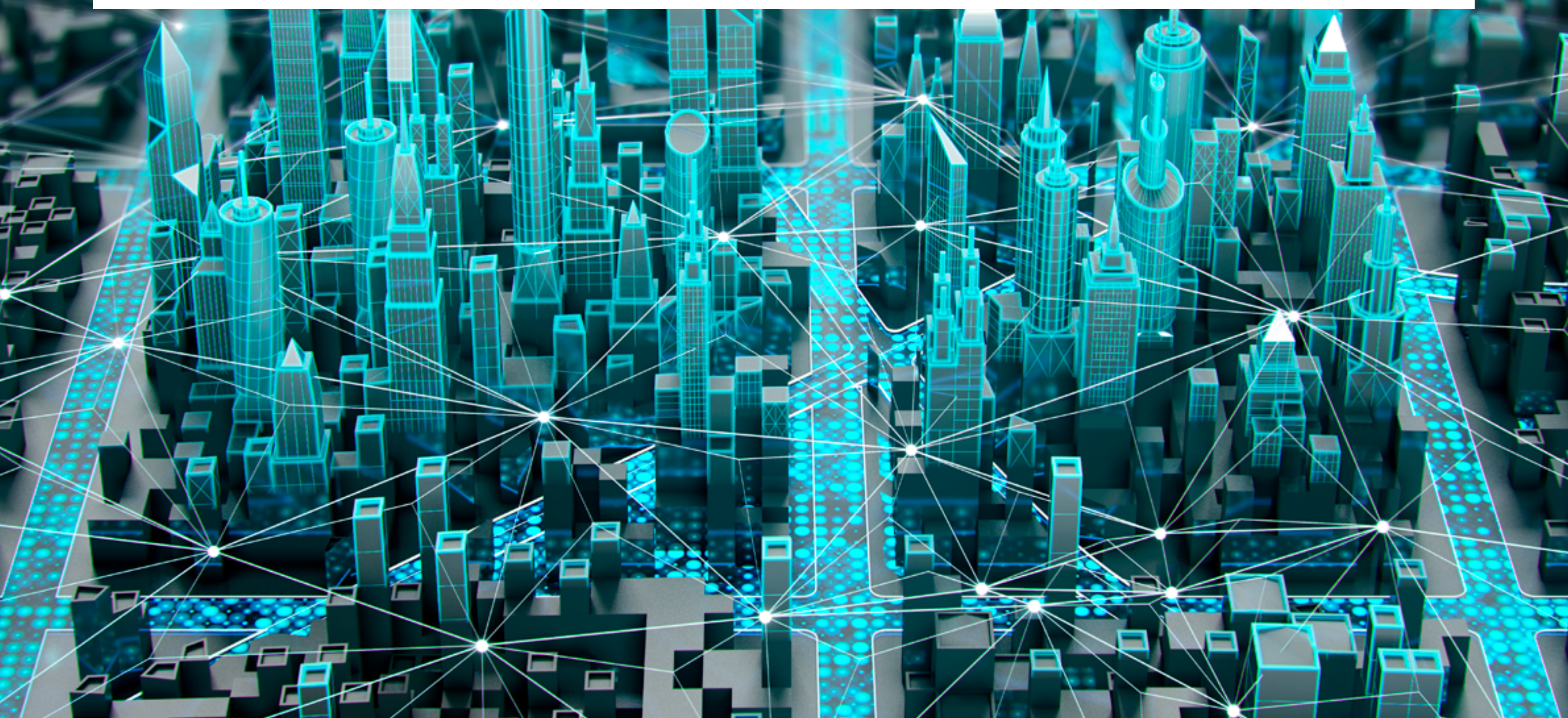
Figure 44 is an illustration of the key deals by size, type, and year in the Construction Technology space. We can note that while there is substantial growth of Mergers & Acquisitions in the 2021 calendar year, following a similar pattern in the Mortgage Technology space, the sudden spike in M&A does not appear to be as anomalous in the Construction Technology space. For instance, a quite substantial number of large M&A deals were completed in 2018, well before "Pandemic Economics" was a significant disruptive force in its own right. Further, when we break these deals down by country, as illustrated in Figure 46 (below) we see some interesting points that emerge.

Figure 45: Construction Tech Deals by Country (All Time, Excluding the USA)



To begin with, our data shows that the really quite significant markets of the United Kingdom and France, when it comes to Construction Technology, are quite nearly matched by China and Japan. Germany, India, Australia, and Canada make up a second tier of major players. In a third, we have Spain, Poland, Saudi Arabia, Brazil, and Argentina. This is all to say that the east-west distribution and the north-south distribution of Construction Technology deals, once we exclude the USA from the dataset, is more balanced than other sectors of PropTech, including Mortgage Tech, where investments are more concentrated in the global west and north. Perhaps this is because ConTech represents one of the elements of the PropTech sector that is dealing most directly with the physical built reality of our everyday lives. Thus, the path toward integrating Construction Technology into developing markets may be more direct. Additionally, we have to consider that countries like China and Japan may provide additional governmental incentives for the technological development of infrastructure, which can be found in Europe, but are relatively lacking in the United States and Canada. Government incentives behind the development of public-private partnerships, indeed, help to explain the strength of both the Chinese and Japanese markets in this case.

Looking back at the history of Construction Technology deals, it is true that our data shows the early years of Construction Technology did not create many very large fundraisers. Nevertheless, a few notable players quickly emerged in the 2010s. For instance, **Autodesk** - a company focusing on providing software solutions for product design and manufacturing - completed very large general debt deals in 2013 and 2015, before completing significant debt refinancing deals in 2017 and 2020, and another general debt deal in 2021. The first really significant Construction Technology M&A deal was completed when **Textura** - a provider of on-demand business collaboration software - was acquired by **Oracle** for $698.3 million USD in 2016. There were then a series of significant M&A deals in 2018, including Aconex, Accordion, PlanGrid, and Gordian. This was the same year as Katerra's crushing VC round. The deal sizes continued to crest through 2021, when **Quanta Services** announced the acquisition of **Blattner Energy** for a cool $3.015 Billion USD. The deal was also significant for Climate Tech, as Blattner Energy is a provider of EPC contractor services for green energy - especially wind and solar - including front end engineering, procurement, project management, and construction. In the most recent fiscal cycle, although the deals have been significantly smaller, they are still quite notable. For instance, Trimble's acquisition of B2w Software was announced in September at a cool $322.1 million USD, which will allow the former to provide unprecedented end to end digital twins for heavy civil and infrastructure contracting.



Case Study 4:
Climate Tech

Climate Technology - or Climate Tech - companies are among the most pathbreaking companies in the marketplace today. Climate Tech companies are defined as those with significant programs or products that are explicitly focused on reducing Green House Gas (GHG) emissions. Since Real Estate accounts for nearly 40% of GHG emissions, with 28% of global emissions coming from maintenance and operation and another 11% coming from construction and materials, investing at the intersections between Climate Tech and PropTech is vital for the future of the planet. Naturally, while B2B and B2C companies still form a substantial portion of the marketplace for Climate Tech, Energy, Materials and Resources, and Healthcare play significant roles, as does Information Technology. As of the end of the 2022-2023 fiscal year, nearly five thousand companies (4,998) had participated in more than twenty thousand deals (20,527) with the aid of more than fifteen thousand investors (5,229) to raise a total of $611.45 Billion USD.

We need to underscore that some companies in this dataset may not be first in the mind when discussed with the general public. Certainly, well-known innovators, such as **Tesla** and **Northvolt** are well represented in the historical data, but then again, so are international aerospace and defense firm juggernauts, like **Boeing** and **Lockheed Martin**. Indeed, Boeing might be an example of a company that a popular pundit might point to as a leading contributor toward climate change. At the same time, given that Boeing has invested more than $60 Billion USD in innovation and key technologies over the past decade, while reducing emissions by 15-25% with each new generation of airplanes - now 90% recyclable by weight for reuse of parts and scrap - it's not entirely surprising to see the company as a major player in the Climate Tech space. Indeed, they have invested in more than 230 environmentally smarter technologies through the ecoDemonstrator program.

TESLA

northvolt

BOEING

LOCKHEED MARTIN

Figure 46: Climate Tech Key Fundraisers by Industry Vertical

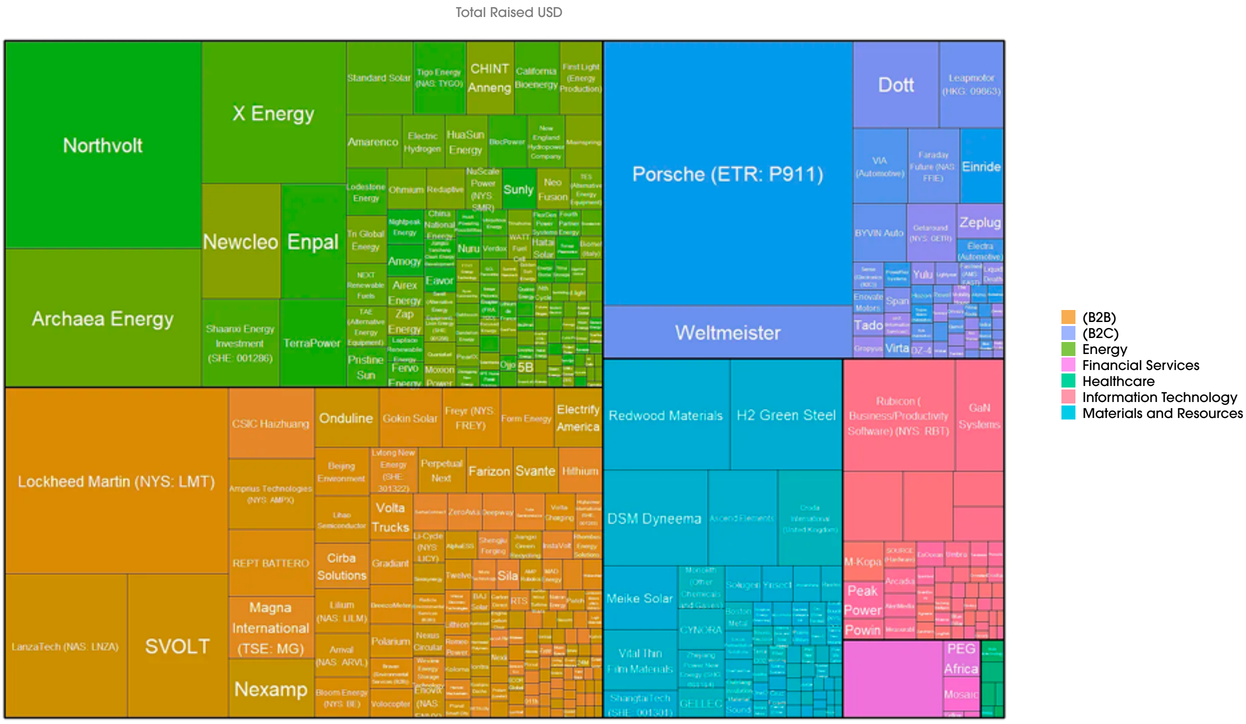


Figure 46 shows the Top 500 Climate Tech deals in the past two decades, in all industries and all industry verticals. Most of these deals were completed between 2015 and 2023. When we consider the most recent and significant deals in the Climate Tech space in the past year, a few leaders emerge at the top of the list. To begin with, breaking news as of the writing of this year's Barometer, **Northvolt received $1.2 Billion USD in debt financing from Volkswagen, Swedbank, Morgan Stanley, J.P. Morgan, Goldman Sachs, and other major lenders in August 2023**. Almost a year ago, another truly significant deal resulted in **Rubicon** Technologies' acquisition of Founder SPAC for $1.7 Billion USD through a reverse merger, bringing the combined energy to the market through the NYSE (RBT), as of August 15, 2022. Rubicon is a software platform that provides full-service waste management and recycling solutions to smart cities. Naturally, although their work is most often described as ClimateTech or CleanTech, as well as SaaS and Mobility Tech, Rubicon's solutions for smart cities have a direct impact on real estate spaces, whether they be commercial or residential.

northvolt

$1.2

BILLION
in debt financing

Another top leader in the recent Climate Tech fundraising space has been **Lanza Tech**, a nature-based carbon refining company that works to transform carbon waste into building blocks for consumer goods. These goods might be fuels, fabrics, or packaging. Their most recent financing resulted in $500 million of development capital through a private placement PIPE deal in February 2023. Additionally, as announced in March 2022, Lanza Tech was acquired by AMCI Corp II through a $2.23 Billion USD reverse merger, resulting in the combined entity trading on NASDAQ (LNZA). Notably, in both the cases of Rubicon and Lanza Tech, we observe the companies being brought to the public exchanges through SPAC/reverse merger deals, which is a phenomenon we highlighted in last year's barometer as an increasingly popular strategy in the PropTech ecosystem.

LanzaTech

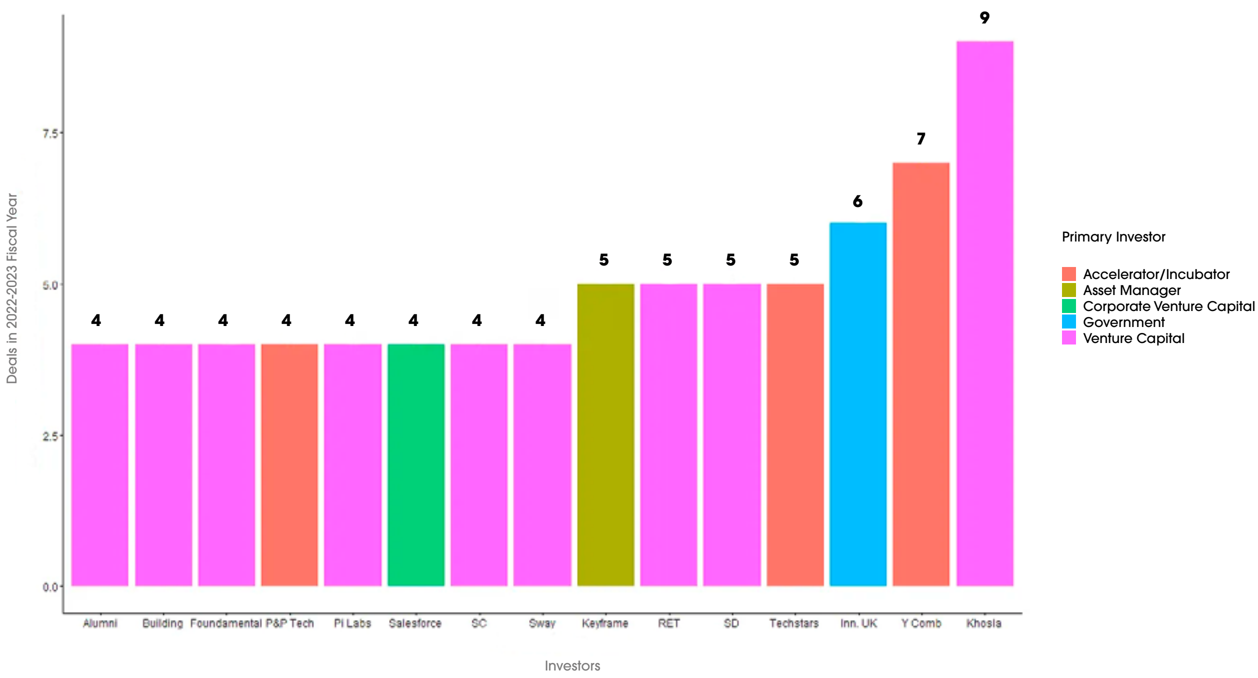
A good example of a top leader in the Climate Technology space that is still receiving rounds of VC funding is **Redwood Materials**, a developer of sustainable battery recycling technology, concentrating on production and reprocessing of batteries from consumer products (such as laptops, power tools, e-bicycles, and more). Because of the nature of their products, Redwood Materials is naturally intertwined with the developments of Real Estate technology, especially in terms of thinking about how commercial real estate is undergoing a transformation as the climate of the office space is revolutionized. Power tools are used in construction, e-bikes for transportation, and while desktops were the staple of the office space in the past, laptops have become the contemporary standard office supply. Redwood Materials completed a Later Stage VC deal in July 2022, followed by a significant $2 Billions USD in general debt financing in February 2023.

REDWOOD MATERIALS

Finally, while **H2 Green Steel** is a younger company than Redwood Materials, having received their first round of financing in just 2021, they remain equally as promising. The company operates a steel production plant that is intended to develop and deliver fossil-free steel in Sweden. Unquestionably, the possibility of a green steel solution would fundamentally revolutionize construction, in Europe, but also across the world. As of October 2022, the company had raised 260 Million Euro in Series B venture funding and is last reported to have been in talks for a round of Series C venture funding as of April 2023.

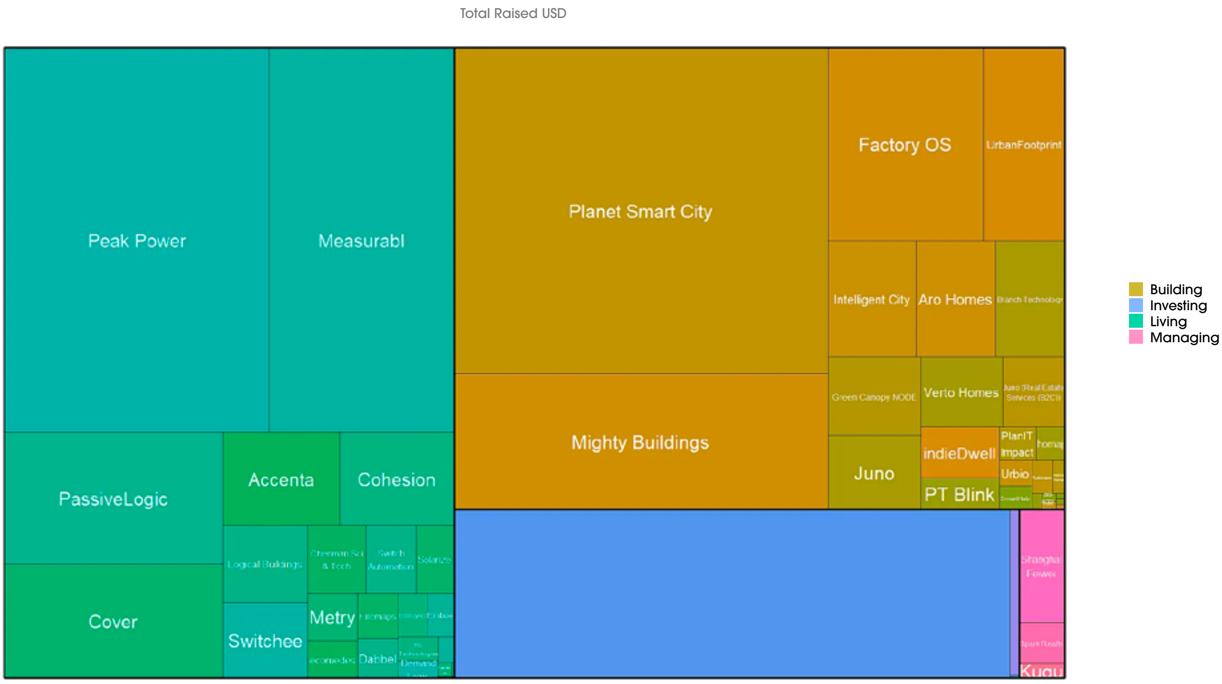
H2 green steel

Figure 47: Real Estate x Climate Tech Investors



Although, as highlighted above, a significant number of the companies operating explicitly in the ClimateTech space naturally overlap with the concerns and interests of PropTech, the number of companies that truly intersect with both fields in their day to day operations is a significantly smaller, albeit rapidly growing, community. Some 439 investors have been involved in 244 deals, helping to raise over $200 Million USD for 61 companies operating at the intersection of these two fields. Between 2014 and 2022 calendar years, the only year where the number of deals decreased was during the 2016 calendar year, when just eight (8) deals were completed. However, the number of deals had doubled by 2019 and tripled by 2022, totaling 27 deals in the 2022 calendar year. The most active investors in the 2022-2023 fiscal year were Energy Impact Partners, Moderne Ventures, and Suffolk Technologies. Energy Impact Partners is a Private Equity firm based in Boston, MA aiming to invest in the decarbonization of the global economy. By contrast, although they are venture capital firms more concentrated on investments in the PropTech community, Moderne Ventures and Suffolk Technologies have emphasized commitments to emerging technologies as their most exciting investments. The behavior of such investments begs the question: How are PropTech companies helping to transform the ClimateTech space?

Figure 48: Real Estate x Climate Tech Key Fundraisers by Category, 2013-2023



The above image shows the key PropTech companies that are innovating in the Climate Tech space, aggregated from data collected over the past decade. Much more of this segment of the PropTech market is in the Building and Living categories, two categories that we previously highlighted may have substantial potential for growth in the near future. Between 2012 and 2023, the top five PropTech fundraisers working in the ClimateTech community are Planet Smart City, Peak Power, Wunder Capital, Measurabl, and Mighty Buildings.

Planet Smart City raised \$70 million USD of series C funding, aiming to close the round as of April 2023. The company is a designer of real estate housing developments emphasizing the build of smart neighborhoods, including architectural, digital, environmental, and social innovations. They aim to help businesses develop entire neighborhoods that foster a sense of community, with a mind toward sustainability. Relatedly, **Mighty Buildings** is a developer of 3D printing technology and automation platforms aiming to make the construction of housing more sustainable and affordable. Mighty Buildings raised \$50 million in Series B1 venture funding in January of 2022 and is currently ranked as a prime company for a targeted merger or acquisition, as they remain quite small to be considered a good investment for an IPO. Nevertheless, their innovative use of 3D printing technology is certainly of note.

White Planet Smart City and Mighty Buildings are focused on the provider end of the real estate market, Peak Power, Measurabl and Wonder Capital are focused on key elements of the maintenance and management life cycle of properties. To begin with, **Peak Power** is a developer of AI-power energy optimization software. The likelihood that this company moves to market through an IPO is considered more likely than, say, Mighty Buildings, which is surprising, since they are also a rather small company. However, perhaps some perceived longevity of the organization is buttressed by the several rounds of grant funding (2017, twice, 2019, 2020, and 2022, twice) and venture funding, which they have successfully raised. Most recently, the company raised $35 million of venture capital in a Later Stage VC round, completed in May 2023. Meanwhile, **Wunder Capital**, an operator of solar investment funds connecting investors with solar projects raised an impressive $47.57 million in capital as of May 2022. However, Wonder Capital is another company where the likelihood of an exit as of this writing trends toward the probability of an M&A deal, rather than an IPO.

A final top PropTech fundraiser in the Climate Tech space is Measurabl. Like Peak Power and Wonder Capital, **Measurabl** should be considered as concentrated on the maintenance and management life cycle of real estate. They are, after all, the developer of a data management platform intended to provide informed analysis of the sustainability performance of real estate spaces. Most recently, they received $93 million USD through a combination of Series D and Series D-1 funding in a deal led by Energy Impact Partners and Sway Ventures, with the former being one of the lead active investors in the past year, as we previously mentioned. While there are clearly challenges for companies operating at the intersection of PropTech and Climate Tech, not the least of which is the nature of Climate Change itself, these companies also present tremendous opportunities to leverage new technologies and transform the global PropTech industry for the better.

Chapter 7: **Focus on Monaco:** PropTech solutions to improve sustainable performance

Foreword

In today's dynamic real estate landscape, the fusion of real estate technologies (PropTech) and environmental, social and governance (ESG) principles has become a key driver of sustainable development. It's a subject close to the heart of the Principality of Monaco, which has made it one of its main areas of development. Monaco's innovation-driven ecosystem encourages the research and development of solutions and technologies to meet the ambitions of an environmentally-friendly real estate sector.

In this chapter, we look at how Monegasque startups are working on the transformative potential of using PropTech to improve sustainability performance. From energy-efficient management systems to carbon impact management solutions, intelligent data and storage space optimization, the integration of PropTech tools offers real estate professionals a powerful arsenal for aligning their operations with sustainability goals. This symbiotic relationship not only fosters environmental responsibility but propels the real estate industry towards a future where innovation and sustainability go hand in hand, paving the way for a more resilient and responsible built environment.

Diego Bonaventura
Head of Digital Economy,
Government of Monaco

Case Study:

YouStock - Digital Basement: the innovative pro-carbon solution.

YouStock has started as a door-to-door storage service to get rid of any stress when an individual or a company needs to make space. That service contributes in improving the ecological impact that lack of space has on transportation and cities: by mutualizing transport and avoiding half empty storage space. It also has a social impact: moving and lack of space are among the highest causes of stress for citizens. Plus, we are levelling up a long time undervalued "porter" job.

YouStock has also realized that the lack of space is affecting building construction and management. Appartements are smaller than ever, building underground is costly economically and terrible ecologically (high carbon footprint and soil impermeability). Therefore a YouStock Digital Basement is an innovative and pro carbon solution that provides a strong argument for Real Estate Developers to definitely stop building customer unfriendly basements when being asked for it by City Councils. The carbon footprint of an operation can be improved by up to 7% (analysis done by Socotec).

Watch the interview

YouStock Digital Basement is an innovative and pro carbon solution that provides a strong argument for Real Estate Developers to definitely stop building customer unfriendly basements.

Pierre Charvet
CEO & Co-Founder

Case Study:
UBY - Optimized, secure, and serene constructions

UBY
SUSTAIN YOUR CONSTRUCTIONS

Environmental and structural monitoring is emerging as one of the key challenges in the PropTech field. Due to the increasing complexity of issues related to new material of sophisticated structures as well as sustainability and environmental impact, real estate companies are faced with the need to implement high-tech monitoring systems. These technologies not only make it possible to meet current challenges linked to asset's health, noise management or air quality, but also to anticipate and adapt to future developments in environmental and technical standards.

The recent development of new technologies and Data allow us to provide simple and unique intelligent solutions meeting the environmental, health, safety, productivity and sustainability challenges of the construction sector and infrastructure operators. UBY creates innovative services for worksites and infrastructure by harnessing the power of digital, technology and data. UBY stands out in a fast-growing market with solutions integrating powerful data analysis algorithms, advanced digital platforms, and patented sensors.

From 2019, the Principality of Monaco chose to integrate the technologies developed by UBY for monitoring the project "Îlot Pasteur". Monaco is a territory with a high urban density and monitoring noise and traffic congestion linked to construction sites are priorities for the Public Works Department. To meet these requirements for measuring and identifying the noise sources, UBY equipped the site with sensors incorporating a patented noise source recognition algorithm as well as a 360° acoustic camera. To monitor traffic jams around the site, UBY supplemented the monitoring system with cameras alerting the Public Works Department when traffic jams form on priority roads.

Watch the interview

> **These emerging technologies not only make it possible to meet current challenges linked to asset's health, noise management or air quality, but also to anticipate and adapt to future developments in environmental and technical standards.**

Etienne BLOCH
Commercial Director - Monaco

Connected to the UBY Environment SaaS platform, the sensors make it possible to precisely identify the origin of the noise source, locate it in an area of the construction site and visualize it on camera image. Traffic jams alerts with images are sent directly to the platform and allow rapid intervention when construction site operations impact traffic in the Principality.

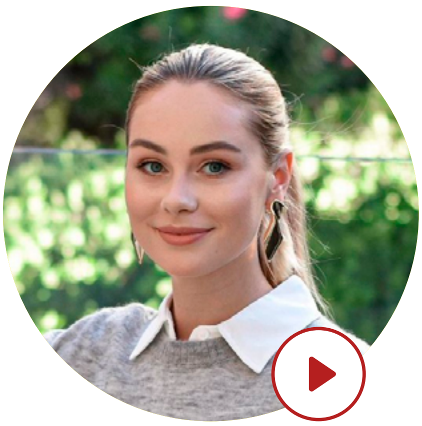
The technologies embedded by the sensors and the UBY platform allow efficient and automated control of the project "Îlot Pasteur", thus improving its acceptance by local residents.

Case Study:
NET0 - Pioneering the Future of Corporate Sustainability with AI-Driven Carbon Intelligence

The PropTech industry is grappling with a significant challenge: buildings are responsible for approximately 42% of global carbon emissions. This encompasses all phases from construction and retrofitting to operation. The complexity of these processes poses a considerable hurdle for companies aiming to reduce their carbon footprint in a cost-effective manner. Despite the urgency to act on climate change, the economic viability of implementing sustainable practices remains a daunting obstacle for many organizations.

Net0's solution empowers businesses to navigate the complexities of carbon emissions management with a singular, powerful AI-driven approach:

Net0's AI technology excels in capturing and organizing emissions data from diverse, unstructured sources across the entire lifecycle of buildings. This methodical collection and analysis allow for granular, precise emissions measurement, enabling businesses to identify specific areas for improvement accurately. Leveraging this detailed insight, the platform not only measures but also guides strategic decarbonization efforts, recommending operational enhancements and connecting companies with eco-friendly vendors. The integration of comprehensive data aggregation with actionable intelligence facilitates a seamless transition towards sustainable practices, supported by economic incentives that make green initiatives a financially viable choice for the partners.



Watch the interview

“When we look at the real estate industry today, we are facing a substantial challenge, building contribute up to 42% of global carbon emission. Despite this challenge, it’s encouraging to see Governments, including Monaco’s actively promoting initiatives making a positive impact on our climate.”

Sofia FOMINOVA
Co-founder NET0

Net0 is an AI-driven carbon management platform, uniquely designed to assist businesses in effectively measuring and reducing their carbon footprint. The software specializes in providing a powerful ecosystem of solutions for tracking and managing carbon emissions, leveraging advanced AI to automate and streamline this complex process. Additionally, Net0 focuses on empowering businesses to make informed decisions that lead to meaningful reductions in carbon emissions, aligning with global sustainability goals.

Renowned for its precision and efficiency, Net0 is a preferred choice for several Fortune 500 companies and governments around the world. Through Net0, organizations can meet regulatory and environmental standards while enhancing their economic performance, showcasing the synergy between ecological responsibility and financial success.

Watch the interview

> **At NET0 we laverage AI to automate the major menter of carbon emission related to construction and operation of buldings, more than that, our technology identify opportunities for emission reduction, suggesting process improvements.**

Dmitry AKSENOV
Co-founder NET0

Case Study:

OGHJI - Achieving sustainable energy savings through smart electricity consumption

We can find an electrical switchboard in each single building in the world.
It is strategically located at the heart of the building's electricity consumption and yet its potential is limited by a 50 years old technology of mechanical circuits breakers.

Oghji is a new generation of electrical switchboard which natively integrates - at each circuit level :

- Safety against short circuits and electrocutions
- Accurate real time monitoring
- Alerts in case of electrical incident or unsual consumption
- Consumption analysis
- Programming based on presence in the building, time of the day, electricity fee period for effortless energy savings
- Automatic temporary load shedding of low priority circuits to avoid bypassing subscribed power

And all this is controlled through a touch screen which replaces the traditional circuit breakers, or remotly via an app.
Knowing that consumption monitoring alone allows reaching up to 15% savings, we aim for oghji to go even further than that.
We will roll-out a first batch of the oghji boards by the end of 2024 and we would like to experiment them in an eco-district of the Principality, in collaboration with the SMEG (Monégasque Electricity and Gaz company) and the MTE (the Government team in charge of the Energy Transition program).
Thanks to its connectivity, oghji will allow to report on the electricity consumption globally and by main usages for informed decision making.

Watch the interview

> **Knowing that consumption monitoring alone allows reaching up to 15% savings, we aim for oghji to go even further than that. We would like to experiment them in an eco-district of the Principality.**

Pierre Fourlinnie
Founder & President OGHI

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About Extended Monaco

The Extended Monaco program is unparalleled globally. It marks the first instance of a government harnessing the full potential of digital technology across all public policies and economic sectors simultaneously. Launched by HSH Prince Albert II in April 2019, it is spearheaded by Frédéric Genta, Secretary of Monaco for Attractiveness and Digital Transformation.
Designed to benefit both Monégasques and residents alike, whether for business or tourism purposes, the program focuses on various domains such as smart city initiatives, administration, healthcare, education, and infrastructure. Its core priorities include enhancing the already exceptional quality of life, ushering in a new era of economic prosperity, and elevating the efficiency of public services.

For further details, please visit our website at extendedmonaco.com.
https://eme.gouv.mc/barometre/proptech-global-trends-2023/