Venture Capital in Physics Deep Tech
Technical Annex

Overview

This document is intended as a supplementary companion guide to the data analysis performed by the IOP for the *Venture Capital in Physics Deep Tech* report, explaining in more detail the various methodologies and data procedures.
A series of standalone IPython notebooks have also been created that allow for the large parts of analysis to be reproduced - available on request from the IOP at physicsinsights@iop.org.

Definitions

Throughout the analysis and this document, various definitions, terminologies and synonyms are used.

- **Fundraising amount**: The *Amount raised (converted to GBP)* field available in the Beauhurst fundraising data.
- **Physics Deep Tech (PDT)**: A grouping term that combines all of the physics-based industries, as identified by the IOP.
- **Physics-intensive**: A synonym for the Physics Only category, comprising of companies only operating in physics industries (as opposed to those operating in both physics and non-physics industries). These companies may also be grouped into a PDT-Only category.
- **Non-physics-intensive**: A synonym for the Other Sciences category, comprising of companies only operating in non-physics industries.

1. Data

The data analysis outlined in this document leveraged company and fundraising data downloaded under license from the **Beauhurst** platform.[1]

- UK company data were downloaded on 25/04/2024
- UK-backed fundraising data were downloaded on 02/05/2024
- Supplementary, other fundraising data were downloaded on 02/07/2024

The Beauhurst platform provides a list of Buzzwords, Industries, and Sectors (referred to collectively as *industries* hereafter) for each company, corresponding to their technological and economic activity.[2] These industries formed the basis for the science (and physics) company selection process for this analysis.

1.1. Science Industries

Beauhurst industries were compared across a range of signals to identify those that lean heavily on scientific research and innovation. These metrics were assessed for the set of *Tracked* and *Ceased tracking* companies within each industry. The signals used were:

- proportion of companies with a Beauhurst *Innovation* signal;[3]
- and proportion of companies with an Innovate UK grant.

industries were classified as science-based if they met one of two criteria:[4]

1. proportion of companies with a Beauhurst *Innovation* signal >= 40% AND proportion of companies with an Innovate UK grant >= 25%;
2. proportion of companies with a Beauhurst *Innovation* Signal >= 30% AND proportion of companies with an Innovate UK grant >= 30%.

This resulted in a list of 86 science-based industries. (A full breakdown is provided in *Table 1: List of Science-Based Industries & Groupings*.)

1.2. Physics Industries

The 86 science-based industries were further classified with a binary physics indicator by examining a range of more specific physics signals.

Firstly, industries were identified where businesses have a high physics score, on aggregate, in IOP modelling.

That modelling does this:

[1] platform.beauhurst.com
[2] https://help.beauhurst.com/en/articles/9189555-descriptions-and-classifiers
[3] R&D grant, Academic spinout, Patent (https://help.beauhurst.com/en/articles/9189499-what-are-signals)
[4] The output of this classification was overridden to include *Oil and gas*, *Nuclear energy*, *Military and defence*, and *Space travel operators* in addition to excluding *Other hardware* from the science-based definition.

- Takes United Kingdom Research and Innovation (UKRI- including Innovate UK) grants and assigns them to a certain number of well-fitting research topics, using machine learning on grant text, with more of the value of the projects allocated to the best-fitting topics (sometimes topics are already allocated by researchers working on the projects, which allows the model to be trained).
- Calculates the average physics score (a figure between 0 and 1, representing closeness to physics) of those research topics (as chosen by scientists on IOP committees)
- Finds the weighted (on grant value) average of the physics scores of the grants linked to a company.

In this project, IOP looked at a given Beauhurst industry and identified the businesses where a physics score had been allocated. The process was to take the aggregate weighted physics score for those businesses and arrive at an industry physics score.

Those above the 75% percentile were treated as having a high physics score and marked physics = True by default.

Since the physics score contains some uncertainty (often when the industry is quite small, or only a relatively small sample of the businesses receive innovation grants), a framework of five additional tests was established to reclassify if there was reason to doubt the initial allocation.

The purpose of the tests was to check for industries which were closely linked to physics-based research topics (as used by UKRI) or existing Physics Based Industries (as used in the IOP's Physics & The Economy report) or had a clear reliance on research and innovation in physics-based technologies.

The signals used were:

- has a high IOP Physics Score- from the modelling described above.
- has been featured in previous IOP work;
- has an associated IOP Special Interest Group;
- has another compelling link to physics;
- associated UKRI research topic is physics;
- or has an associated Physics & The Economy industry.[5]

Industries were classified as being in the physics group if they met at least 1 of these criteria, with some manual adjustments made.[6]

This resulted in a list of 48 physics-intensive and 38 non-physics-intensive industries. (A full breakdown is provided in Table 1: List of Science-Based Industries & Groupings)

C.f. 2. Physics Classification *section for a discussion on the classification procedure, and an estimation of its effect on the analysis outputs.*

[5] https://www.iop.org/strategy/productivity-programme/physics-and-economy
[6] For example, removing *Shipyards and shipbuilding* and *FoodTech* from the physics-intensive definition.

1.3. Groupings

Each science-based industry was assigned to an industry grouping to:

- align more closely with definitions used externally and by investors;
- and reduce the dimensionality of the analysis and increase sample sizes.

This resulted in a list of 23 physics-intensive and 31 non-physics-intensive industry groupings. (A full breakdown is provided in Table 1: List of Science-Based Industries & Groupingsof the appendix.)

1.4. Companies

The data for all UK tracked (and previously tracked) companies (totalling 14,882) operating in at least one of the 86 science-based industries were downloaded from Beauhurst.[7]

1.5. Fundraisings

The data for all fundraisings (totalling an initial 10,144 UK-backed and a later set of 16,581 other-backed) related to these companies were downloaded from Beauhurst.

1.6. Processing

1.6.1. Companies

The company data were processed to:

- assign science industries and groupings;
- and fix date and numerical formats.

Companies were also assigned to an overall science category based on their combination of science groupings.[8] Additionally, the proportion of a company's groupings listed as physics-intensive (and the corresponding non-physics-intensive proportion) was computed.[9] (Some examples of company categorisation are given in Table 2: Company Science Categorisation Examples)
As a result of the processing and cleaning of company data, 14,746 companies were included in the analysis.[10]

1.6.2. Fundraisings

The fundraising data were processed to:

- extract investor-level information;

[7] Beauhurst Tracking Triggers (https://help.beauhurst.com/en/articles/8879510-what-are-the-beauhurst-tracking-triggers)
[8] One of Physics Only, Physics & Other Sciences, Other Sciences.
[9] Used throughout the analysis to produce binary views of physics vs. other sciences.
[10] Some companies were erroneously included in the download from Beauhurst that wouldn't later be classified as science-based.

- categorise the type of investment (UK-backed, VC-backed etc);
- ensure consistency between successive downloads (i.e. censoring any fundraisings after a specified date);
- and fix date and numerical formats.

Fundraisings were classified as being UK VC-backed if at least one of the investors had a head office in the UK and a fund type equal to *Commercialisation Company* or *Private Equity and Venture Capital*.
Fundraising data dated after 25/04/2024 were removed in order to ensure consistency with the company data downloaded on this date.
As a result of the processing and cleaning of fundraising data, 26,503 fundraising events were included in the analysis.

1.7. Uncertainties

There are several sources of (unquantified) uncertainty in the Beauhurst data, that are important enough to pull-out and describe in more detail. (Note that this is distinct from the estimation of uncertainty due to the IOP's analysis, found in 2. Physics Classification.)[11]

The first source of uncertainty relates to the assigning of companies into industries by Beauhurst. This process is unlikely to be perfect, and any single company may have incorrect (or missing) industries. For the purposes of this analysis, this uncertainty was assumed to be unbiased – affecting industries across the science spectrum equally.

Another source of error already within the Beauhurst data relates to the transcribing of financial information from company accounts and published transactions. This process is likely to result in some missing and incorrect information and may in the most egregious cases manifest as errors of magnitude or spuriously placed decimal points. For the purposes of this analysis, this uncertainty was assumed to be insignificant and unbiased – affecting companies across the science spectrum equally.

The final source of unavoidable uncertainty relates to the presence of 'undisclosed investors', a tag applied by Beauhurst to a fundraising event that contains one or more investors without detailed (or any) information. This has implications both for assessing the number of unique investors in any given deal, as well as the proportion of investors based in the UK (or elsewhere). In particular, the report makes use of fundraising data involving syndicates (4+ investors in a deal), which are harder to isolate without a standardised approach to handling 'undisclosed investors'. In this scenario, a fundraising with a single named investor and an undisclosed tag may have anywhere from 2 to 4+ investors. Roughly 1/3 of all UK VC-backed science fundraisings (and 1/3 of the value) since 2014 involve an undisclosed tag.

[11] There may be other sources of uncertainty within the data not considered for summary here.

2. Physics Classification

To compare physics fundraising to other sciences at a high level, it was necessary to classify UK science companies based on their attributed Beauhurst industries.[12] This was achieved through a combination of objective measures of the level of intense physics activity within each industry, and expert opinion leveraged at the IOP.

Given the subjective nature of this process, it could be argued that there exist other physics classifications that may have been used - for example if the opinions of the IOP analysis team were different, or if slightly modified empirical criteria were used. It's therefore important to explore how sensitive the outputs of this analysis are to changes in the initial definitions of what constitutes a physics-intensive industry (and therefore companies).

This sensitivity analysis has been performed to provide an estimate of the variance introduced by the IOP's physics classification process, and does not provide sampling errors or estimates of systematic uncertainty. This decision was taken since the classification process likely induces the largest amount of variance into the report outputs, much larger than a typical sampling error. Quoting a p-value or standard confidence intervals was therefore likely to be rather misleading, if the bigger source of error was unquantified. Report outputs are not presented with confidence intervals, but are evaluated within the context of the estimated variance due to the physics classification. This gives an indication of how volatile any findings are under different definitions of physics.

2.1. Decision Probability

The IOP's industry classification process can be represented by a set of probabilities assigned to each industry, relating to the relative likelihood of any one industry being classified as physics. (Note that the original classification process was *not* done within a probabilistic context, but the combination of subjective expertise and objective empiricism can be modelled reasonably well with a logistic regression estimator.)[13]

The logistic estimator-assigned probabilities can be used to construct myriad alternative definitions of physics, each comprising of a slightly different set of industries. This exercise effectively models the variance in a range of final outputs that is driven by the inclusion (and exclusion) of each industry, guided by their relative probabilities of being classified as physics (according to the IOP).[14] (10,000 alternative classifications of physics were built by sampling from the Binomial distribution for each industry, with means equal to the probabilities assigned by the logistic estimator.)

[12] C.f. *Data*.

[13] A logistic regression was built on a combination of the initial selection criteria outlined in *Physics Sectors (Data)* and the aggregate-level Physics Score, an IOP measure of physics research activity.

[14] The variance here is the variance explained by the initial physics classification model, not the sampling uncertainty.

2.2. Total UK VC-Backed Amount

In 3.2. Fundraising Proportions, the level of UK VC-backed fundraising going to physics companies is given as £7.43bn (30%). In 10,000 simulated alternative definitions of physics, 95% produce a figure between ~£4.8bn (20%) and ~£12.0bn (50%). Additionally, physics has a lower UK VC-backed amount in 98% of simulations. A histogram of these simulations can be found in Figure A4: Distribution of Simulated UK VC-Backed Physics Amounts.

2.3. 5-Year UK VC Fundraising Rate

In 4.1. Survival Analysis, the estimated 5-year UK VC-backed fundraising probability for Physics Only is given as 15%. In 10,000 simulated alternative definitions of physics, 95% produce a figure between ~13.4% and 19.6%. In 94.7% of the simulations, Physics Only companies had a lower estimated fundraising probability compared to Other Sciences. Histograms of these simulations can be found in Figure A5: Distribution of Simulated UK-VC Backed Fundraising Rates.

A 95% interval (derived from the inner 95 percentiles of the simulations) has also been added to the survival functions, which can be seen in Figure A6: Complemented Survival Functions with Simulated Variance Intervals.

2.4. Future Projection

In 5. Future Projection, the estimated 2025-2029 difference in funding for Physics Only under an even-footing scenario is given as £4.7bn. In 10,000 simulated alternative definitions of physics, 95% produce a figure between ~ -£1bn and £6bn. The 'observed' value (not observed per se, but the figure based on the actual classification) sits at the top end of the simulated distribution, which suggests it *might* be an overestimate. Caution must also be taken since this approach fits 10,000 x 3 = 30,000 linear regression models to the data - a broad distribution is a natural consequence of the multiplicative uncertainties. A histogram of these simulations can be found in Figure A7: Distribution of Simulated Future Projection Uplifts of the appendix.

2.5. Sole Investors

The average proportion of investors' Physics Only deals where they act as the sole investor is given as ~ 1/3. In 10,000 simulated alternative distributions of physics, 95% produce a figure between ~ 31.5% and 35.2%. The proportion in Physics Only is higher than Other Sciences in ~ 97% of simulations. A histogram of these simulations can be found in Figure A8: Distribution of Simulated Sole Investor Proportions.

2.4. Discussion

Whilst the variance in these estimates is rather high, it's also true that in most alternative physics classification scenarios, it's rather unlikely opposite conclusions would be drawn (i.e. physics companies have received more UK VC-backed fundraising, and Physics Only companies

have a higher probability of being backed by a UK-VC firm within 5 years). Note that this simulation does not fold-in an estimate of the sampling variance, due to computational complexity.

One area of weaker inference is the future projection of Physics Only funding under an even-footing scenario. The distribution of simulated figures is rather broad, although only the 'extreme' definitions result in a negative uplift. The point estimate itself sits in the upper half of the distribution (above the simulated mean) and therefore caution should be taken when quoting or referring to this figure.

3. Headline Stats

The data were initially analysed at a high-level to produce various headline stats related to the current pipeline of physics start-ups and the proportion of total fundraising and grant amounts raised by each science.

3.1. Active Companies

The total number of active physics startups was calculated by applying the following filters to the processed company data:

- active status in Companies House;
- no cessation date;
- at Seed or Venture stage in Beauhurst;[15]
- and less than/equal to 10 years old.

This resulted in **2,684** physics-intensive companies, split into 1,436 Physics Only and 1,248 Physics & Other Sciences.

3.2. Fundraising Proportions

The total (and proportional) amount of UK VC-backed funds raised by each science over the last 10 years was calculated as follows:

1. Select UK VC-backed fundraisings completed between 2014 and 2024.
2. Multiply each company's total fundraising amount separately by the assigned physics and other sciences proportions.
3. Sum these two quantities over all fundraisings.

This resulted in figures of **£7.43bn** (30%) for physics and **£16.98bn** (70%) for other sciences, that adjust for the relative proportion of physics (and other sciences) activity at the company level.

[15] https://help.beauhurst.com/en/articles/9189560-how-does-beauhurst-select-stages-of-evolution

3.3. Grant Proportions

The total (and proportional) amount of grant value awarded to each science over the last 10 years was calculated as follows:

1. Select companies incorporated between 2014 and 2024.[16]
2. Multiply each company's total grant value separately by the assigned physics and other sciences proportions.
3. Sum these two quantities over all companies.

This resulted in figures of **£1.24bn** (51%) for physics and **£1.19bn** (49%) for other sciences, that adjust for the relative proportion of physics (and other sciences) activity at the company level.

3.4. Overseas investment and Syndication

Analysis of overseas investment was done by taking all fundraisings captured (2014-2024), including both loan and equity fundraisings. Fundraisings were categorized according to whether all named investors were in the UK, all were Overseas, there was a mixture, or all were unknown.
There was additional categorization according to the number of investors, which results in some uncertainty: see section 1.7

4. Fundraising Probability

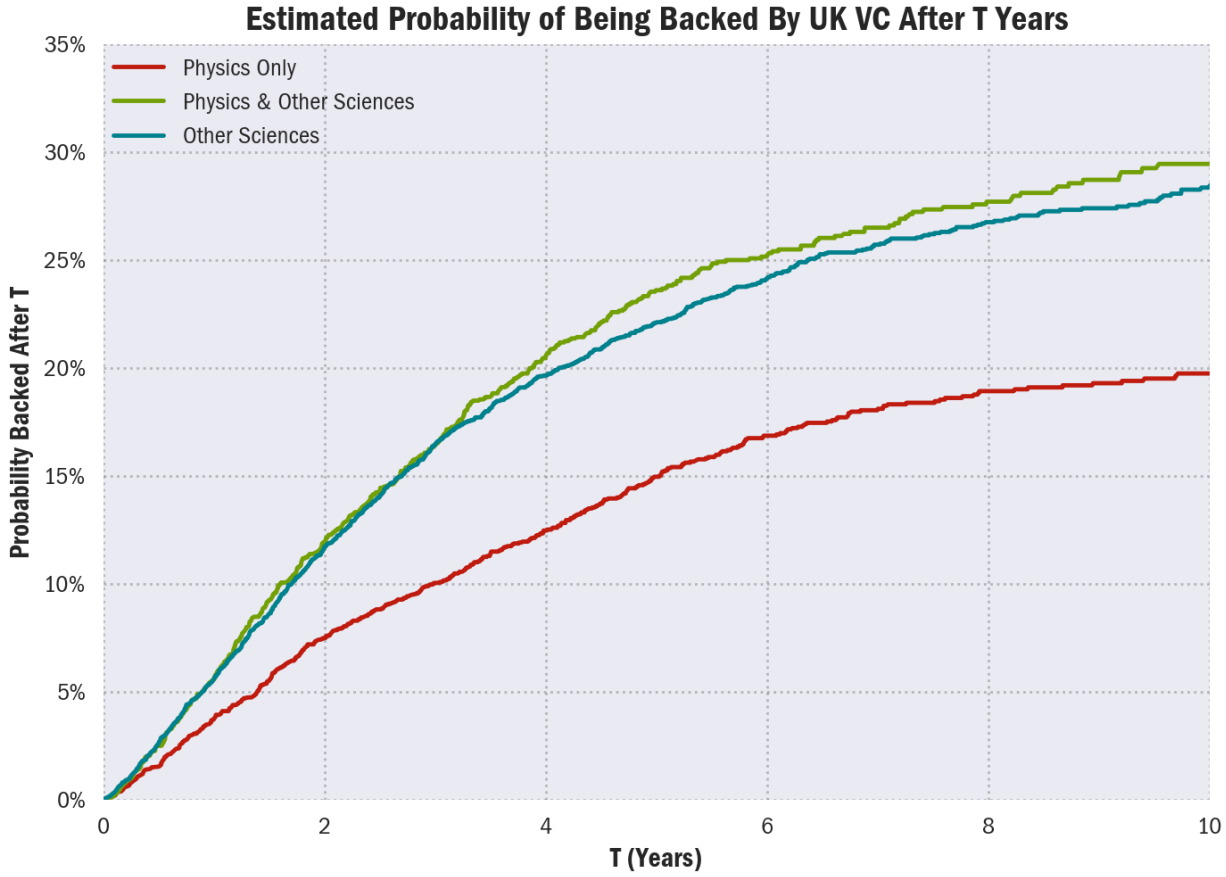
4.1. Survival Analysis

Since a standard approach to calculating the probability of being funded is liable to underestimate the true values – due to right censoring of the data – it was decided to also view the data through the lens of a survival analysis.[17] This approach natively handles the censoring of fundraising outcomes to produce an estimate of the overall survival function of companies operating in each science, maximising the amount of data available for each estimate.
The survival function by default represents the probability of *surviving* (i.e. here the probability of *not* being funded) past some time t so, for internal consistency and intelligibility, the complement of this (representing the probability of being funded as of time t) was calculated from the underlying survival function.
The date that each company is censored (from observing its first fundraising date) was calculated as the minimum of:

- the cessation date from Beauhurst;
- and the company data download date from Beauhurst.

[16] Chosen as granular grant-level data, amounts, and dates were not available.
[17] Survival analysis (https://en.wikipedia.org/wiki/Survival_analysis) implemented in Python with the lifelines package (https://lifelines.readthedocs.io/en/latest/).

Fundraising outcomes for each company were marked as 1 or 0 (corresponding to funded/unfunded) alongside calculated event durations (determined as the time between a fundraising or censoring and a company's incorporation).[18]
The analysis uses a Kaplan-Meier fitter to estimate the survival function for each science[19]. The plotted (complement) survival functions are shown in Figure 4 below.



[Figure 4: The complement of the fitted Kaplan-Meier estimated survival functions for each science, representing the probability of having been backed by UK VC after T=t years. Only companies incorporated since 2010 were included.]

The functions can be evaluated at a particular point in time (T=t years) to compare the estimated probability of having been backed already by UK VC between sciences. This resulted in the following estimated probabilities:

- P(backed by UK VC after 5 years | Physics Only) = ~ 15%
- P(backed by UK VC after 5 years | Other Sciences) = ~ 22%

The shape – and relationships - of the (complemented) survival functions match closely the observed curves (right censored; computed separately), but differ in their values due to the

[18] Processed using the built-in lifelines function datetimes_to_durations (https://lifelines.readthedocs.io/en/latest/lifelines.utils.html#:~:text=lifelines.utils.datetimes_to_durations).
[19] https://en.wikipedia.org/wiki/Kaplan%E2%80%93Meier_estimator

data used at each point in time as well as their underlying approach to retrieving probabilities.[20] The survival analysis assumes that the probability of being backed by UK VC is the same for all companies in each science.[21] A statistical test was not performed on the estimates from the survival analysis, but its figures are presented in the report due to its interpretability. A deeper analysis would examine the rate of change of the survival function as a function of when a company was incorporated.

[20] Notably, the survival analysis produces an *estimate* of the probability of being backed whereas Figure 2 deals purely with the observed data and proportions.

[21] This is an important statement that assumes a company incorporated in 2010 will behave the same as one incorporated in 2023. In the survival analysis this assumption is implicit - one survival function is estimated for all companies.

5. Future Projection

(Note: Future projecting has only been done for Physics Only / physics-intensive companies.)

To estimate the impact of an even-footing scenario (i.e. one where physics-intensive companies are backed by UK VC at the same rate as non-physics-intensive ones), historical yearly fundraising summaries for Physics Only were used to predict the amount of physics-intensive UK VC-backed fundraising between 2025-2029.[22]
To get the historical summaries, data for each year were compiled as follows (for Physics Only):

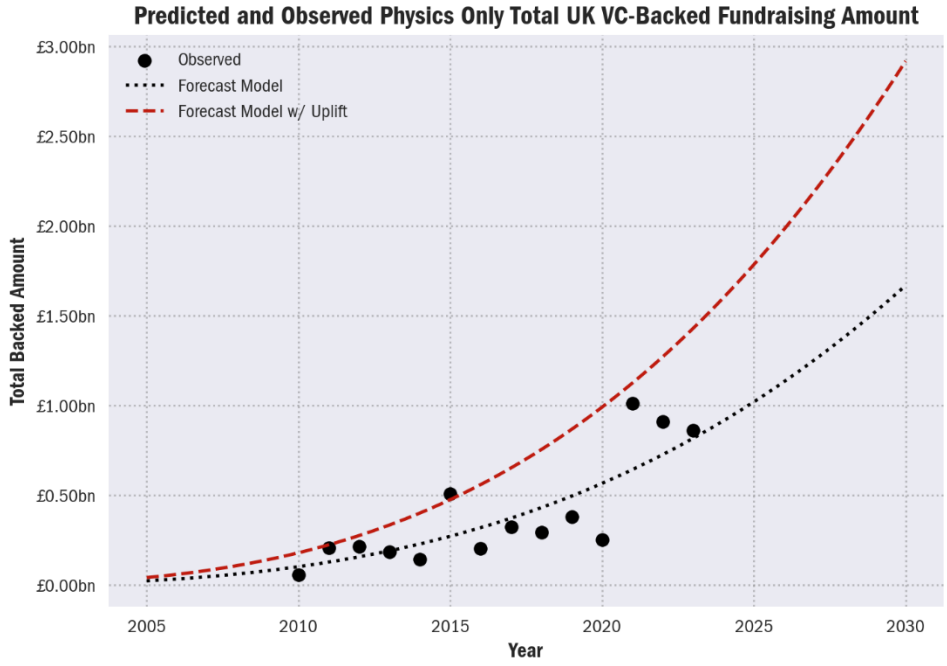
1. Identify active companies during year (already-incorporated and not-yet-ceased).
2. Extract UK VC-backed fundraisings for identified companies in year.
3. Determine the total UK-VC backed fundraising amount during year.
4. Determine the average UK VC-backed fundraising amount per company in year.
5. Determine the probability of being backed by UK VC during year.

An **uplift factor** was calculated using data from 2019-2023 and comparing the probability of being backed by UK VC for Physics Only and Other Sciences.[23]
Three individual single-feature linear regression models were built using the year (2010-2023) as a dependent variable with the following independent variables (taken from the historical summaries above):

1. the number of active companies;
2. the average conditional UK VC-backed fundraising amount;[24]
3. and the probability of being backed by UK VC.

The fitted models are shown with their residuals in Figures A1-A2 of the appendix.
The outputs of these three models can be multiplied together to retrieve the total VC-backed fundraising amount for Physics Only, per year. Figure 5 below shows this composite model compared to the observed data during 2010-2023. (The residuals for this can be seen in Figure A3 of the appendix.)

[22] Summaries were produced for 2010-2023.
[23] For each year (2019-2023), P(backed by UK VC | Other Sciences) was divided by P(backed by UK VC | Physics Only). These values were averaged over all years (2019-2023) to build the uplift factor, representing what an even-footing scenario may look like.
[24] Conditional on having been backed, i.e. E[fundraising amount | backed by UK VC].



[Figure 5: Composite model that estimates the total yearly UK VC-backed fundraising amount for Physics Only, built from 3 single-feature linear regression models. The green points represent the observed data. The black dotted line is the baseline composite model. The red dotted line is the composite model with an uplift factor. Note that the resulting composite model has non-linear interaction terms.]

If the output of model (3) is first multiplied by the uplift factor prior to its inclusion in the composite model, the projection represents what we estimate would happen under an even-footing scenario. This is shown in the red dotted line of Figure 5. If we take the difference between the red dotted line and the black dotted line between 2025 and 2029, we retrieve the estimated uplift (in terms of fundraising) that Physics Only companies would get if they were backed by UK VC at the same probability as Other Sciences.[25] This resulted in an estimate of **£4.73bn** over the next 5 years.

6. Survey

Survey Tables

Survey tables are included to show the characteristics of responders to the survey, and the sample size (15). Direct findings from the survey are included in the main report. Full question wording is included where too long to fit into the table, with a summary in the table header.

[25] This assumes that the monies are available, and all other factors modeled in the projection remain the same.

6.1. Survey Sample Details

6.1.1 When was your VC firm established?

When was your VC firm established?	Count	%
Within the last 10 Years	7	47%
More than 10 years ago	8	53%

6.1.2 When did you make your last investment?

When did you make your last investment?	Count	%
2024	13	87%
2023	2	13%

6.1.3 Which of these do you invest in?

Which of these do you invest in?	Count	%
All regions	10	45%
Individually Named Regions[26]	12	55%

6.1.4 Where are you based?

Where are you based?	Count	%
London	8	40%
Southwest	3	15%
East of England	2	10%
Scotland	2	10%
Other UK regions & nations	5	25%

6.1.5 Which of these physics deeptech sectors do you invest in?

We characterise the following industries and technologies as having high reliance on physics deep tech. Which, if any, of these industries and technologies have you made investments into? (Select all that apply - similar and overlapping areas are placed next to each other in the columns).

Which of these physics deeptech sectors do you invest in?	Yes	No	% saying yes	% saying no
Materials technology	15	0	100%	0%
Clinical diagnostics	12	3	80%	20%
Nanotechnology	11	4	73%	27%
Robotics and automation	11	4	73%	27%
Sensors	11	4	73%	27%

[26] Individually named regions grouped due to low counts- includes both responders who invested in only one specific place, or a limited combination of places.

Quantum	11	4	73%	27%
Medical devices and instruments	10	5	67%	33%
Semiconductors	10	5	67%	33%
Electrical components	9	6	60%	40%
Chips and processors	9	6	60%	40%
Energy storage	9	6	60%	40%
Energy management and reduction	8	7	53%	47%
Wearables	8	7	53%	47%
Satellite and space technology	7	8	47%	53%
Electrical and hybrid vehicles	7	8	47%	53%
Physical sciences research	6	9	40%	60%
Aerospace	6	9	40%	60%
Other energy (Exc. utilities and oil/coal/gas production and exploration)	5	10	33%	67%
Drones	5	10	33%	67%
Energy and fuel production (ex. oil, gas and coal)	5	10	33%	67%
Military and defence	4	11	27%	73%
3D printing	1	14	7%	93%
Cleantech	0	15	0%	100%
Smart energy	0	15	0%	100%
Nuclear energy	0	15	0%	100%
Other Energy	0	15	0%	100%
Robotic surgery	0	15	0%	100%
Renewable energy	0	15	0%	100%
Other Fuel Production	0	15	0%	100%
Other energy and fuel production (ex. fossil fuels)	0	15	0%	100%
Other space technology	0	15	0%	100%
None of the above	0	15	0%	100%

6.1.6 Which of these non-physics deeptech sectors do you invest in?

We characterise the following as industries and technologies where physics typically plays a less prominent role than other sciences. Which, if any, have you made investments into? (Select all that apply - similar and overlapping areas are placed next to each other in the columns):

Which of these sectors with less physics prominence do you invest in?	**Yes**	**No**	**% saying yes**	**% saying no**
Biotechnology	13	2	87%	13%

AI	12	3	80%	20%
Technology / IP based businesses not otherwise mentioned	11	4	73%	27%
Internet of things	11	4	73%	27%
Research tools & reagents	9	6	60%	40%
Genomics	9	6	60%	40%
AgriTech	8	7	53%	47%
eHealth	7	8	47%	53%
Precision medicine	7	8	47%	53%
Precision agriculture	7	8	47%	53%
Pharmaceuticals	7	8	47%	53%
Big data	7	8	47%	53%
Smart cities	7	8	47%	53%
Chemicals	7	8	47%	53%
Embedded systems & software	7	8	47%	53%
AR & VR	6	9	40%	60%
Clinical research	6	9	40%	60%
FoodTech	5	10	33%	67%
Image and voice recognition	5	10	33%	67%
Preventative care	5	10	33%	67%
FemTech	4	11	27%	73%
Construction Tech	3	12	20%	80%
Artificial meat and meat substitutes	3	12	20%	80%
AssistiveTech	3	12	20%	80%
Smart homes	3	12	20%	80%
Urban farming	3	12	20%	80%
Biometrics	2	13	13%	87%
Regenerative medicine	2	13	13%	87%
Coal, oil, and/or gas	1	14	7%	93%
The "quantified self"	1	14	7%	93%
Shipyards and shipbuilding	1	14	7%	93%
None of the above	1	14	7%	93%

6.1.7 What funding rounds do you typically make investments in?

What funding rounds do you typically make investments in? (Select all that apply).

Fundraising Round	**Count**	**%**
Pre-seed	14	38%
Seed	14	38%
Series A/B	9	24%

6.1.8 How many people are in your investment team?

How many people are in your investment team?	Count	%
Less than 5	5	33%
5 to 10	6	40%
11-20	1	7%
More than 20	3	20%

6.1.9 Did you or any of your investment team study for a physics-related qualification at university?

Did you or any of your investment team study for a physics-related qualification at university?	Count	%
Yes	10	67%
No	5	33%

6.1.10 What is the approximate representation of women in your investment team?

What is the approximate representation of women in your investment team?	Count	%
Less than half are women	8	53%
More than half are women	4	27%
Half are women	3	20%

6.1.11 Have you successfully raised a fund that will invest in part or wholly into physics deeptech?

Have you successfully raised a fund that will invest in part or wholly into physics deep tech?	Count	%
Yes	11	73%
Not sure	2	13%
No	2	13%

6.1.12 What was the size of the most recent fund that you closed?

What was the size of the most recent fund that you closed?	Count	%
Up to £20m	5	33%
More than £20m	5	33%
More than £20m	1	7%

Prefer not to say	4	27%

6.1.13 What sources of capital did you use to build your fund?

What sources of capital did you use to build your fund? (Select all that apply).

Source	Count	%
Family Offices	6	40%
UK Government (through BBB)	4	27%
Corporates	3	20%
Fund of funds	2	13%
Pension funds	1	7%
Prefer not to say	1	7%

6.1.14 What proportion of your funds go to physics deeptech?

What proportion of your fund(s) do you invest in physics deep tech?	Count	%
Less than 50%	10	71%
More than 50%	4	29%

6.1.15 On average, how long do you expect to hold your investments?

On average, how long do you typically expect to hold each of your investments for before they make a return?	Count	%
Less than 10 years	11	79%
More than 10 years	3	21%

6.1.16 Do you have plans to invest more in physics deeptech?

Do you have plans to invest in/invest more in physics deep tech in the next 3 years?	Count	%
Yes, at the same level	7	47%
Yes, ambition to grow investment in physics deep tech	6	40%
Not sure	2	13%

6.2 Survey Responses Referenced in Main Report

6.2.1 Is it harder / easier to raise funds for businesses in physics deep tech than other science sectors?

In your opinion, is it harder/easier to raise funds for businesses in physics deep tech than other science sectors?	**Count**	**%**
Harder	11	73%
Not sure	4	27%

6.2.2 What do you think are the main challenges to raising funds for physics deep tech?

What do you think are the main challenges to raising funds for physics deep tech? (Select all that apply)

Response (n = 15)	**Count**	**%**
Taking longer to return capital	13	87%
Limited Partner understanding of physics-related sectors, which may vary between Limited Partner types	10	67%
Appetite to invest into physics-related funds	9	60%
Needing to raising larger funds to allow for larger follow-on reserve	8	53%
Being able to identify and engage suitable international Limited Partners	7	47%
Awareness of UK science and technology strategy	5	33%
Attractiveness of UK versus international funds	4	27%
Need for making fewer investments and invest larger amounts per investment	2	13%
Other	1	7%
Relationship of non-UK Limited Partners with UK Limited Partners	1	7%

6.2.3 What would encourage you to start investing in physics deep tech / increase your investment into physics deeptech?

What would encourage you to start investing in physics deep tech / increase your investment into physics deep tech

What would encourage you to start investing in physics deep tech / increase your investment into physics deep tech	**Count**	**%**

Government support in physics infrastructure (including equipment, facilities, knowledge resources and	10	67%
Participation of corporate venture capital investors in funding rounds	8	53%
Stronger engagement of potential customers including overseas	7	47%
Exit market	6	40%
Investment readiness support for physics deep tech	6	40%
Secondary funds	5	33%
Support with technology due diligence	5	33%
Greater networking with physics deep tech	4	27%
Participation of high-net-worth individuals in funding rounds	4	27%
Specific tax breaks	4	27%
Novel funding models	3	20%
Leverage of venture debt	1	7%
Other (please specify):	4	27%

6.3 Survey Questions

Q1. What is your name (First name and Last name)?	Free Entry
Q2. What is your job title?	Free Entry
Q3. What is your firm's name?	Free Entry
Q4. Would you like your firm’s names to be published in our final report as a contributor?	Yes / No
Q5. Contact email address	Free Entry
Q6. When was your VC firm established?	Free Entry
Q7. When did you make your last investment?	Free Entry
Q8. Where are you based? (Select all that apply).	Q8.1. Scotland
	Q8.2. Wales
	Q8.3. Northern Ireland
	Q8.4. Southeast
	Q8.5. Southwest
	Q8.6. London
	Q8.7. East of England
	Q8.8. East Midlands

	Q8.9. West Midlands
	Q8.10. Northeast
	Q8.11. Northwest
Q9. What geographical regions of the UK do you currently invest in? (Select all that apply).	Q9.1. All regions
	Q9.2. Scotland
	Q9.3. Wales
	Q9.4. Northern Ireland
	Q9.5. Southeast
	Q9.6. Southwest
	Q9.7. London
	Q9.8. East of England
	Q9.9. East Midlands
	Q9.10. West Midlands
	Q9.11. Northeast
	Q9.12. Northwest
Q10. We characterise the following industries and technologies as having high reliance on physics deep tech. Which, if any, of these industries and technologies have you made investments into? (Select all that apply - similar and overlapping areas are placed next to each other in the columns).	Q10.1. Satellite and space technology
	Q10.2. Other space technology
	Q10.3. Sensors
	Q10.4. Quantum
	Q10.5. Drones
	Q10.6. Military and defence
	Q10.7. Aerospace
	Q10.8. Chips and processors
	Q10.9. Electrical components
	Q10.10. Semiconductors
	Q10.11. Materials technology
	Q10.12. Nanotechnology
	Q10.13. 3D printing
	Q10.14. Robotics and automation
	Q10.15. Robotic surgery
	Q10.16. Wearables
	Q10.17. Clinical diagnostics
	Q10.18. Medical devices and instruments
	Q10.19. Physical sciences research
	Q10.20. Energy and fuel production (ex. oil, gas and coal)
	Q10.21. Energy management and reduction
	Q10.22. Energy storage
	Q10.23. Other energy (Exc. utilities and oil/coal/gas production and exploration)
	Q10.24. Renewable energy
	Q10.25. Nuclear energy

	Q10.26. Other energy and fuel production (ex. fossil fuels)
	Q10.27. Smart energy
	Q10.28. Cleantech
	Q10.29. Electrical and hybrid vehicles
	Q10.30. Other Energy
	Q10.31. Other Fuel Production
	Q10.32. None of the above
Q11. We characterise the following as industries and technologies where physics typically plays a less prominent role than other sciences. Which, if any, have you made investments into?(Select all that apply - similar and overlapping areas are placed next to each other in the columns).	Q11.1. Biotechnology
	Q11.2. Clinical research
	Q11.3. Research tools & reagents
	Q11.4. Precision medicine
	Q11.5. Pharmaceuticals
	Q11.6. Biometrics
	Q11.7. FemTech
	Q11.8. Genomics
	Q11.9. eHealth
	Q11.10. Preventative care
	Q11.11. Regenerative medicine
	Q11.12. Precision agriculture
	Q11.13. Artificial meat and meat substitutes
	Q11.14. FoodTech
	Q11.15. AgriTech
	Q11.16. Urban farming
	Q11.17. Chemicals
	Q11.18. Construction Tech
	Q11.19. Smart cities
	Q11.20. Smart homes
	Q11.21. Coal, oil, and/or gas
	Q11.22. Shipyards and shipbuilding
	Q11.23. Embedded systems & software
	Q11.24. AI
	Q11.25. AR & VR
	Q11.26. AssistiveTech
	Q11.27. Big data
	Q11.28. Image and voice recognition
	Q11.29. Internet of things
	Q11.30. The "quantified self"
	Q11.31. Technology / IP based businesses not otherwise mentioned
	Q11.32. None of the above
	Q12.1. Pre-seed

Q12. What funding rounds do you typically make investments in? (Select all that apply).	Q12.2. Seed
	Q12.3. Series A
	Q12.4. Series B
	Q12.5. Series C
	Q12.6. Not sure
	Q12.7. Prefer not to say
Q13. Approximately, what is the highest number of new investments that you've made in any single fund?	
Q14. How many people are in your investment team?	
Q15. Did you or any of your investment team study for a physics-related qualification at university?	Yes / No
Q16. What is the approximate representation of women in your investment team?	More than half are women / Half are women / Less than half are women
Q17. Have you successfully raised a fund that will invest in part or wholly into physics deep tech?	Yes / No
Q18. In your opinion, is it harder/easier to raise funds for businesses in physics deep tech than other science sectors?	Harder / Easier / Not Sure
	Why is that the case?
Q19. What do you think are the main challenges to raising funds for physics deep tech? (Select all that apply)	Q19.1. Taking longer to return capital
	Q19.2. Awareness of UK science and technology strategy
	Q19.3. Attractiveness of UK versus international funds
	Q19.4. Being able to identify and engage suitable international Limited Partners
	Q19.5. Needing to raising larger funds to allow for larger follow-on reserve
	Q19.6. Need for making fewer investments and invest larger amounts per investment
	Q19.7. Relationship of non-UK Limited Partners with UK Limited Partners
	Q19.8. Appetite to invest into physics-related funds
	Q19.9. Limited Partner understanding of physics-related sectors, which may vary between Limited Partner types
	Q19.10. No barriers
	Q19.11. Not sure
	Q19.12. Other (please specify):
Q20. What was the size of the most recent fund that you closed?	Free Entry
Q21. What sources of capital did you use to build your fund? (Select all that apply).	Q21.1. Pension funds
	Q21.2. Family Offices
	Q21.3. Corporates

	Q21.4. Fund of funds
	Q21.5. Sovereign wealth fund
	Q21.6. UK Government (through BBB)
	Q21.7. Shareholders of listed funds
	Q21.8. Not sure
	Q21.9. Prefer not to say
	Q21.10. Other (please specify):
Q22. In your opinion, where would you rank the UK in terms of favourability for investment in science-related sectors , in relation to other countries that receive the biggest VC investment? Please rank, by dragging and dropping, the following countries in terms of favourability for investment into science-related sectors, with 5 being most favourable and 1 being least favourable.	Q22.1. US
	Q22.2. China
	Q22.3. UK
	Q22.4. India
	Q22.5. France
Q23. What proportion of your fund(s) do you invest in physics deep tech?	None, Less than 25%, Less than 50%, Less than 75%, More than 75%
Q24. What is the top reason that makes other science-related sectors attractive to investment, relative to physics deep tech? For example there are clearer market opportunities in life sciences compared to physics deep tech or it is easier to evaluate start-ups in other science-related sectors.	Free Entry
What are the main barriers that are preventing you from investing in physics deep tech? (Select all that apply)	Q25.1. Time and cost to prove technology and business model
	Q25.2. Time to get to market
	Q25.3. Unclear market opportunity
	Q25.4. Scalability
	Q25.5. Ability to recruit team
	Q25.6. Availability of relevant mentors and non-Executive Directors
	Q25.7. Access to technical knowledge
	Q25.8. Lower initial rate of return
	Q25.9. Less commercially mature
	Q25.10. Less investment ready
	Q25.11. Difficulties in assessing companies / technology due diligence
	Q25.12. Failure rate
	Q25.13. Government investment in infrastructure (including equipment, facilities, knowledge resources and e-infrastructure)
	Q25.14. Limited ways to de-risk investment
	Q25.15. Risk of flight from UK
	Q25.16. No barriers

	Q25.17. Not sure
	Q25.18. Other (please specify):
Q26. In your previous answer, you indicated that you make investments into physics deep tech . What is the top reason that makes start-ups in physics deep tech attractive to investment, relative to other science-related sectors? For example there are clearer market opportunities in physics deep tech or it is easier to evaluate start-ups in physics deep tech.	
Q27. What are the main challenges that are preventing you from investing more into physics deep tech? (Select all that apply)	Q27.1. Time and cost to prove technology and business model
	Q27.2. Time to get to market
	Q27.3. Unclear market opportunity
	Q27.4. Scalability
	Q27.5. Ability to recruit team
	Q27.6. Availability of relevant mentors and non-Executive Directors
	Q27.7. Access to technical knowledge
	Q27.8. Lower initial rate of return
	Q27.9. Less commercially mature
	Q27.10. Less investment ready
	Q27.11. Difficulties in assessing companies / technology due diligence.
	Q27.12. Failure rate
	Q27.13. Government investment in infrastructure (including equipment, facilities, knowledge resources and e-infrastructure)
	Q27.14. Limited ways to de-risk investment
	Q27.15. Risk of flight
	Q27.16. No barriers
	Q27.17. Not sure
	Q27.18. Other (please specify):
Q28. What differences, if any, do you see in the attractiveness of businesses operating in different physics deep tech sectors? E.g., semiconductor businesses are more commercially mature than quantum businesses or there is more UK infrastructure to support the growth of energy storage businesses than space businesses.	Free Entry
Q29. We are interested in understanding if there are areas of physics deep tech that are currently under-invested in the UK. What areas, if any, could greater levels of investment be unlocked in physics deep tech?	Free Entry

Q30. On average, how long do you typically expect to hold each of your investments for before they make a return?	Less than 5 Years, Less than 10 Years, More than 10 Years, Prefer not to say
Q31. What are the main factors that influence the speed of your return on investment?	Free Entry
Q32. How do you expect the cumulative amount of capital that needs to be raised by physics deep tech before exit will compare to other science-related sectors?	Cumulative capital will be about the same. / Not sure / Cumulative Capital will be Less.
Q32. How do you expect the cumulative amount of capital that needs to be raised by physics deep tech before exit will compare to other science-related sectors?	Please provide a reason:
Q33. How do you think the failure rate of start-ups in physics deep tech compares to other science-related sectors?	Answer
Q33. How do you think the failure rate of start-ups in physics deep tech compares to other science-related sectors?	Please provide a reason:
Q34. Our initial analysis suggests that companies working in physics deep tech that are based in London, the East of England and South East of England are more likely to receive VC investment as part of their funding portfolio. What do you think might contribute to this effect? (Select all that apply)	Q34.1. Availability of technical expertise locally
	Q34.2. Access to local networks of founders, advisors, Non-Executive Directors
	Q34.3. Investor readiness
	Q34.4. Local community of start-ups and spinouts
	Q34.5. General sentiment and relationships between investors and these three areas.
	Q34.6. Ambition
	Q34.7. All of the above
	Q34.8. Other (please specify):
Q35. What could be done to encourage more investment into companies working in physics deep tech that are based in UK regions and Nations outside of London, the East of England and South East of England?	Free Entry
Q36. We are interested in understanding your experiences of the diversity of founding teams in the companies that you invest. To what extent are women represented in founding teams in the companies that you invest in?	In less than half of founding teams, In more than half of all instances
Q37. We are trying to better understand why companies with all-female and mixed gender founding teams might receive less investment than all-male founding teams. In your opinion, why do you think this might be the case in physics deep tech and other science-related sectors?	Free Entry

Q38. What, if anything, do you think could be done to improve the experiences of all-female and mixed gender founding teams in seeking investment?	Free Entry
Q39. Do you have plans to invest in/invest more in physics deep tech in the next 3 years?	Yes, ambition to grow investment in physics deep tech / Yes, at the same level / No / Not Sure
Q40. What would encourage you to start investing in physics deep tech / increase your investment into physics deep tech? (Select all that apply)	Q40.1. Novel funding models
	Q40.2. Leverage of venture debt
	Q40.3. Secondary funds
	Q40.4. Specific tax breaks
	Q40.5. Government support in physics infrastructure (including equipment, facilities, knowledge resources and e-infrastructure)
	Q40.6. Stronger engagement of potential customers including overseas
	Q40.7. Support with technology due diligence
	Q40.8. Greater networking with physics deep tech
	Q40.9. Investment readiness support for physics deep tech
	Q40.10. Participation of corporate venture capital investors in funding rounds
	Q40.11. Participation of high-net-worth individuals in funding rounds
	Q40.12. Exit market
	Q40.13. None of the above
	Q40.14. Not sure
	Q40.15. Other (please specify):
Q41. If the Government could do one thing to stimulate more investment into physics deep tech , what would that be?	Free Entry
Q42. If IOP could do one thing to support VC firms to stimulate more investment into physics deep tech , what would that be?	Free Entry
Q43. Would you like to provide any other comments about your responses in this survey?	Free Entry
Q44. Would you like to receive emails about the work we do, invitations to events and webinars, information about how you can get involved, competitions and surveys we run from time to time, and our additional products, services and activities that may be of interest to you?You can stop these updates any time by clicking the unsubscribe link in our emails. The IOP takes your privacy seriously and is committed to protecting the personal information you share with us. For more details	Yes / No

about how we handle your personal information, and your rights, please see our Privacy Notice.	

Appendix

Tables

Table 1: List of Science-Based Industries & Groupings

Name	Type	Grouping	Is Physics?
3D printing	Buzzword	3D printing	True
Aerospace	Sector	Aerospace	True
AgriTech	Buzzword	AgriTech	False
Artificial Intelligence	Buzzword	AI	False
Artificial meat and meat substitutes	Buzzword	Artificial meat and meat substitutes	False
AssistiveTech	Buzzword	AssistiveTech	False
Augmented reality	Buzzword	AR & VR	False
Autonomous vehicles	Buzzword	Robotics and Automation	True
Big data	Buzzword	Big data	False
Biomass and biofuels	Buzzword	Energy & Fuel Production (Ex. Coal / Gas / Oil)	True
Biometrics	Buzzword	Biometrics	False
Biotechnology	Industry	Biotechnology	False
Chemicals	Industry	Chemicals	False
Chemicals	Sector	Chemicals	False
Chips and processors	Industry	Chips and processors	True
Chips and processors	Sector	Chips and processors	True
Clean energy generation	Sector	Energy & Fuel Production (Ex. Coal / Gas / Oil)	True
CleanTech	Buzzword	Energy management and reduction	True
Clinical diagnostics	Industry	Clinical diagnostics	True
Clinical diagnostics	Sector	Clinical diagnostics	True
Clinical research	Industry	Clinical research	False
Coal	Sector	Coal, Oil &/or Gas	False
ConTech	Buzzword	ConTech	False
Defence	Sector	Military and Defence	True
Drones	Buzzword	Drones	True
Electric and hybrid vehicles	Buzzword	Electric and hybrid vehicles	True

Electrical components	Sector	Electrical components	True
Electricity generation	Industry	Energy & Fuel Production (Ex. Coal / Gas / Oil)	True
Embedded software	Sector	Embedded Systems & Software	False
Embedded systems	Industry	Embedded Systems & Software	False
Energy management and reduction	Industry	Energy management and reduction	True
Energy production	Sector	Energy & Fuel Production (Ex. Coal / Gas / Oil)	True
Energy reduction technology	Sector	Energy management and reduction	True
Energy storage	Industry	Energy Storage	True
FemTech	Buzzword	FemTech	False
FoodTech	Buzzword	FoodTech	False
Genomics	Buzzword	Genomics	False
Geospatial technology	Buzzword	Space / Satellite Technology	True
Graphene	Buzzword	Materials Technology	True
Image and voice recognition	Buzzword	Image and voice recognition	False
Internet of Things	Buzzword	Internet of Things	False
Materials technology	Industry	Materials Technology	True
Materials technology	Sector	Materials Technology	True
Medical devices	Sector	Medical Devices and Instruments	True
Medical devices and instruments	Industry	Medical Devices and Instruments	True
Medical instrumentation	Sector	Medical Devices and Instruments	True
Metamaterials	Buzzword	Materials Technology	True
Military and defence	Industry	Military and Defence	True
Nanotechnology	Buzzword	Nanotechnology	True
Nanotechnology	Sector	Nanotechnology	True
Nuclear energy	Industry	Energy & Fuel Production (Ex. Coal / Gas / Oil)	True
Oil and gas	Sector	Coal, Oil &/or Gas	False
Other CleanTech	Sector	Energy management and reduction	True
Other energy	Sector	Other Energy (Ex. Utilities, Coal, Oil, & Gas)	True
Other fuel production	Sector	Energy & Fuel Production (Ex. Coal / Gas / Oil)	True
Other technology/IP-based businesses	Sector	Other technology/IP-based businesses	False
Pharmaceuticals	Industry	Pharmaceuticals	False
Pharmaceuticals	Sector	Pharmaceuticals	False
Physical sciences research	Industry	Physical sciences research	True
Precision agriculture	Buzzword	Precision agriculture	False
Precision medicine	Buzzword	Precision medicine	False
Preventive care	Buzzword	Preventive care	False
Quantum	Buzzword	Quantum	True
Regenerative medicine	Buzzword	Regenerative medicine	False

Renewable energy	Industry	Energy & Fuel Production (Ex. Coal / Gas / Oil)	True
Research tools and reagents	Industry	Research Tools & Reagents	False
Research tools/reagents	Sector	Research Tools & Reagents	False
Robotic surgery	Buzzword	Robotic Surgery	True
Robotics	Buzzword	Robotics and Automation	True
Robots and automation	Industry	Robotics and Automation	True
Satellite hardware	Industry	Space / Satellite Technology	True
Semiconductors	Sector	Semiconductors	True
Sensors	Industry	Sensors	True
Shipyards and shipbuilding	Industry	Shipyards and shipbuilding	False
Smart cities	Buzzword	Smart cities	False
Smart energy	Buzzword	Energy management and reduction	True
Smart homes	Buzzword	Smart homes	False
Space infrastructure	Industry	Space / Satellite Technology	True
Space travel operators	Industry	Space / Satellite Technology	True
Spacecraft	Industry	Space / Satellite Technology	True
Synthetic biology	Buzzword	Biotechnology	False
The "quantified self"	Buzzword	The "quantified self"	False
Urban farming	Buzzword	Urban farming	False
Virtual reality	Buzzword	AR & VR	False
Wearables	Buzzword	Wearables	True
eHealth	Buzzword	eHealth	False

Table 2: Company Science Categorisation Examples

Company A

Field	Value
Science groupings	Chips and processors
Physics groupings	Chips and processors
Science	Physics Only
Physics proportion	1

Company B

Field	Value
Science groupings	AI, Clinical diagnostics
Physics groupings	Clinical diagnostics
Science	Physics & Other Sciences
Physics proportion	0.5

Table 3: International Investment and Syndication Tables

Filters: Deals taking place 2014-2022 only. Includes Equity and Loan fundraisings. Excludes deals where all investor locations are unknown / not disclosed.

Table 3.1

		Investor Locations	
Science Industry Grouping	**Measure**	**Overseas investors only & UK & Overseas investors**	**UK Investors only**
Other Sciences	% of Total Amount raised (converted to GBP)	58%	46%
Physics & Other Sciences		19%	19%
Physics Only		23%	35%

Table 3.2

		Investor Locations	
Science Industry Grouping	**Measure**	**Overseas investors only & UK & Overseas investors**	**UK Investors only**
Other Sciences	% of unique deals	57%	44%
Physics & Other Sciences		24%	26%
Physics Only		19%	29%

Table 3.3

Filters: Excludes fundraisings from already-exited companies. Deal Date is 2014-2024 inclusive. Number of investors describes the number of unique investors.
Caveat:

Where any of the investors in the source data are described as “undisclosed investors” the true number of investors is unknown, as “unknown investors” could refer to one unknown investor, or several unknown investors.
The “Number of named Investors” column refers to the number of unique investors associated with the fundraising. In cases where the only investor is “undisclosed investors”, these are labelled “all undisclosed”.
This means in the case of the labels “2”, “3”, and “2&3”, in some cases the true number of investors may be higher.
The label “1” in Number of named investors means that the whole of the deal comes from one named investor.
The label “4+” means that there are at least 4 distinct investors (i.e. at least 3 named investors, and at least one additional investor (named or unnamed).
All undisclosed means that the only investor mentioned was “undisclosed investors”.

			Stage of evolution at deal date		
Business Type	Number of named Investors	Measure	Seed	Venture	Established & Growth
Physics Only	1	% of Total Amount raised (converted to GBP)	**17%**	15%	18%
	2 & 3		20%	24%	23%
	4+		17%	27%	43%
	all undisclosed		46%	34%	16%
	Total		**100%**	**100%**	**100%**
Physics & Other Sciences	1	% of Total Amount raised (converted to GBP)	7%	7%	9%
	2 & 3		23%	23%	18%
	4+		23%	39%	55%
	all undisclosed		48%	30%	18%
	Total		**100%**	**100%**	**100%**
Other Sciences Only	1	% of Total Amount raised (converted to GBP)	**10%**	6%	11%
	2 & 3		23%	21%	27%
	4+		29%	46%	45%
	all undisclosed		39%	27%	17%
	Total		**100%**	**100%**	**100%**

Table 3.4.1

Number of Deals by number of investors: Science categories.2014-2024 deals. Exc. ones where all investors are unknown.

	Science Grouping

Investors	Physics Only	Other Sciences Only	Physics & Other Sciences
1	1,145	1,555	852
2	711	1,177	653
3	290	687	368
4+	419	1,032	594

Table 3.4.2

Number of Deals by number of investors: Science categories.2014-2024 deals. Exc. ones where all investors are unknown. ***Growth and Established firms (at time of investment) only.***

	Science Classification		
Investors	Physics Only	Other Sciences Only	Physics & Other Sciences
1	310	310	124
2	128	162	91
3	60	100	51
4+	83	188	111

Table 3.5

% of deals by number of investors, and number of deals. 2014-2024. **Investment into seed-stage companies only.**

Physics-only seed companies receive 27% of single-investor fundraisings, but only 23% of multiple-investor fundraisings. Other sciences-only receive 48% of single-investor seed fundraisings, but 52% of seed level multiple investor fundraisings.

	Science Classification			
Investor Type	Physics Only	Other Sciences Only	Physics & Other Sciences	Grand Total
Single Investor	27% (436)	48% (782)	26% (423)	100% (1,641)
Multiple Investors	23% (545)	52% (1,217)	25% (600)	100% (2,362)
unknown (all undisclosed)	28% (2,096)	50% (3,833)	22% (1,667)	100% (7,596)
All	27% (3,077)	50% (5,832)	23% (2690)	100% (11,599)

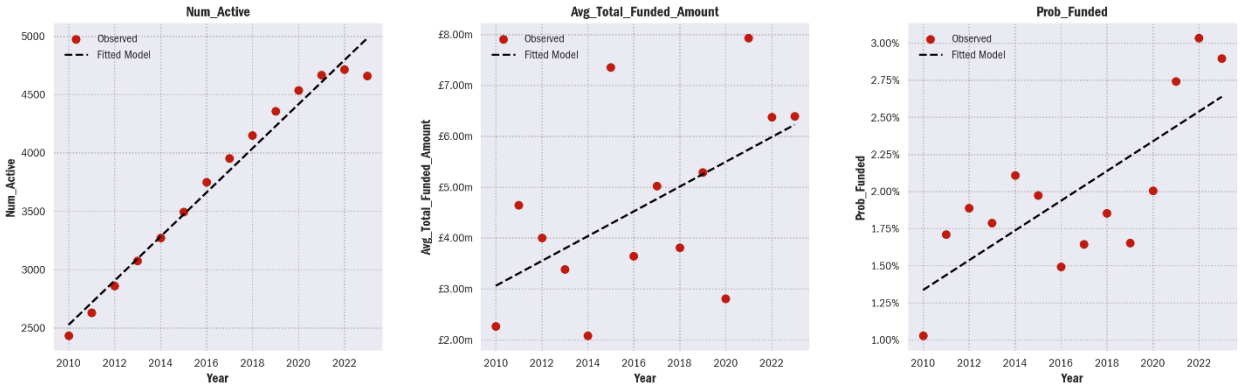
Table 3.6

Amount raised by companies in science industries, by whether funded firms appear only in physics deep tech, other science industries only, or a combination of the two. All stages of development. All fundraising types. 2014-2024.

Business Type	Number of named Investors	% of Total Amount raised (converted to GBP)	Amount raised (converted to GBP)
Physics Only	1	17%	£3.17B
	2 & 3	23%	£4.19B
	4+	35%	£6.38B
	all undisclosed	25%	£4.66B
	Total	100%	£18.41B
Physics & Other Sciences	1	8%	£1.02B
	2 & 3	21%	£2.67B
	4+	44%	£5.69B
	all undisclosed	28%	£3.58B
	Total	100%	£12.95B
Other Sciences Only	1	10%	£3.17B
	2 & 3	24%	£8.01B
	4+	42%	£14.00B
	all undisclosed	24%	£8.07B
	Total	100%	£33.24B

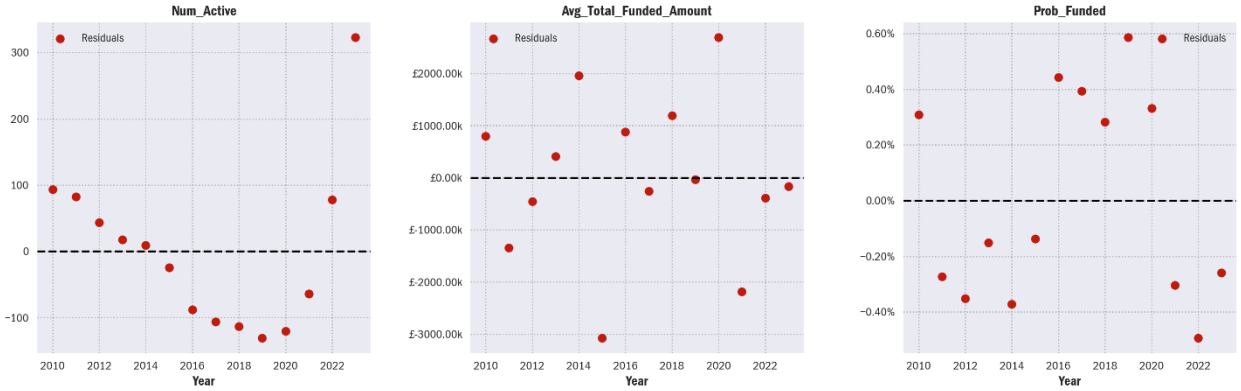
Figures

Figure A1: Fitted Single-Feature Linear Regression Models



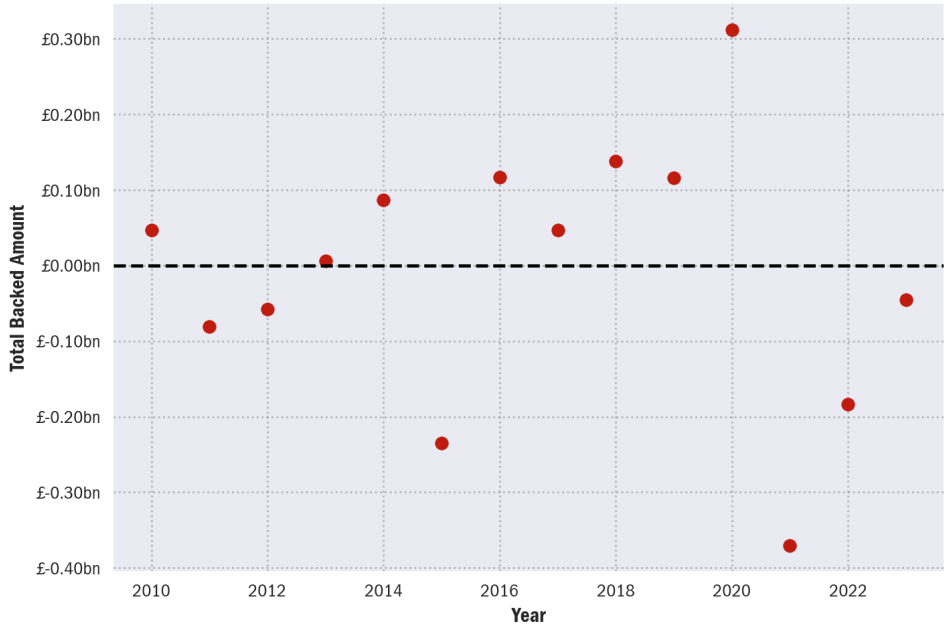
[Figure A1: Fitted linear regression models and the fitting data, for Physics Only companies.]

Figure A2: Fitted Single-Feature Linear Regression Model Residuals



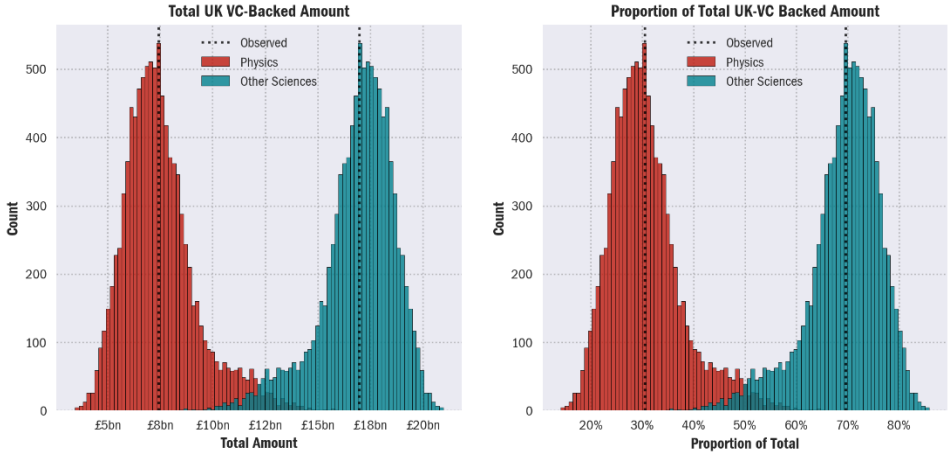
[Figure A2: Fitted linear regression model residuals, for Physics Only companies.]

Figure A3: Composite Projection Model Residuals



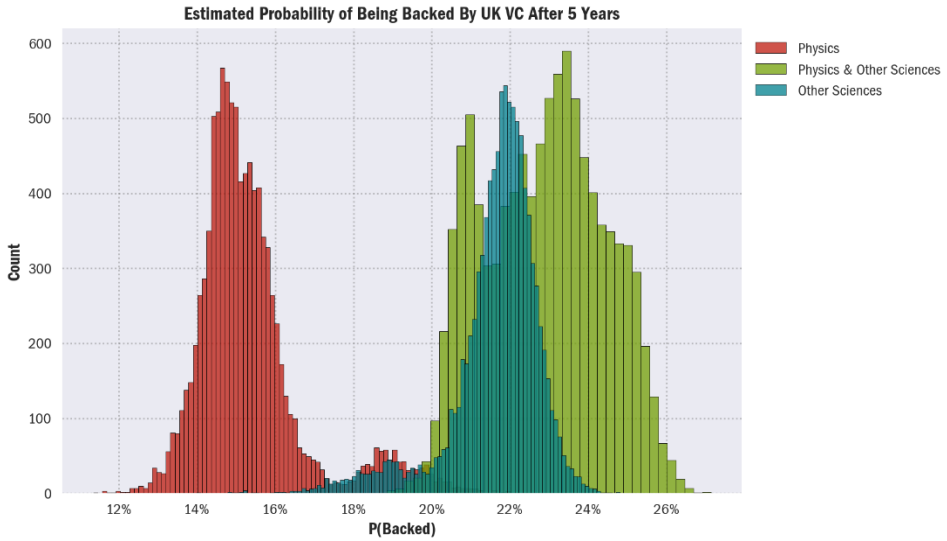
[Figure A3: Residuals from the composite projection model for total UK VC-backed fundraising amount, for Physics Only.]

Figure A4: Distribution of Simulated UK VC-Backed Physics Amounts



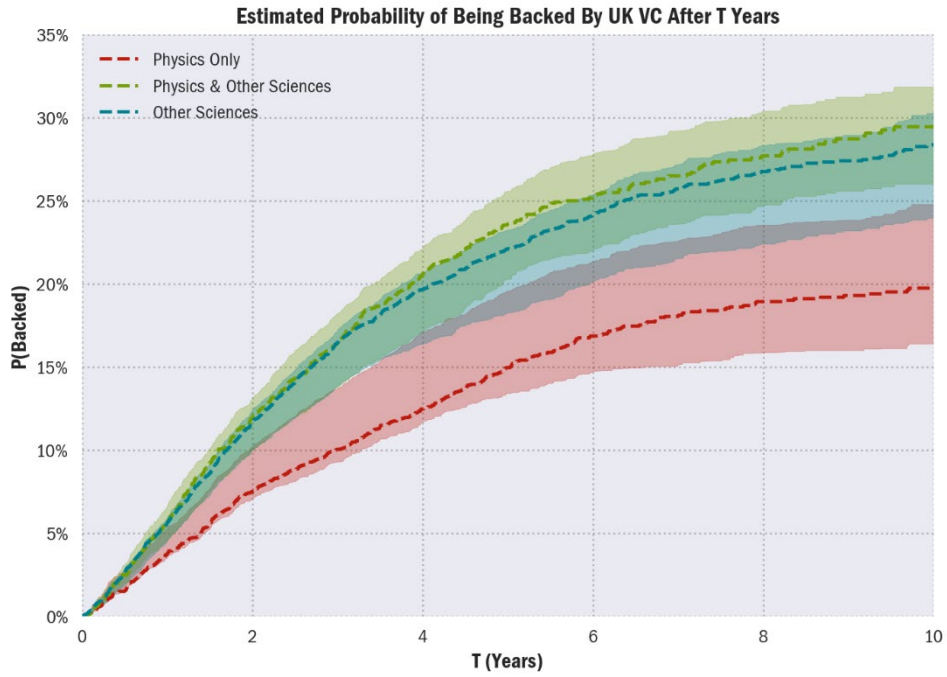
[Figure A4: A distribution of physics companies UK VC-backed fundraising amounts and proportions between 2014-2024, generated through 10,000 simulated reconstructions of alternative physics definitions.]

Figure A5: Distribution of Simulated UK-VC Backed Fundraising Rates



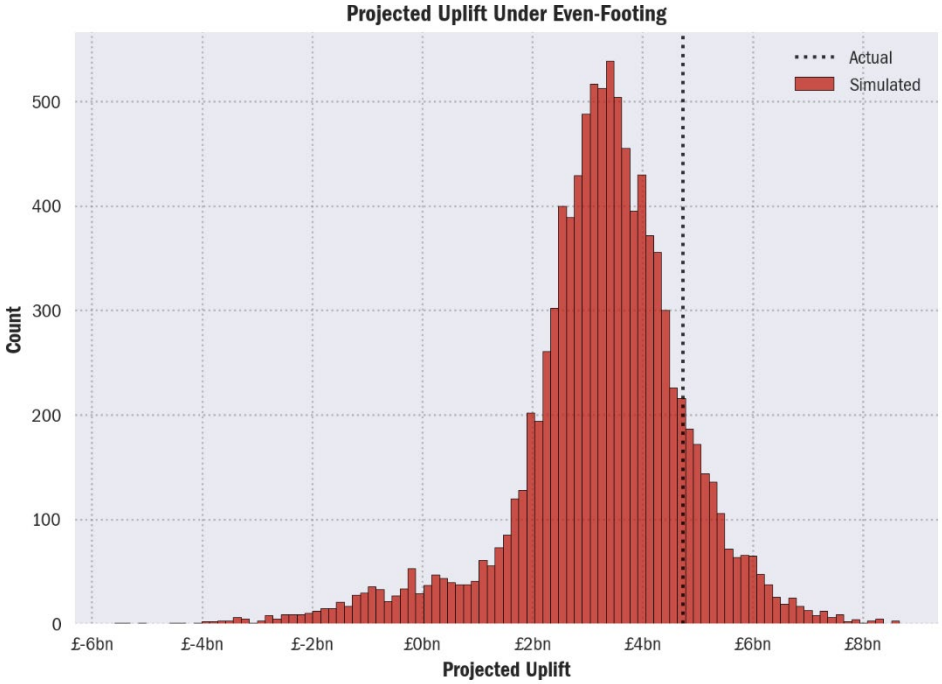
[Figure A5: Distributions of Physics Only and Other Sciences UK VC-Backed estimated 5-Year fundraising probabilities between 2010-2024, generated through 10,000 simulated reconstructions of alternative physics definitions.]

Figure A6: Complemented Survival Functions with Simulated Variance Intervals



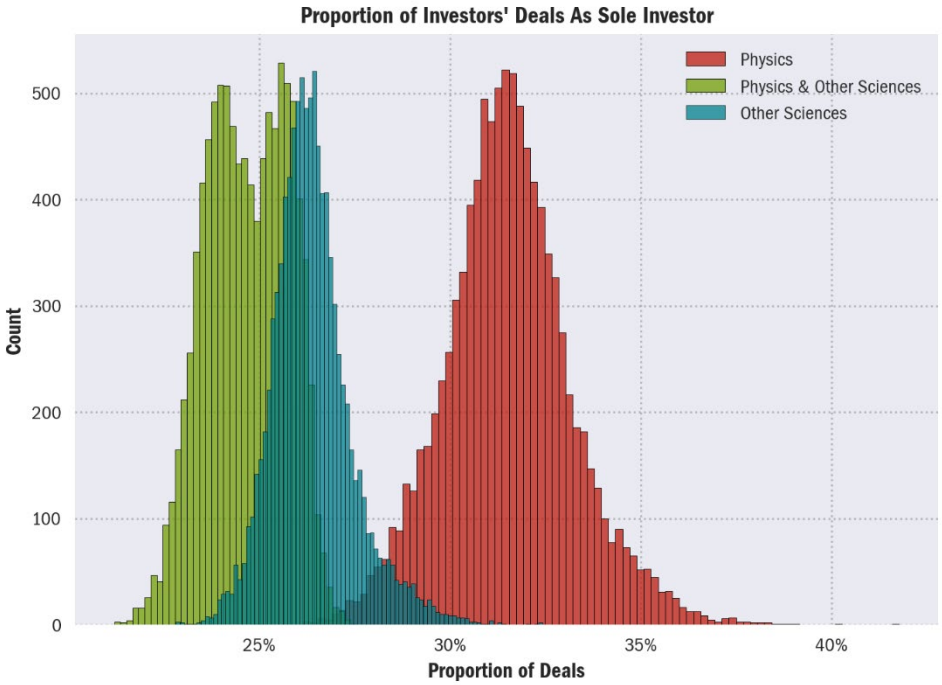
[Figure A6: Complements of the estimated survival functions with 95% variance intervals, derived through simulated sensitivity analysis 10,000 reconstructions of alternative physics definitions.]

Figure A7: Distribution of Simulated Future Projection Uplifts



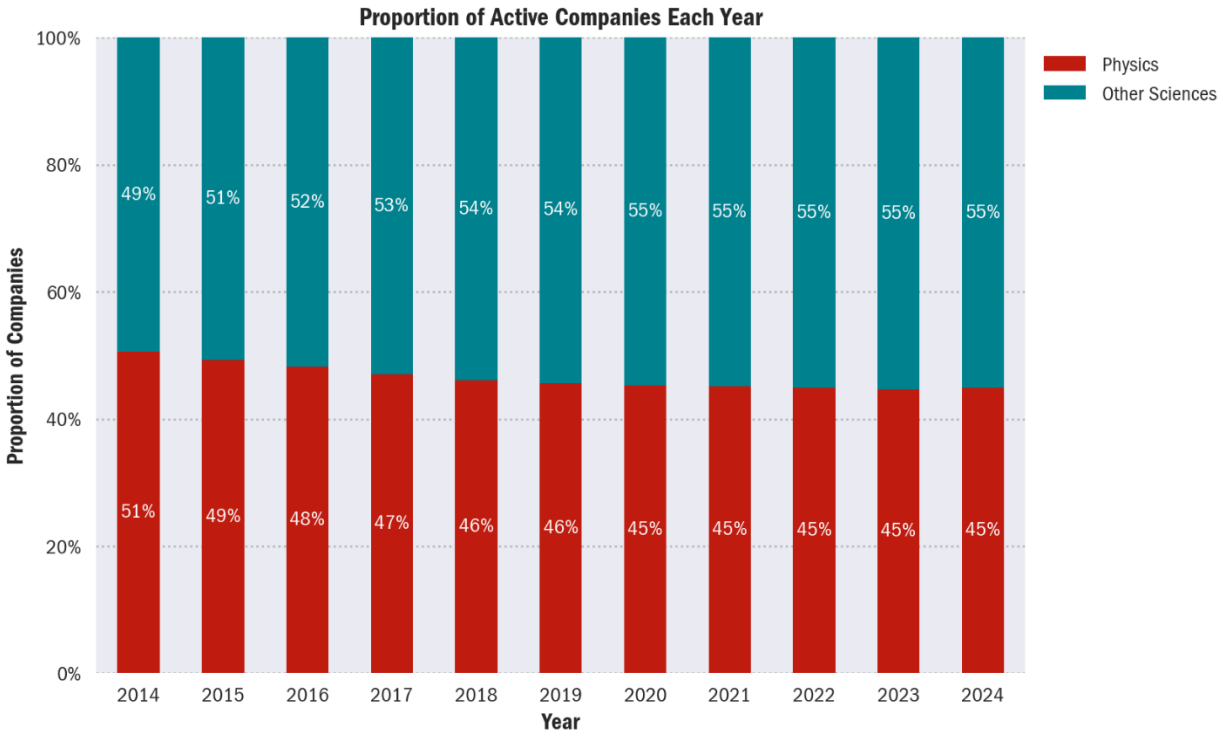
[Figure A7: Distribution of Physics Only estimated future funding uplifts under an even-footing scenario, generated through 10,000 simulated reconstructions of alternative physics definitions.]

Figure A8: Distribution of Simulated Sole Investor Proportions



[Figure A8: Distributions of Physics Only, Physics & Other Sciences, and Other Sciences proportion of investors' deals as sole investor between 2010-2024, generated through 10,000 simulated reconstructions of alternative physics definitions.]

Figure A9: Proportion of Active Companies



[Figure A9: Proportion of active companies in each year. Companies are allocated a 'physics proportion' based on the fraction of their industries tagged to the physics category. This plot details the sum of this proportion (and its complement, 'other sciences proportion') each year to show the relative proportion of science companies.]