

Pro Bono Economics

Blue Sky

Estimating the benefits of Blue Sky's employment programme.

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1. Introduction

Putting financial values of the work of charities always presents challenges, though funders often want to have a sense of the value for money in an activity. One way of expressing the value of Blue Sky's work with ex-offenders is to estimate its financial value to third parties, such as national and local government agencies. Of course to emphasise the cost savings and income improvements might be thought of as reducing the multi-dimensional benefits to a single money metric. However, as long as we recognise that costing many of the benefits, to self-esteem and morale for instance, is beyond most cost-benefit studies, it is of real service to estimate the values of the quantifiable benefits of the work. This is especially of those benefits that accrue to agencies that might develop working relationships with Blue Sky. We simply need to keep in mind that these are lower bounds for the benefits. A full study would develop a cost-benefit analysis, but we will stop short of that and concentrate on these third party benefits.

We are fortunate to be able to draw on three existing studies and bring them all to bear on the question. The first study is the Ministry of Justice's Justice Data Lab (JDL) Report on Blue Sky (Ministry of Justice, 2015). We outline the key elements of this study below, but it yields us a critical input of the best available estimates of the extent to which re-offending is reduced among Blue Sky ex-offenders compared to others. As we will see, the financial benefits to lower re-offending are the largest part of the estimated financial benefits of Blue Sky. Two other studies calculate different elements of the financial benefits. The Deloitte Tool (Blue Sky, 2016) is a spreadsheet-based benefit calculator that allows the calculation of

the financial benefits related to: reduced offending, in terms of lower court and prison costs, reduced unemployment (in terms of reduced benefit dependence and increased tax payments) and reduced substance abuse (and thus reduced health expenditure). We explain and then exploit this tool below. The final study is the recently published economic assessment of the impact of the work of the Prisoners' Educational Trust by Oxley and Ferguson (2016) for Pro Bono Economics. This study estimates a rather different set of benefits from reduced offending. While the Deloitte tool includes legal costs and the costs of keeping a prisoner, the Oxley/Ferguson report concentrates on a more detailed assessment of the wider costs of crime: the total costs to victims and to the offenders' families for a range of different crimes.

In the follow sections we outline what we think are the main elements of each study, and take from each the key messages on costs, limitations of the work and so on. Then we turn to constructing some composite numbers, combining the three studies to arrive and range of estimates for the value of Blue Sky's work.

The key findings are that the current best estimate of the impact on the public purse of Blue Sky's activities in terms of reduced re-offending, lower unemployment and reduced substance abuse is about £18,600 for each ex-offender who completes the Blue Sky programme. We also explain how sensitive this number is to the estimates provided by the Justice Data Lab and those embedded in the Deloitte tool. It is our view that it would be worth further investigating the legal and other costs of offences that drive this result, as well as further investigating the reduction in re-offending.

2. The Ministry of Justice's Justice Data Lab Reoffending Analysis: Blue Sky

This study took the Blue Sky records of just over 300 ex-offenders and matched almost all of them to their records on the Police National Computer. The aim of the exercise was to compare the one-year re-offending rate of the Blue Sky ex-offenders with that of a control group taken from the Police National Computer. Note the standard Blue Sky programme of employment lasts six months. In order to try to reduce the impact of factors other than working with Blue Sky the JDL study was confined to a small group of 79 Blue Sky clients. First to those receiving community service or custodial sentences, rather than fines.

Secondly to include only those who had spent at least six months and no more than a year since leaving custody before starting with Blue Sky. This is quite a severe restriction. To understand it, see that it eliminates high-frequency re-offenders, i.e. those who do not last six months between custody and next conviction from the control group, so as not to exaggerate the impact of Blue Sky. It also sets the timing of the one-year re-offending rate at or near the end of the Blue Sky employment spell and this maximises the chances of capturing the Blue Sky 'effect'. The elimination of those with more than one year between custody and starting with Blue Sky follows as a consequence of the choice of the one-year reoffending rate.

Over 200,000 non-Blue Sky ex-offenders were matched as a control group with the 79 Blue Sky sample. In Annex Table 1, below, of the JDL Report (Ministry of Justice, 2015) we see the JDL control group were highly similar on average to the 79 Blue Sky ex-offenders in terms of the distributions by: ethnicity, nationality, gender, age, types of offences, length of sentence, criminal history and employment history. Of course, as the JDL website admits, it cannot control for those unmeasured characteristics that might raise the propensity to join Blue Sky and reduce the re-offending likelihood. In other words, the statistical problem associated with non-experimental data: the selection effect is with us here: see our Appendix, below, for a discussion.

The average one-year re-offending rates were 31% for the Blue Sky sample and 43% for the control group. This 12-point gap is large and important. However, JDL's strategy of restricting the sample, though good for doing their best to isolate the impact of Blue Sky from other influences, comes at the price of widening the 95% confidence interval to range from 1 to 23 percentage points. We show below how critical this gap, in re-offending between Blue Sky and non-Blue Sky ex-offenders is for estimating benefits. This is because the costs of an offence are very large indeed.

It should be noted that this finding is based upon Blue Sky ex-offenders in the early years of Blue Sky's operation. Our own preliminary work on job finding and reoffending finds that among a much larger group of Blue Sky ex-offenders, including post-2010 clients, the more recent clients had more success in avoiding re-offending, see Annex Table A1.

We take away from this that it would be best to evaluate the impact of Blue Sky activities with an estimate of 12% for the re-offending reduction, though it might be useful also to create reasonable upper and lower bounds by calculating with 6% and 18% reductions in re-offending.

3. The Blue Sky/Deloitte Tool.

The aim of this excellent piece of software is to allow the estimation of the savings made to the public purse by Blue Sky's work. It consists of a set of linked spreadsheets containing: estimates of the legal and custodial costs of an offender, the benefit and training costs and tax revenue losses of an unemployed person, the health care costs of substance abuse, and space for the inclusion of the savings due to job training undertaken by Blue Sky and the and public sector costs of homelessness. Since the tool currently does not contain estimates of the costs of homelessness or costings for job training benefits, we will leave these to one side as well. For prison costs they employ Ministry of Justice estimates of the costs of keeping an offender in prison for a year and then weight these costs by the sentence lengths of Blue Sky employees. This calculation becomes the annualised cost of keeping a Blue Sky offender in prison. When applied to the calculation of savings, it assumes that the re-offenders are typical of all Blue Sky employees in terms of prison sentences served and that those who re-offend will face similar sentences to those they had been given in the past.

Criminal justice costs are estimated from Home Office and Social Exclusion Unit information and assume a convictions to offences ratio of 20%. This is a key assumption as we will show below, as it raises costs by a factor of 5. Other non-criminal justice costs associated with offences, such as hospital costs of victims and damage to property and taken from Social Exclusion Unit documentation, but derive ultimately from estimates in the 2000 Government Spending Review and are inflated to 2015/16 prices, as are all the estimates.

On employment and unemployment rates, comparisons are presented of the unemployment rates among Blue Sky and non- Blue Sky ex-offenders. These data give a Blue Sky unemployment rate of 42% compared to 48% for ex-offenders in general. Net

savings are calculated by adding the reduction in Job Seekers Allowances and the increase in Income Tax and National Insurance contributions net of tax credits payable, taking into account the household circumstances of Blue Sky offenders.

On substance abuse the approach is to assume the reduction from 33% on entry to 17% at the end of a Blue Sky spell in reported substance abuse is due to the effect of the Blue Sky employment. These percentages are taken from Blue Sky’s full record to end 2015. The 19 point reduction given in Table 1 is estimated on the earlier data provided to JDL. Data of the saving to the NHS and elsewhere are taken from a number of sources.

The key results of all these calculations are given in Table 1. The tool, which is easy to use and well-designed gives a wealth of extra information about which parts of Government benefit the most. To summarise, the expected total saving per Blue Sky employee who completes the programme is calculated to be around £18,600.¹ Here we can see the sensitivity of this estimate to the assumed reoffending rate. Every 1 percentage point reduction in the reoffending rate would raise this estimate by £1,508.

Table 1 Blue Sky-Deloitte tool: Key cost estimates (at 2015/16 prices) and behavioural estimates

Estimated JDL reduction in re-offending	12 percentage points
Cost per prisoner weighted by sentence length, £	19,875
Legal costs per offences, £	88221
Non-criminal justice costs per offence, £	42,71
total	150,806
Estimated reduction in unemployment rate	6 percentage points
Reduction in income support per unemployed worker (see discussion), £	3474
Estimated reduction in substance abuse	19 percentage points
Estimated saving per person who ends their substance abuse, £	1675

¹ From Table 1. Calculated as $0.12 * \pounds 150,806 + 0.06 * \pounds 3474 + 0.19 * \pounds 1675 = \pounds 18097 + \pounds 208 + \pounds 318 = \pounds 18620$.

4. The Oxley and Ferguson Report for Pro Bono Economics on Prisoner's Education Trust.

This report, by fellow Pro Bono economists is certainly worth reading in its entirety, but for current purposes we want to concentrate on two aspects. The first is a set of interesting findings that probably tell us something about the magnitude of the selection effect. The second is their treatment of the wider costs of crime. This differs in some ways from the way these are treated in the Blue Sky/Deloitte tool. We take these issues in turn.

An important finding taken from the Justice Data Lab's analysis of Prisoner's Education Trust (PET) data derives from the operation of their educational grant awarding system. Offenders have to apply to be awarded grants to take PET courses and not all receive an award. Some are refused as they are too close to their release date (and presumably would not be able to complete the course) and some others are refused for other reasons. JDL had information on all three groups: those awarded grants, those refused for being out of time and the other refused offenders. When compared to matched non-applicants, all three groups had a mean one-year reoffending rate of around 7 percentage points lower than matched non-participants. When those awarded were matched to those refused, the gap is either less well-defined or statistically insignificant. This leads Oxley and Ferguson to speculate whether a selection effect is at work, so that those who would like to take education but are refused grant are more-or-less as likely to re-offend as those who took a course. This cautions us about the size of the selection effect. It could be large, at least, it could be large for PET courses. The Blue Sky employment scheme for ex-offenders requires a great deal more time and commitment from the ex-offenders and is a much more direct attack upon the real barriers to gaining work that ex-offenders face.

Table 2: Selection of Oxley and Ferguson’s average costs of a crime

Offence	2015 £ cost per offence
Homicide	1,985,289
Serious wounding	28,802
Sexual offences	10,952
Common assault	1,958
Robbery-personal	9,856
Theft of a vehicle	5,560
Criminal Damage (personal)	1,178
Burglary in a dwelling	4,391
Shoplifting	139

Source: Oxley and Ferguson (2016) Table 5 page 23.

The other innovation in the Oxley/Ferguson report is the great attention they pay to a number of studies that attempt to put values on the costs to victims of crime, producing a much richer array of values for the legal and non-criminal justice costs of an offence (see Table 1). In Table 2 we give some of Oxley and Ferguson’s best average (legal and non-criminal justice costs of offences).

The main point to take from this table is that the legal and non-criminal justice costs are estimated much lower than those calculated by the Deloitte/Blue Sky, if one takes into account that homicide is a tiny proportion of offences. However, recall that the Deloitte tool scales up these costs by a factor of five, by assuming an offence to conviction ratio of five.

5. Conclusions

From the Blue Sky/ Deloitte study the headline figure is £18,600 of savings to government and public bodies per Blue Sky ex-offender. This is a large sum. Most of the cost savings are in the legal and criminal justice cost savings, which are very high and driven in part by the offence to conviction ratio of five. So this estimate is sensitive to the accuracy of this ratio and it is also sensitive to the estimated reduction in the re-offending rate. These two aspects are those that leave us, as of now, with some reservations.

However, if one was to guess an annualised figure for the third party benefits from a substantial cut in re-offending and a significant rise in the employment rate, it would have to include the income tax gain to higher employment, the reduction in benefit payments and the legal costs of higher levels of criminal activity. These benefits seem very unlikely to be measurable in amounts less than tens of thousands per ex-offender.

References

Blue Sky (2016) 'The Economic Impact Assessment Model', April

Ministry of Justice (2015) 'Justice Data Lab Reoffending Analysis: Blue Sky', October(?)

Oxley, Paul and Helen Ferguson (2016) 'An Impact Assessment of Funding Educational Resources for Prisoners' Pro Bono Economics and Prisoners' Educational Trust, May.

ANNEX: Some background tables.

This annex contains tables generated from Blue Sky's database. We start with an overview of the progress of ex-offenders through the Blue Sky scheme. In Table A1 the ex-offenders are grouped by the number of weeks they spend with Blue Sky and by their immediate destination after Blue Sky. Note that many leave at around 26 weeks, of course, which is the normal Blue Sky spell length. What is immediately obvious is that the proportion who leave Blue Sky directly into work rises strongly as a spell proceeds towards 26 weeks and stays high thereafter. Correspondingly the number who leave to a spell of unemployment decreases. The rate of re-offending is low and falls rapidly through early weeks of the spell with Blue Sky. There are quite a lot of people whose status is unknown. A study of this group strongly suggests that they are not atypical. For instance, many of these people with unknown destinations stay with Blue Sky for long spells and many take training opportunities, so the balance between employment, unemployment and the other outcomes seems unlikely to be significantly swayed if we knew their outcomes.

Studies of other interventions, such as more general job training, or education outcomes, suggest that the employment rate rises somewhat over the months that follow the end of the intervention. The classic example is the employment rate of graduates, which rises through the autumn of the graduation year. It would be really useful to see if this general tendency also holds for Blue Sky clients.

Table A1: Destinations by duration of stay with Blue Sky

Weeks with Blue Sky:	All leavers	Employed	Unemployed	Re-offend / Prison	Inactive	Unknown
1-2	97	12	64	9	2	10
3-5	99	23	47	10	0	19
6-8	92	18	55	5	3	11
9-11	87	16	48	3	2	18
12-15	88	29	35	5	2	17
16-19	83	23	33	4	3	20
20-25	85	34	29	4	1	17
26	82	45	24	4	4	5
27-30	86	42	30	3	1	10
31-38	80	40	26	3	1	10
39+	92	53	22	3	0	19
<i>All</i>	<i>976</i>	<i>335</i>	<i>413</i>	<i>53</i>	<i>19</i>	<i>156</i>

Notes: Each cell counts the number of people who left Blue Sky, by the number of weeks they stayed. So, of the 82 people leaving Blue Sky at 26 weeks, 45 had jobs, 24 were registered looking for work and 13 were inactive, unaccounted for, re-offending, or in prison. Note that we count as employed those who leave to full-time and part-time work, as well as those who go on to education.

In Table A2, in order to see these trends more clearly, we omit those ex-offenders whose end-of Blue Sky status is unknown, and then report the proportions of the others, who are employed etc.

Table A2: Percentages of those whose destinations are known, by destination and by duration

Weeks with Blue Sky:	% in Employment	% Unemployed	% Prison/re-offending
1-2	13.8	73.6	10.3
3-5	28.8	58.8	12.5
6-8	22.2	67.9	6.2
9-11	23.2	69.6	4.3
12-15	40.8	49.3	7.0
16-19	36.5	52.4	6.3
20-25	50.0	42.6	5.9
26	58.4	31.2	5.2
27-30	55.3	39.6	3.9
31-38	57.1	37.1	4.3
39+	67.9	28.2	3.8
<i>ALL</i>	<i>40.9</i>	<i>50.4</i>	<i>6.5</i>

From Table A2, it is even clearer that the proportion of leavers who go into employment rises strongly after 11 weeks and again at the standard completion period of 26 weeks. For those who stay 26 weeks or more, the employment rate is well over 50 percent. Reflecting that trend, the proportion leaving to unemployment is high for people who drop out of Blue Sky early, but it falls heavily with duration, again around the 12 weeks and 26 weeks marks. As already noted, the re-offending rate falls to a low level after 5 weeks with Blue Sky.

In Table A3 we report some characteristics of the Blue Sky ex-offenders. Looking over these characteristics, we see that those who leave to become unemployed are a little older than average and the re-offenders are younger than average. We also see that the unemployed tend to have more dependants. There is a marked difference between the employed and unemployed on the one hand and the inactive and re-offending groups on the other hand in terms of the likelihood of being with their family at the end of their Blue Sky spell. It is not clear as yet why this comes about but it may be that family break-up is highly correlated with unsuccessful post-Blue Sky outcomes. Another notable feature of the table is the

much heavier rate of substance abuse, both before and after Blue Sky, among re-offenders. Re-offenders also have had longer sentence lengths on average.

Table A3: Some average characteristics of Blue Sky clients, by status at the end.

	Employed	Unemployed	Inactive/unknown	Prison/re-offending
Age (years)	31.5	32.0	31.2	30.3
No. of Dependents	0.76	0.96	0.76	0.77
With family at Start (%)	92	92	89	85
With family at End (%)	90	90	69	79
On substances at start (%)	33	29	34	51
On substances at end (%)	19	14	19	40
Married (%)	7	6	4	2
Sentence length (months)	25.6	18.5	17.6	36.6
Under 30 years (%)	54	49	50	55
Over 50 years (%)	5	8	4	2

The classic problem with these kinds of statistics is that the reader is tempted to interpret them according to whatever theory of behaviour comes to mind. Critical for us is that they may or may not show the impact of Blue Sky's work. For example, many factors might be behind the positive correlation between length of stay with Blue Sky and employment rate at exit. Some of these, such as the ex-offenders age, housing situation, education, marital status, numbers of dependants, are factors we can control for. For instance, we can ask if the length of Blue Sky stay and all these factors jointly determine the employment outcome. We will turn to that next, but there are other factors, on which we do not have data: family background, experiences in prison etc., which might also influence the employment outcome, and if we do not have data on these, and some of them tend to coincide with the

factors we can control for, and the interpretation of our findings must be carefully spelled out.

But even if we do that, we are still a long way from being able to assert that we have captured the average impact of Blue Sky's work on employment. To see this, imagine the classic ideal test. We would take some ex-offenders at random and put some through Blue Sky and others not (the control group). After that we would look at the difference between those two groups in terms of employment outcomes. The power of that experiment turns on the random selection. If, say, by asking the ex-offenders if they wished to take part in the experiment, we removed that random assignment, then we could not be sure that any result was not due in part to the selection of willing participants. For Blue Sky, selection is inevitable: People who don't want to work will either refuse the offer or drop out early. It follows that comparisons with results of other attempts to help ex-offenders would help define the Blue Sky effect.

Having issued that caveat, Table A4 give the results of estimating the impacts of various characteristics on the chances of leaving Blue Sky to a job. This by no means the final word on this, so this table should be treated as experimental. It is estimated by a probit regression. The dependant variable (the phenomenon we are trying to explain) takes the value 1 for an ex-offender who finds work or and course of education and the value of zero otherwise. The 'otherwise' destinations are re-offending or unemployment. In the Table below a positive coefficient means this characteristic (say, being over thirty years old) is positively associated with getting a job, holding the other characteristics constant. Here is a summary of the results.

- First older workers seem to be mildly more likely to find a job, than younger ex-offenders.
- If the ex-offender has dependants, they are less likely to have left Blue Sky for a job.
- Being married has the opposite effect. So, combining these two results, a married person with dependants has about the same chance of finding work as an unmarried person with no dependants.
- If a person starts a spell at Blue Sky living with their family, but is no longer with the family at the point of departure, they are less likely to exit to employment.

- If a person is on substances at the end of Blue Sky spell, they are less likely to exit to employment.
- Controlling for all these effects we find two effects relating directly to Blue Sky. First, the observation that the employment outcome is more likely the longer the Blue Sky spell is still strongly present even with these other controls. As we observed earlier, that effect is strongest in the earlier weeks.
- Lastly we use a very crude initial way to control for training, which is simply an indicator for an ex-offender who has taken at least one training course. This has a strong positive effect on the chances of employment that is additional to the impact of the length of the spell with Blue Sky.

Table A4 Probit regression investigating the chances of leaving Blue Sky for a job, versus leaving into unemployment or re-offending, prison, or unknown outcomes.

<i>Explanatory variable</i>	<i>Coefficient</i>
Age<30	0.039*
Has dependants at start	-0.16***
Married at start	0.35*
Moves away from family	-0.43***
On substances at start	-0.08
On substance at end	-0.28*
Weeks with Blue Sky	0.031*
Weeks squared	-0.0002***
Took at least one training course	0.325***
Number of obs	953
LR chi2(13)	225.73
Prob > chi2	0.0000
Log likelihood	-502.55768
Pseudo R2	0.1834