

ESRC application and success rate data

This analysis accompanies the most recent release of ESRC success rate data:

<https://esrc.ukri.org/about-us/performance-information/application-and-award-data/> in May 2018. We are sharing it externally to invite comment, discussion and further analysis. Our aim is to use its conclusions to help us to work effectively with research organisations (ROs) on key issues such as success rates, demand management and research strategy.

Notes on the data and methods used are at the end of the document. These explain the choices made in the selection and analysis of the data, and also some of the uncertainties associated with it.

Key findings.....	2
Demand and success rate trends.....	3
Organisational success rates.....	7
Success rates by discipline.....	9
Conclusion.....	10
Notes on the data.....	11
Annex – funnel plots.....	12

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Key findings

- ESRC grant decision volumes dropped substantially between 2016-17 and 2017-18, with fewer than 1000 funding decisions being made last year.
- A general increase in the average grant size and a continued increase in the proportion of decisions that related to the 'Open Call' meant that, despite the reduced volume of proposals, there was only a small increase in the overall ESRC success rate, which was 26% by number.
- There continues to be a positive association between decision volume and success rate for applicant organisations but not for disciplines.
- Few research organisations have notably high success rates, and none has a particularly low rate. This is especially true for responsive funding, where no one stands out.
- The median ESRC grant size in 2017-18 was more than three times the median ESRC grant size in 2011-12, even adjusting for inflation.

Demand and success rate trends

Figure 1 shows the total number of decisions made by ESRC, and the associated success rates, in financial years 2011-12 to 2017-18:

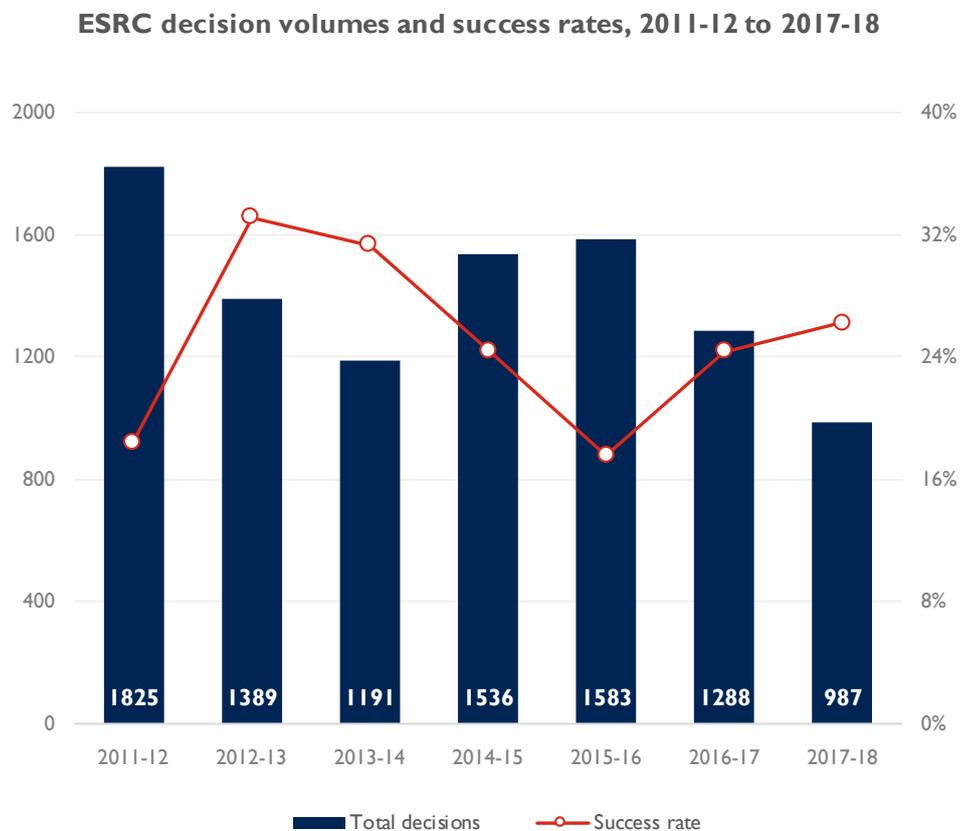


Figure 1: ESRC decision volumes (blue bars, left axis) and success rates (red line, right axis) in financial years 2011-12 to 2017-18. Number of decisions in-year shown at base of bar.

ESRC made fewer grant funding decisions in 2017-18 than in any of the preceding six years. With a relatively static budget the net effect was to increase success rates in 2017-18 to 26% from 24% in 2016-17.

Figure 2 applies the same analysis to the 'Research Grants (open call)', our main responsive mode scheme:

Open Call decision volumes and success rates, 2011-12 to 2017-18

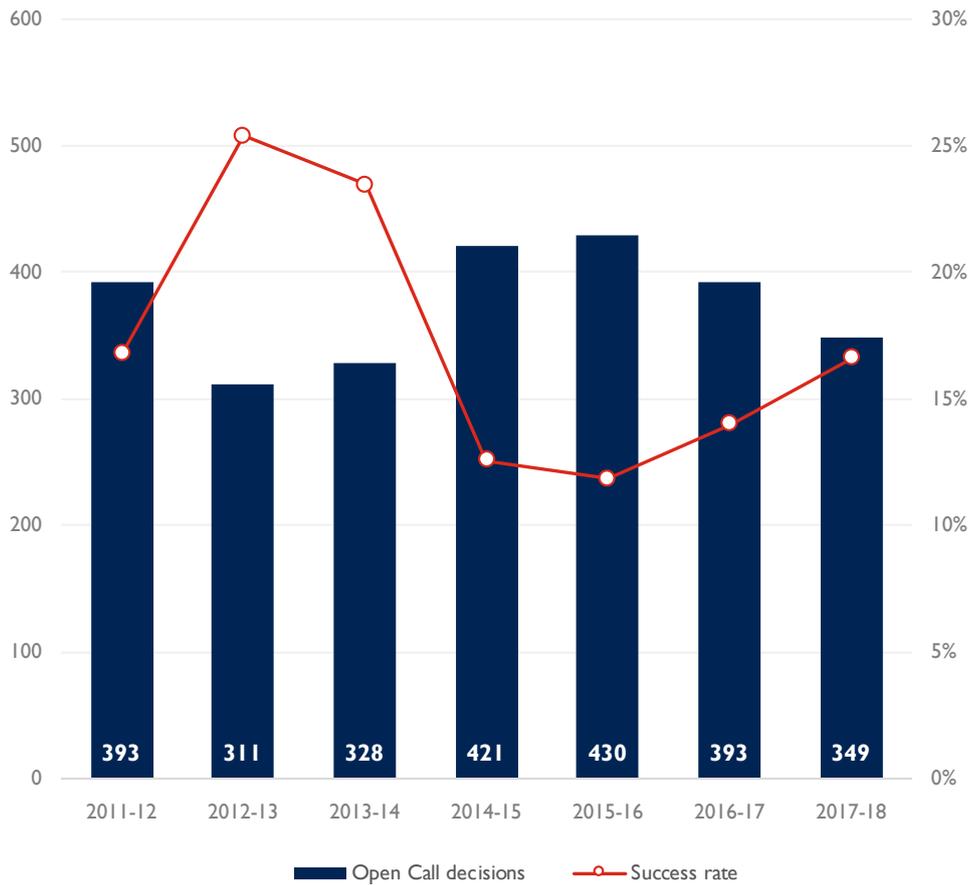


Figure 2: Open Call decision volumes (blue bars, left axis) and success rates (red line, right axis) in financial years 2011-12 to 2017-18. Number of decisions in-year shown at base of bar.

Decision volumes for the Open Call are relatively stable. The same is true of the scheme's recent success rate, which has varied between 12% and 17% in the last four years. The sudden decrease in rates after 2013-14 is associated with a change in the scheme's funding limit.

So despite a drop in decision volumes of 23% between 2016-17 and 2017-18, success rates rose by only 2%. This implies a disconnect between decision volume and success rate, or at least an underlying complication that means that lower demand does not automatically lead to higher success rates. What is the cause?

The proportion of all ESRC funding decisions made that relates to the Open Call has increased in the seven years covered by the data, from just over 20% in 2011-12 to 35% in 2017-18 (Figure 3):

The Open Call accounts for an increasing proportion of ESRC funding decisions

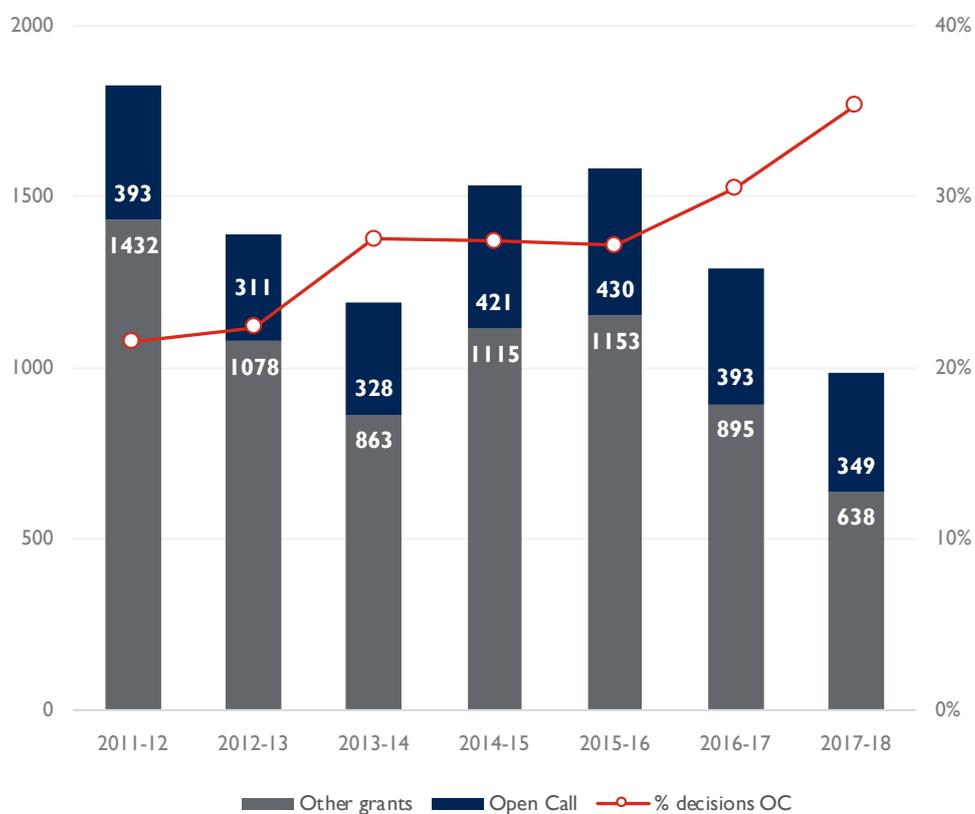


Figure 3: decision volumes for the Open Call (left axis, blue bars) and all other schemes combined (grey bars, left axis) and proportion of decisions relating to the Open Call (red line, right axis) in financial years 2011-12 to 2017-18. Number of decisions in-year shown inside bars.

An increasing proportion of the proposals submitted is submitted in response to the Open Call and, as shown in Figure 4, Open Call grants are larger than average. And in general grants are getting larger:

Median grant sizes continue to increase

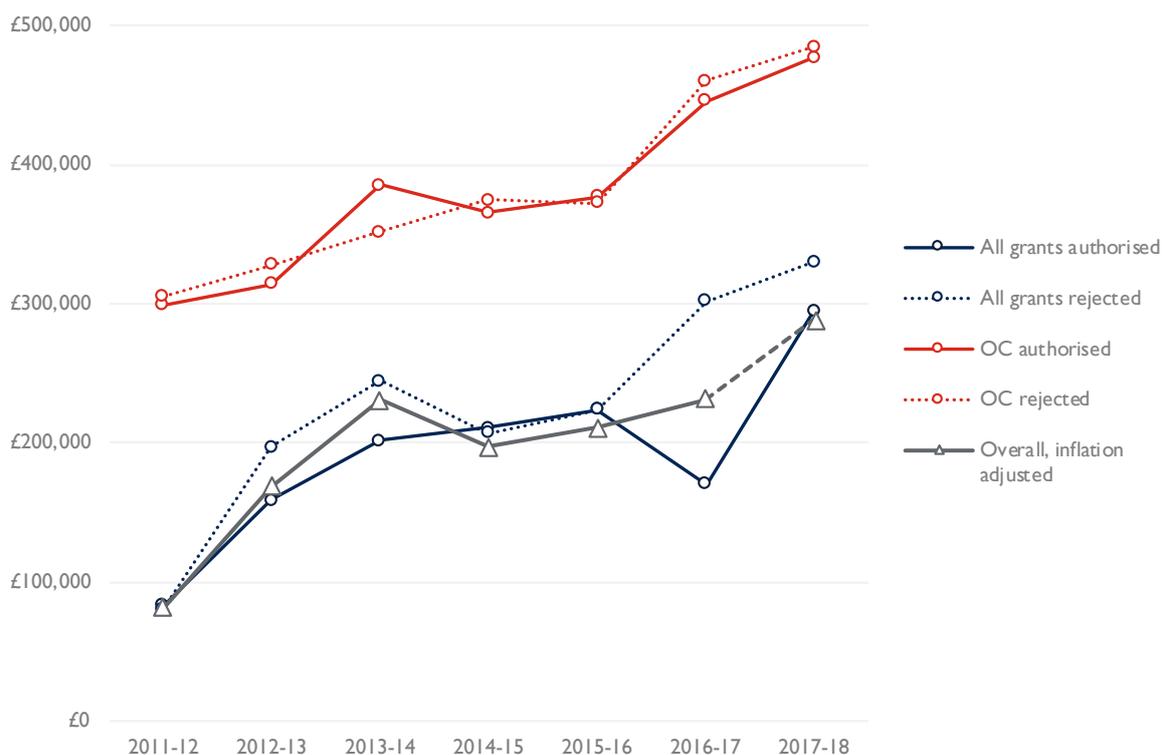


Figure 4: median grant values for authorised (solid lines) and rejected (dotted lines) grant applications for the Open Call (red) and all grants (blue) in financial years 2011-12 to 2017-18. Overall inflation adjusted median grant size shown in grey, (2017-18 figure estimated.)

The average ESRC proposal requested £320,000 in 2017-18, up substantially from £81,000 in 2011-12¹. When the effects of inflation are accounted for² median grant sizes have increased by £25,000 per year on average in each of the last seven years. Open Call grants have increased in size by 50% over the same period, with about half that increase attributable to changes to the scheme limits and half being the result of broader inflation.

With a relatively static budget, general cost inflation and a greater proportion of grants submitted to the Open Call it is no surprise that success rates do not respond as strongly to decreases in decision volume as might be expected.

Funded grants tend to be smaller than unfunded proposals, but this is unlikely to be a direct effect of size as no consistent pattern is apparent when looking at the Open Call only. It is more likely that the difference is the result of the specific characteristics of different schemes and calls for proposals, although influenced to an increasing extent by the Open Call's characteristics as that scheme comprises an ever-larger fraction of ESRC business.

¹ Several calls and schemes for small grants were closed after 2011-12, implying that at least some of the overall increase in grant size has been policy-driven.

² Based on HM Treasury GDP deflators.

Organisational success rates

Figure 5 shows the relationship between institutional success rates and decision volume over the period 2015-16 to 2017-18.

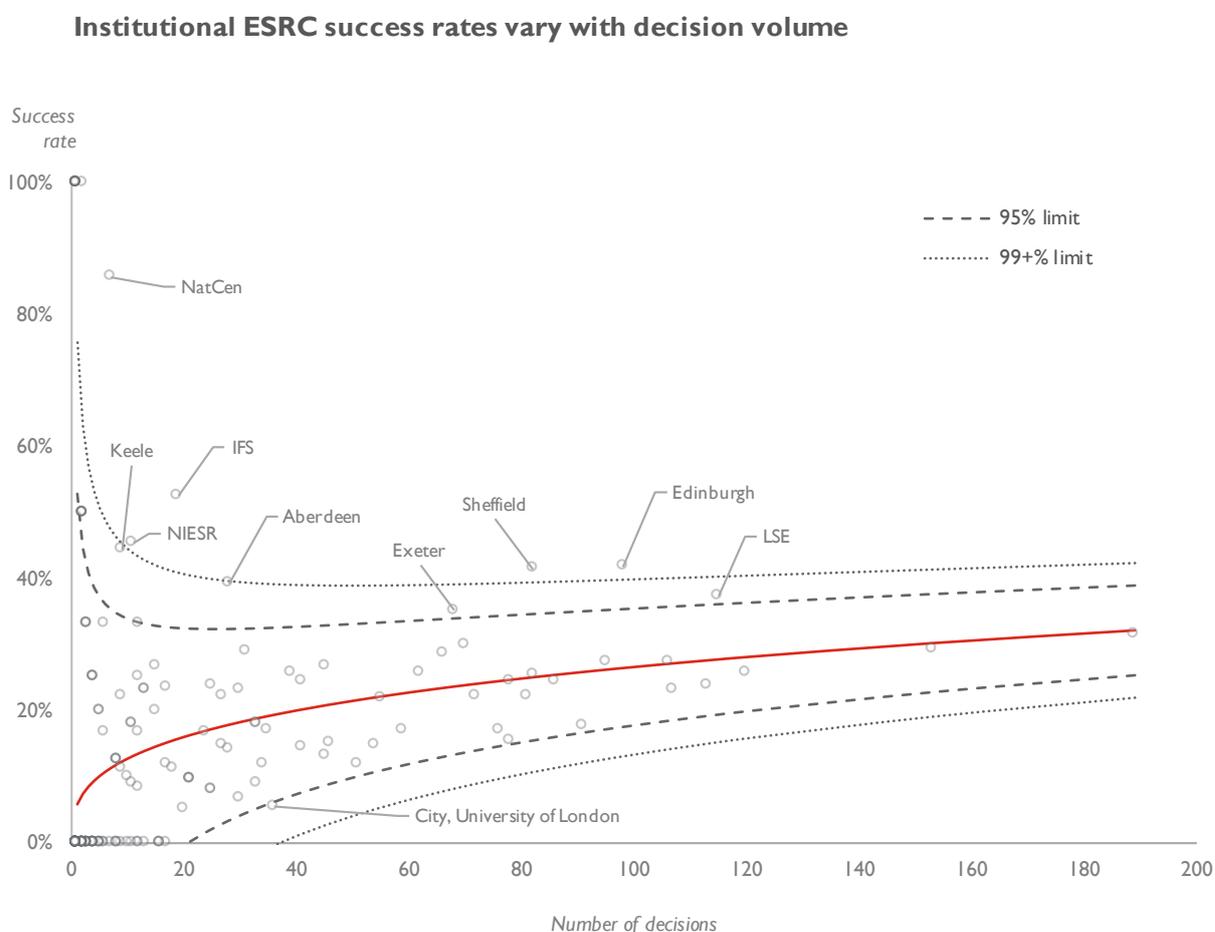


Figure 5: funnel plot of institutional success rates for ESRC funding decisions made across financial years 2015-16 to 2017-18. Total number of ROs represented on the chart is 230. Predicted success rate shown in red, with 95% (dashed) and 99+% (dotted) control limits shown. See annex for further details.

As found in previous years, there is a positive association between decision volume and success rates. The direction and nature of causality is not known.

After adjusting for the decision volume effect it appears that no ROs have notably low success rates, with the possible exception of City, University of London. Four ROs have success rates which are much higher than those we might expect to see based on their decision volumes: Edinburgh, IFS, NatCen and Sheffield. Aberdeen, Keele and NIESR might also have high rates. Of the other most frequent applicant ROs, only LSE and Exeter might have experienced notable success in the last three years, but this is not clear-cut.

When focusing on the Open Call only, a similar pattern emerges (Figure 6):

Open Call success rates 2015-16 to 2017-18

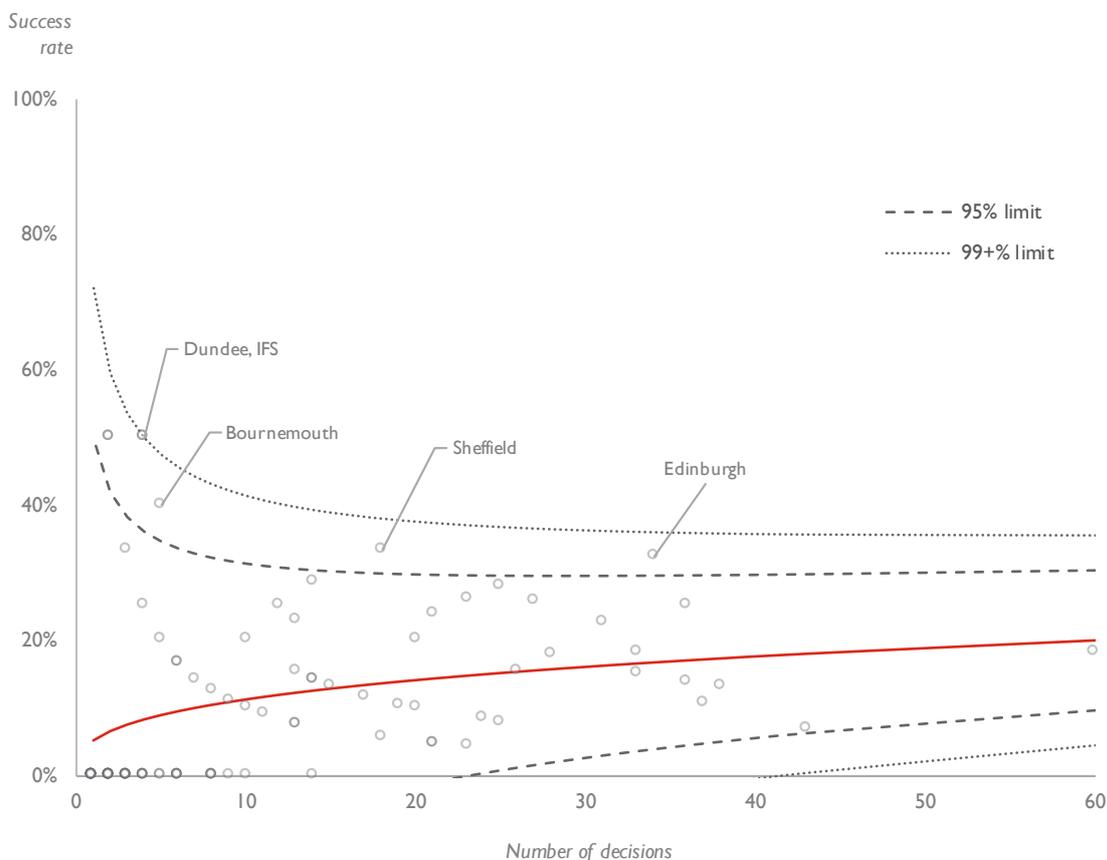


Figure 6: funnel plot of institutional success rates for ESRC funding decisions made in the Open Call across financial years 2015-16 to 2017-18. Total number of ROs represented on the chart is 112. Predicted rate shown in red, with 95% (dashed) and 99+% (dotted) control limits shown.

With fewer decisions made in the period a more extreme result would be required to identify abnormal outcomes, and indeed we see much less unexplained variability in this more limited data set. While the association between decision volume and success rate is still present, it is less certain that any RO's success rate differs significantly from expectations³.

³ With just over 100 ROs in the data we would expect to see around five points outside the 95% limit even if everyone was performing normally, and this is just what we find.

Success rates by discipline

Figure 7 shows success rate by decision volume for the 19 core disciplines used to classify ESRC grant applications⁴:

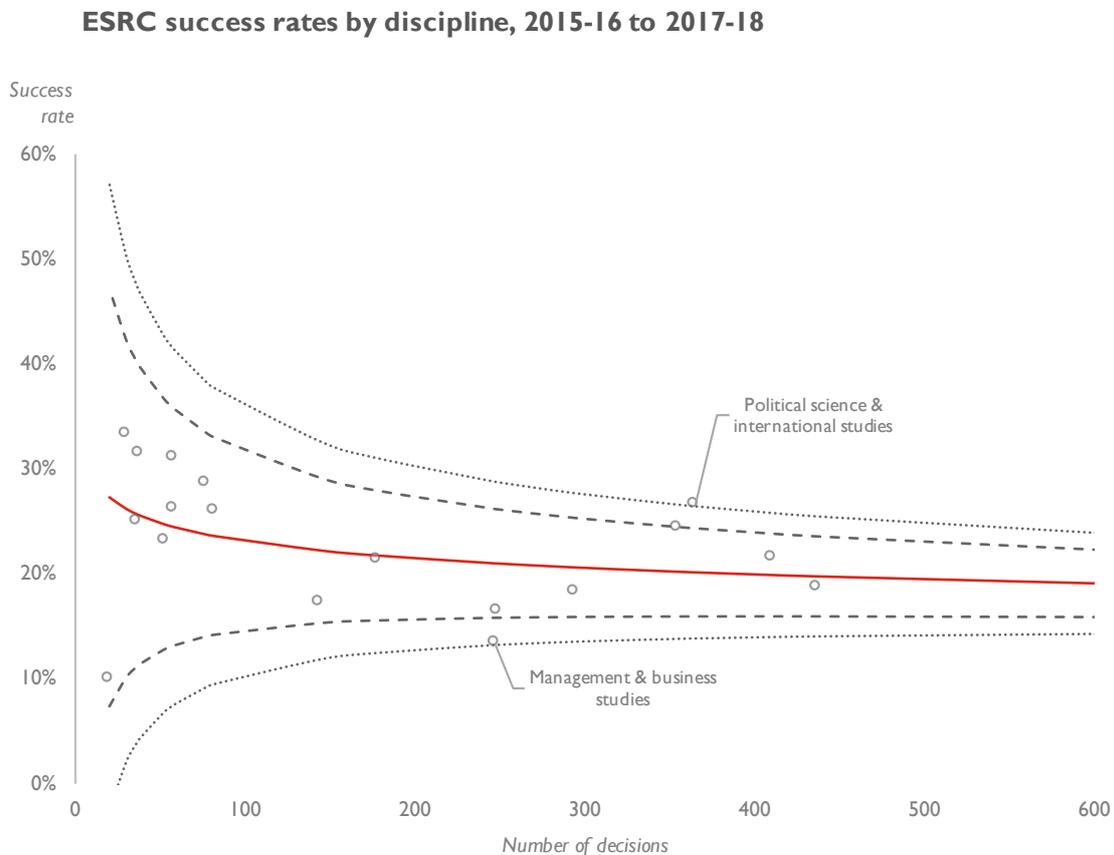


Figure 7: funnel plot of disciplinary success rates for ESRC funding decisions across financial years 2015-16 to 2017-18. Predicted rate shown in red, with 95% (dashed) and 99+% (dotted) control limits shown.

There is probably no consistent association between decision volume and success rate for disciplines. Applicant communities applying more frequently do not have a greater overall chance of securing funding.

On balance it seems reasonable to conclude that 'Political science & international studies' had an unusually high success rate in this period, while 'Management & business studies' had a low rate. No other disciplines had notably high or low success rates.

⁴ These are: Area Studies; Demography; Development studies; Economics; Education; Environmental planning; History; Human Geography; Law & legal studies; Linguistics; Management & business studies; Political science & international Studies; Psychology; Science and Technology Studies; Social anthropology; Social policy; Social work; Sociology; Tools, technologies & methods.

Conclusion

In terms of grant decision volume, 2017-18 was the quietest year that ESRC has had in recent times. And it's no surprise that, as success rates and demand are inversely related for a given funding volume, the success rate was higher than that in 2016-17. What is surprising is just how small the increase was. A near 25% reduction in decision volume translated into a success rate increase of 2%.

The immediate causes of the disconnect between decision volume and success rates are clear: in general grants are getting bigger, and an increasing proportion of grants is going through the Open Call, which is itself a scheme which attracts larger grants. This may have soaked up much of the money which otherwise might have been released by the lower volume of proposals received.

More than that probably can't usefully be said. To be reliable, a year-on-year comparison needs all other things to be equal, but they never are. The only constant factor is change. With all this going on it's not surprising that there are few examples of unusual performance in the system. As is often found with the research councils in UK Research and Innovation (UKRI), for ESRC there is a positive association between volume and success. Once that's accounted for it's unusual for any organisation to make itself stand out.

But on the positive side it seems that there are no under-performers. Though many organisations will experience bad periods from time to time, in general there is little that can or should be done in response to them, other than learning from mistakes and not repeating them. The same is probably true for individual disciplines, though these are subject to the effects of strategy more directly and so their performance can less readily be ascribed to 'natural variability'.

Unless the decision volumes seen in 2017-18 are a sign of a sustained change in behaviour, we might well expect to see a decrease in reported success rates in 2018-19 as grant inflation overtakes demand reduction. This is of course not inevitable. A success rate represents the ratio of supply to demand and, with current reporting practice and even with diminishing supply, at the end of a year you can have any success rate you like, as required and from 1% to 100% inclusive.

This might sound odd, but it is true. Among others, the extent of use of processes based on outlines, application of demand management measures of various kinds and algorithmic funding all shape and determine success rates, turning them from a measure of system-wide performance into a measure of something else (and it's interesting to think about what exactly it is that they are measuring.)

That's not to ignore or understate the importance of the question of the effort that goes into unfunded proposals, which is a key issue. But success rates themselves are a poor measure of that, and they are not in themselves the point of what we do. Success rates are not a measure of funding success, for research councils or anyone else.

Notes on the data

While we have taken care to ensure that the data are as complete and accurate as they can be, like many data sets they are best thought of as approximating reality rather than describing it precisely. In particular it is worth remembering that the process of creating these success rate data rests on a specific set of assumptions about what data to include, time windows for reporting and other (frankly somewhat arcane) decisions which reflect the internal workings of the current UKRI grants system. In light of this, reported success rates should be viewed as being within around one to two % of the 'actual' figure. Grant volume data are similarly likely to be accurate to $\pm 1\%$, or within around 10 to 20 grants of the true total count in each year.

Data are reported in relation to decisions made in financial years (the period 1 April to 31 March) 2011-12 to 2017-18. To be included grants need to be either 'Authorised', meaning that a grant offer has been made, or 'Rejected', meaning that a proposal has been received and assessed and a decision not to fund has been made. Only research grant and Fellowship data are included. Training, impact and other grant types are in general excluded, though some grants with these aims may be found in the data as the categories are often not mutually exclusive.

Success rates by both number and value are reported in the accompanying data, which can be downloaded from the ESRC website: <https://esrc.ukri.org/about-us/performance-information/application-and-award-data/>

The success rate is the ratio of the number or value of grants whose decision is 'Authorised' to the total number/value of grants on which a decision has been made. In general, success rates by number are lower than those by value, as the latter are often skewed by the award of a small number of sometimes extremely large grants in each year. This analysis reports on success rates by number as they approximate the experience of the applicant community, and the fate of 'the average proposal', better than do figures by value. Analyses tend to lead to the same conclusions whether by number or value.

We are including separate results for both the full set of grants and the ESRC's 'Research Grants (open call)', which is at the heart of our responsive mode processes. The extra complexity in presentation is justified as responsive mode funding is known to be very important to researchers.

Grant proposals are classified by the applicant submitting them, using one or more disciplines, although discipline classifications are on occasion modified after receipt. For analyses based on disciplines we have used only the primary discipline classification to describe each grant. The actual picture is of course nothing like as black-and-white as the analysis suggests and in fact 70% of the grants ESRC funds cannot be described with reference to just one discipline⁵.

⁵ See <https://esrc.ukri.org/files/about-us/performance-information/multidisciplinarity-on-esrc-grants/>

Annex – funnel plots

Funnel plots allow the comparison of RO success rates without implying a ranking.

They indicate an average success rate and, centred on this, a range of success rates (the space within the funnel) which is compatible with a belief that observed deviations from the average are best understood as being down to nothing more than chance variability.

If all ROs were to have the specified underlying chance of each of their applications being funded, their outcomes would tend to fall within the funnel with a probability approximated by the control limit given. There is little to be gained by trying to establish reasons for apparent under- or over-performance of any ROs whose data points fall within the funnel.

Where an RO's data point falls outside the funnel there may be some justification for believing that particular RO was displaying atypical behaviour. ROs falling outside the limits *might* have success rates which differ from the average in a way that is incompatible with chance variation, and this *may* justify further analysis or action.

It is sensible to approach these plots with some caution. As the number of data points increases, the number of points that fall outside the funnel can be expected to increase even if each RO does in fact have the expected success rate. It is not safe to conclude automatically that 'outside the funnel = unusual'.

That said, success rates which are consistently above or below the average, but which never actually fall outside the funnel limits, may still be a sign of abnormal variation and this pattern too may indicate unusual behaviour.

The funnel plots in this analysis are based on a calculated volume-dependent success rate, rather than the more traditional uniform rate. The underlying relationship between volume and success is⁶:

$$\text{Predicted success rate} = 1 - e^{-an^{(b-1)}}$$

which as required is bounded by 1 and 0 and takes the value 0 when n is 0. When $b > 1$, volumes and success are positively associated; when $b < 1$ they are negatively associated. When $b = 1$, $n^{(b-1)} = 1$, there is no success-volume relationship and so the more usual symmetrical funnel is produced. Values of a and b used to test for this were derived from non-linear least squares optimisation of the above relationship, using the 'nls' function in R, weighted by decision volume. Where a claim for an association between volume and success is made in the text it is based on a p value of less than .05 for the null hypothesis that $b = 1$, and so is in those terms 'statistically significant' (though of course b is never exactly equal to 1: there is always a success-volume relationship, but it may not be a stable one.)

⁶ See <https://esrc.ukri.org/files/about-us/performance-information/the-relationship-between-decision-volume-and-success-rates/> for more details. The choice of base is arbitrary.