



Introduction of insolvency risk services with  
Dun & Bradstreet

and

Consultation on changes to our  
insolvency scoring methodology from 2021/22

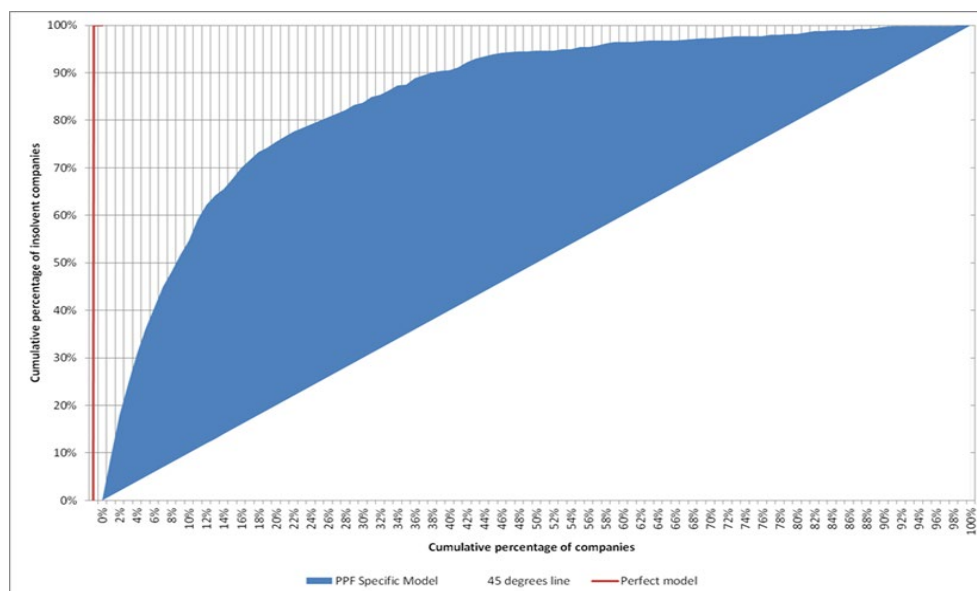
TECHNICAL APPENDICES

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## Appendix 1. What is the Gini coefficient?

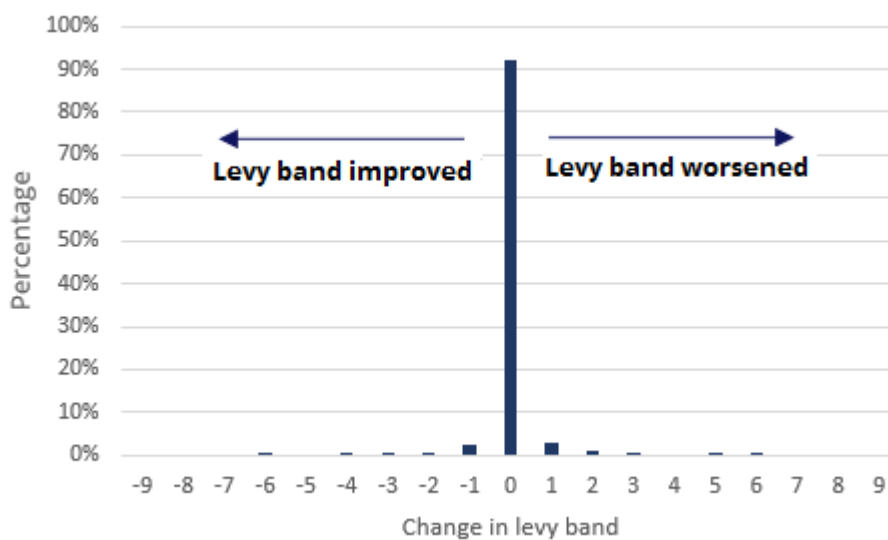
1. The Gini coefficient is an industry standard measure of the ability of credit scoring models to discriminate between risks.
2. The chart below (prepared for the second triennium consultation) plots the actual distribution of insolvency events in our experience against that predicted by the PPF-specific model (blue curve) at that time. It shows the proportion of insolvencies that are predicted by any given proportion of scores, starting from the worst score. Thus it shows that half of the employers that subsequently became insolvent were among the 8 per cent of employers with the lowest PPF-specific scores, and 80 per cent of insolvencies were in the lowest 25 per cent of scores.
3. A perfectly accurate model would have given the worst score to all employers that then became insolvent – we show this on the chart by the red line. At the other extreme, a model with no predictive power would place only 1 per cent of failures in the worst one per cent of scores, 10 per cent of failures in the bottom 10 per cent and so on - we show this by the diagonal line. The more predictive a model is, the closer its curve will be to the red line and the further it will be from the diagonal line (a model placing 60 per cent of failures in the bottom 20 per cent of scores is better than one placing only 40 per cent of failures in those scores).
4. We can also calculate a statistic, the Gini coefficient, to express the accuracy numerically. This simply measures how large the blue area, between the model's curve and the diagonal, is as a proportion of the area of the triangle between the perfect model and the diagonal. A Gini coefficient will, therefore, take a value between 0, reflecting no accuracy at all, and 1 for perfect accuracy, or of expressed as a percentage a value between 0 and 100 per cent.



## Appendix 2. The impact of differences in data collection methodology

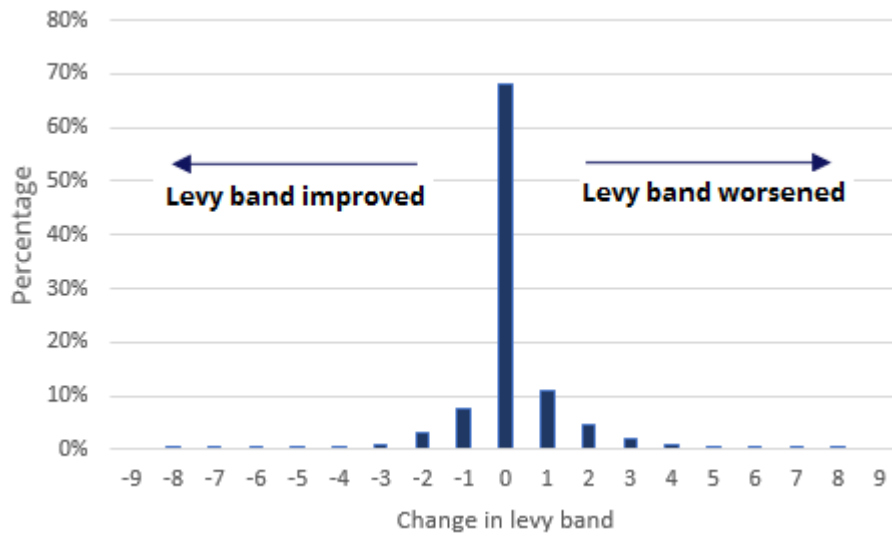
1. Differences in data collection methodology between Experian and D&B can have an impact on scores. Pictured below is a summary of the levy band movement resulting from differences in data collection other than differences in corporate linkages or the treatment of zeros and unknowns. For all employers included in the modelling data the replica model produces levy bands that are the same in the overwhelming majority of cases. Where there is a change in levy band there is a small bias towards more favourable levy bands (i.e. 1.7% of the population).

**Chart 3.1: Change in levy bands Replica Model – all employers included in modelling data**



2. Next we incorporate the impact from differences in data collection related to differences in corporate linkages or the treatment of zeros and unknowns. For all employers included in the modelling data this replica model produces levy bands that are the same in two thirds of cases. Where there is a change in levy band there is a bias towards more favourable levy bands (i.e. 6.8% of the population).

**Chart 3.2: Change in levy bands Replica Model - all employers included in modelling data**



## Appendix 3. Baseline and consultation model scorecards

### 1. Introduction

1.1. In this section we present for each scorecard discussed some key attributes considered as part of the modelling process.

- Fill Rate - Proportion of the population for which the variable would NOT be classed as 'unknown'. Unknown is defined as the raw data not being available for the variable in question.
- Weight - The weight represents the relative contribution that each variable brings to the model. The sum of weights across all variables adds up to 100%. The higher the weight the more important that variable is to the model
- Significance - The likelihood that there is a correlation with insolvency risk.<sup>1</sup>
- Impact - The correlation between movements in value of the variable and the risk of insolvency (e.g. + means that if the value of the variable increases, then the risk of insolvency will increase as well)

1.2. We also present for each scorecard discussed a so called "Lift Chart" to illustrate the performance of the model. The height of each column in the lift chart below represents the percentage of sponsors that have gone insolvent for a particular decile. The deciles are ranked from the most likely sponsor to become insolvent to the least likely sponsor to become insolvent. Each decile represents 10% of the sponsor population. When looking at a lift chart, one wishes to see a staircase effect, i.e. the bars to descend in order from left to right. This monotonic decreasing trend gives the assurance that the model is accurate at predicting insolvencies, i.e. deciles associated with higher probability of insolvency scores should be associated with higher insolvency rates.

1.3. Reviewing the group scorecards D&B's approach was to consider the Weight of Evidence value (i.e. "WOE value" hereafter), a widely used measure of the "strength" of a grouping for separating good and bad risk (insolvency). It is computed from the basic odds ratio:

$$\text{Ln (Proportion of Non Insolvencies) / (Proportion of Insolvencies)}$$

For the group scorecards a WOE value is calculated for each of the variable's bands. For each variable there is only a single coefficient with which the WOE value for the appropriate band is multiplied.

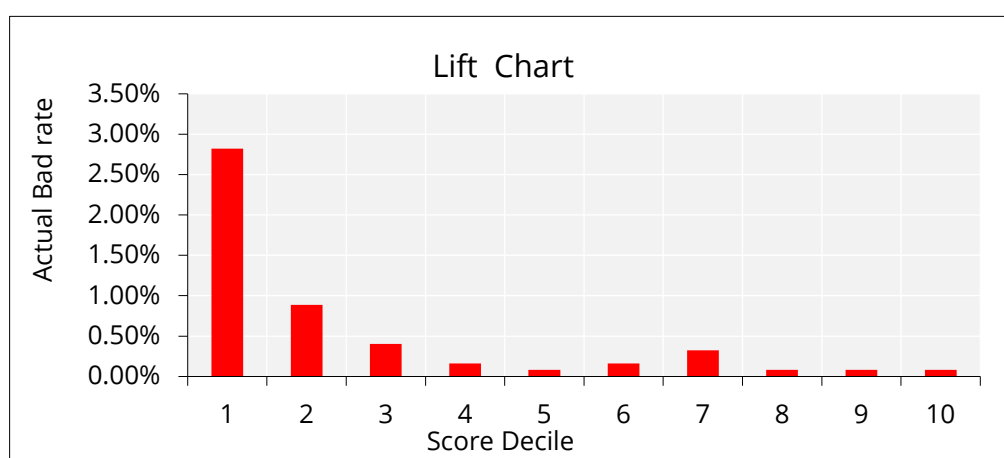
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<sup>1</sup> The p-value for each variable tests the null hypothesis that its coefficient is equal to zero (no effect). A low p-value (< 0.05) indicates that you can reject the null hypothesis. In other words, a predictor that has a low p-value is likely to be a meaningful addition to your model because changes in the predictor's value are related to changes in the response variable. Conversely, a larger (insignificant) p-value suggests that changes in the predictor are not associated with changes in the response. Significance scores in the tables show a percentage score (based upon 1-p score).

## 2. Scorecard 1: Non-Subsidiaries £30m+ or Large Subsidiaries

### 2.1. Baseline Model

Variables	Fill Rate	Weight	Significance	Impact
<b>Log Net Worth</b>	100%	2%	95+	-
<b>Log Creditor Days</b>	91%	2%	95+	+
<b>Log Total Assets</b>	100%	2%	95+	-
<b>Cash by Current Liabilities</b>	93%	91%	90+	-
<b>Log Pre-Tax Profit</b>	100%	2%	95+	-



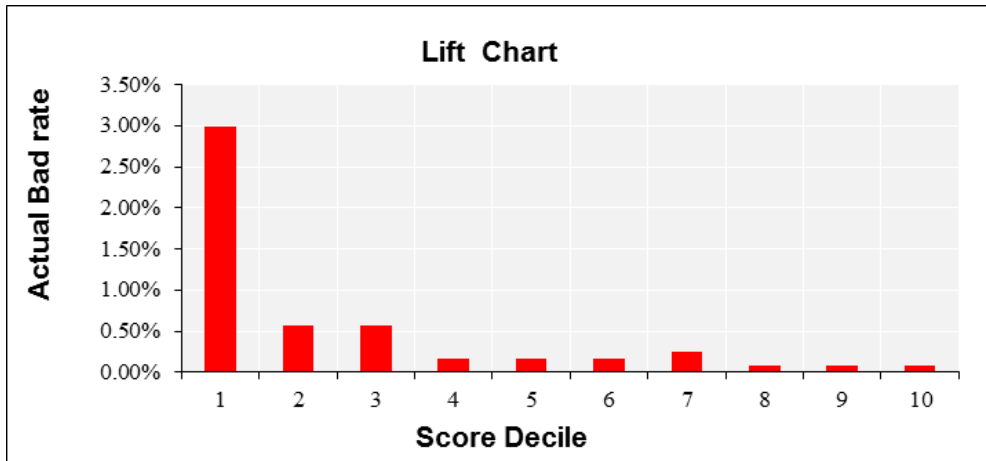
Variables	Coefficient	Replacement Value
<b>Intercept</b>	-1.2705	N/A
<b>Log Net Worth</b>	-0.0838	-10.2
<b>Log Creditor Days</b>	1.0636	1.35
<b>Log Total Assets</b>	-0.5694	5.013
<b>Cash by Current Liabilities</b>	-1.1438	0
<b>Log Pre-Tax Profit</b>	-0.0837	-10.53

Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.0838 + \text{Log Net Worth}) + (1.0636 * \text{Log Creditor Days}) +$   
 $(-0.5694 * \text{Log Total Assets}) + (-1.1438 * \text{Log Cash by Current Liabilities}) +$   
 $(-0.0837 * \text{Log Pre-Tax Profit}) - 1.2705$

Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$

2.2. Consultation Model

Variables	Fill Rate	Weight	Significance	Impact
<b>Log Net Worth</b>	100%	18%	95+	-
<b>Log Creditor Days</b>	91%	22%	95+	+
<b>Log Total Assets</b>	100%	19%	95+	-
<b>Log Cash by Current Liabilities</b>	93%	23%	95+	-
<b>Log Pre-Tax Profit</b>	100%	18%	95+	-



Variables	Coefficient	Replacement Value
<b>Intercept</b>	-1.4491	N/A
<b>Log Net Worth</b>	-0.0851	-10.2
<b>Log Creditor Days</b>	1.357	1.31737
<b>Log Total Assets</b>	-0.5863	5.013
<b>Log Cash by Current Liabilities</b>	-3.9768	0.10051
<b>Log Pre-Tax Profit</b>	-0.0828	-10.53

Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.0851 * \text{Log Net Worth}) + (1.357 * \text{Log Creditor Days}) +$   
 $(-0.5863 * \text{Log Total Assets}) + (-3.9768 * \text{Log Cash by Current Liabilities}) +$   
 $(-0.0828 * \text{Log Pre-Tax Profit}) - 1.4491$

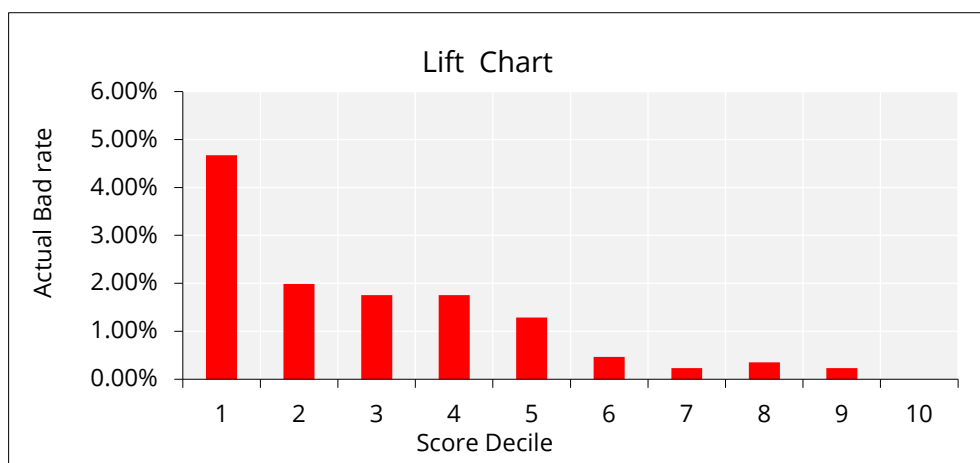
Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$



### 3. Scorecard 2: Non-subsidiaries <£30m

#### 3.1. Baseline model

Variables	Fill Rate	Weight	Significance	Impact
<b>Log Cash</b>	93%	10%	90+	-
<b>Capital Employed</b>	100%	21%	75+	-
<b>Log Pre-Tax Profit</b>	99%	32%	95+	-
<b>Log Creditors Days</b>	85%	29%	95+	+
<b>Log Current Liabilities</b>	100%	8%	80+	+



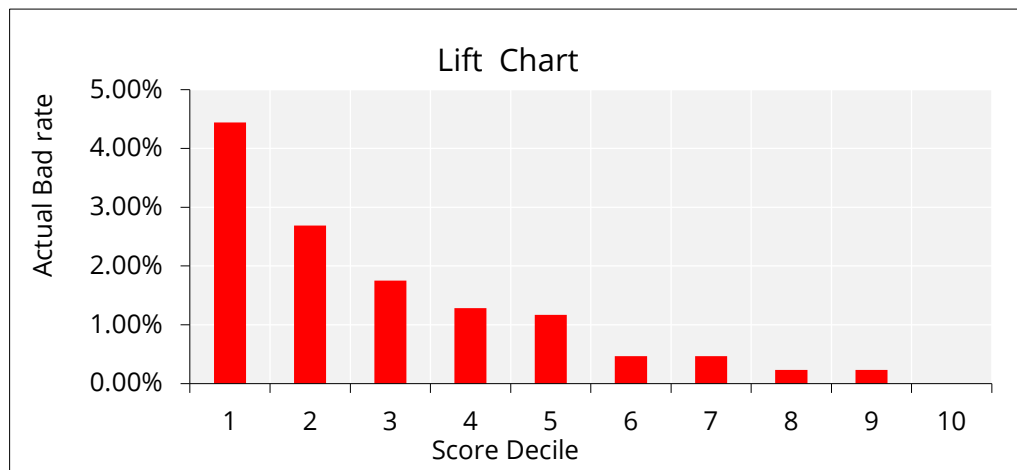
Variables	Coefficient	Replacement Value
<b>Intercept</b>	-6.3178	N/A
<b>Log Cash</b>	-0.1191	0.3
<b>Capital Employed</b>	-2.93E-09	-171600000
<b>Log Pre-Tax Profit</b>	-0.1069	-8.604
<b>Log Creditors Days</b>	1.1574	1.234
<b>Log Current Liabilities</b>	0.1576	9.447

Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.1191 * \text{Log Cash}) + (-0.00000000293 * \text{Capital Employed}) + (-0.1069 * \text{Log Pre-Tax Profit}) + (1.1574 * \text{Log Creditors Days}) + (0.1576 * \text{Log Current Liabilities}) - 6.3178$

Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$

### 3.2. Consultation model

Variables	Fill Rate	Weight	Significance	Impact
<b>Log Cash</b>	93%	9%	95+	-
<b>Capital Employed</b>	100%	17%	70+	-
<b>Log Pre-Tax Profit</b>	99%	27%	95+	-
<b>Log Creditors Days</b>	85%	44%	95+	+
<b>Log Current Liabilities</b>	100%	4%	60+	+



Variables	Coefficient	Replacement Value
<b>Intercept</b>	-7.6532	N/A
<b>Log Cash</b>	-0.116	0.3
<b>Capital Employed</b>	-0.00000000279	5765253
<b>Log Pre-Tax Profit</b>	-0.1073	-8.604
<b>Log Creditors Days</b>	2.3253	1.28645
<b>Log Current Liabilities</b>	0.1029	9.447

Therefore, in this case the tailored part of the formula becomes

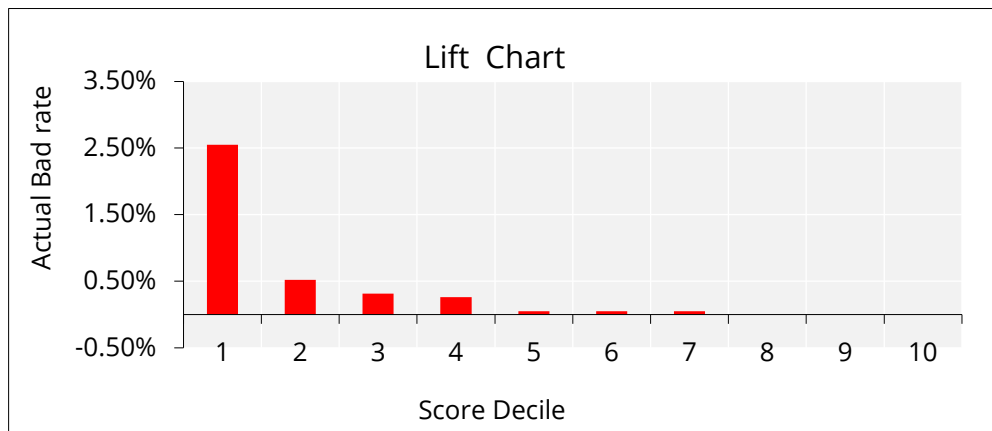
$$SC = (-0.116 * \text{Log Cash}) + (-0.00000000279 * \text{Capital Employed}) + (-0.1073 * \text{Log Pre-Tax Profit}) + (2.3253 * \text{Log Creditors Days}) + (0.1029 * \text{Log Current Liabilities}) - 7.6532$$

$$\text{Probability of Insolvency} = \frac{\exp(SC)}{1 + \exp(SC)}$$

4. Scorecard 3: Part of a group with £50m+ turnover

4.1. Baseline model

Variables	Fill Rate	Weight	Significance	Impact
Pre Tax Margin	100%	20%	95+	-
Average Remuneration per Employee	98%	18%	95+	-
Mortgage Age	40%	13%	95+	-
Change in Turnover	83%	16%	95+	-
Parent Strength	99%	32%	95+	-



Variable Name	Unit	Band	Coefficient	Variable Value (Weight of Evidence / Replacement Value)
Intercept	I	NA	-4.3639	I
Pre Tax Margin	%	Unknown	-0.6767	-2.1679833
		<2		-0.72356301
		2 to 6		0.47740313
		6 to 10		1.21941559
		>10		1.72088477
Average Remuneration per Employee	£Thousands	Unknown	-0.7705	0.87970868
		<7.5		-2.1679833
		7.5 to 17.5		-1.4404347
		17.5 to 35		-0.24785423
		35 to 50		-0.10910432
		>50		1.35461195

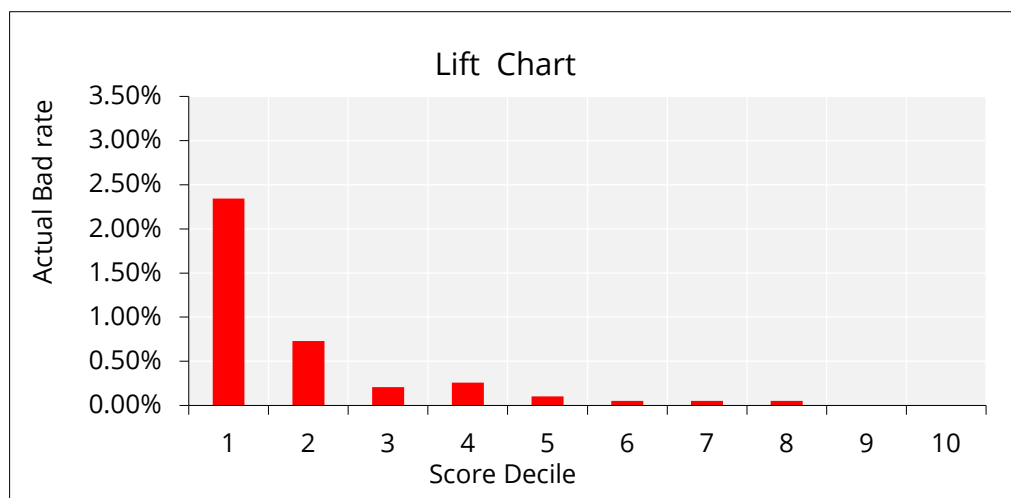
Mortgage Age	Years	Unknown	-0.5995	0.62850235
		None		-0.28597698
		0 to 1.5		-1.0926559
		1.5 to 5		-0.59042063
		5 to 7		0.27870211
		>7		1.34505353
Change in Turnover	Ratio	Unknown	-0.7552	-0.33775758
				-0.33775758
		<-0.625		-0.35969456
		-0.625 to -0.175		-0.70730326
		-0.175 to 0.05		-0.34929503
		0.05 to 0.2		1.47804661
		>0.2		0.51401619
Parent Strength	Score	Unknown	-0.0467	0
		Value Known		Score

Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.6767 * \text{Pre Tax Margin WoE}) + (-0.7705 * \text{Average Remuneration per Employee WoE}) + (-0.5995 * \text{Mortgage Age WoE}) + (-0.7552 * \text{Change in Turnover WoE}) + (-0.0467 * \text{Parent Strength}) - 4.3639$

Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$

4.2. Consultation model

Variables	Fill Rate	Weight	Significance	Impact
Pre Tax Margin	100%	18%	95+	-
Average Remuneration per Employee	98%	19%	95+	-
Log Cash by Current Liabilities	90%	11%	90+	-
Change in Turnover	83%	16%	95+	-
Parent Strength	99%	35%	95+	-



Variable Name	Unit	Band	Coefficient	Variable Value (Weight of Evidence / Replacement Value)
Intercept	I	NA	-4.0446	I
Pre Tax Margin	%	Unknown	-0.6419	-2.1679833
		<2		-0.72356301
		2 to 6		0.47740313
		6 to 10		1.21941559
		>10		1.72088477
Average Remuneration per Employee	£Thousands	Unknown	-0.8304	0.87970868
		<7.5		-2.1679833
		7.5 to 17.5		-1.4404347
		17.5 to 35		-0.24785423
		35 to 50		-0.10910432
		>50		1.35461195
Log Cash by Current Liabilities	Ratio	Unknown	-3.3976	Log10(1 + 0.230297099)
		Value Known		Log 10 (Ratio)
Change in Turnover	Ratio	Unknown	-0.7579	-0.33775758
				-0.33775758

		<-0.625		-0.35969456
		-0.625 to -0.175		-0.70730326
		-0.175 to 0.05		-0.34929503
		0.05 to 0.2		1.47804661
		>0.2		0.51401619
Parent Strength	Score	Unknown	-0.0505	0
		Value Known		Score

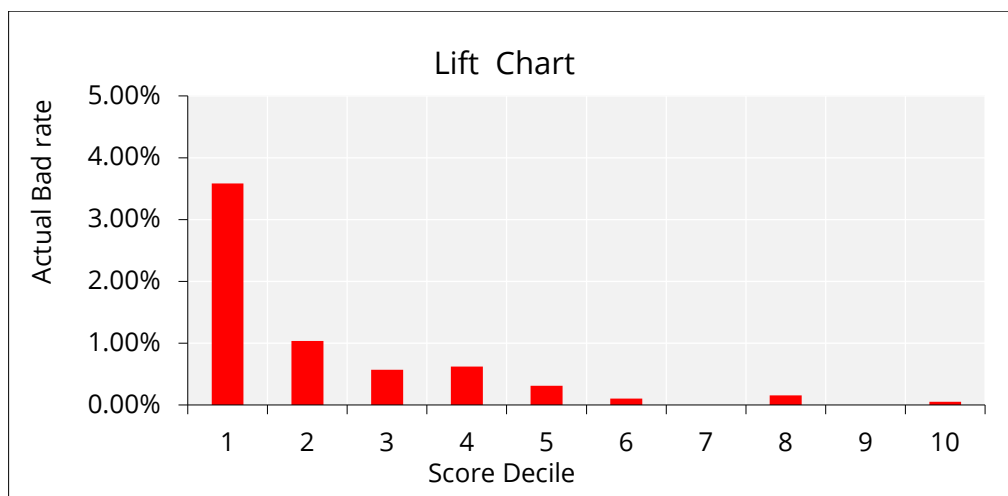
Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.6419 * \text{Pre Tax Margin WoE}) + (-0.8304 * \text{Average Remuneration per Employee WoE}) + (-3.3976 * \text{Log Cash by Current Liabilities}) + (-0.7579 * \text{Change in Turnover WoE}) + (-0.0505 * \text{Parent Strength}) - 4.0446$

Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$

5. Scorecard 4: Part of a group with turnover between £10m and £50m

5.1. Baseline model

Variables	Fill Rate	Weight	Significance	Impact
<b>Mortgage Age</b>	40%	9%	95+	-
<b>Pre-Tax Profit</b>	100%	18%	95+	-
<b>Change in Fixed Assets</b>	78%	9%	95+	-
<b>Capital Employed per Employee</b>	97%	19%	95+	-
<b>Parent Strength</b>	98%	46%	95+	-



Variable Name	Unit	Band	Coefficient	Variable Value (Weight of Evidence / Replacement Value)
Intercept	I	NA	-3.8977	I
Mortgage Age	Years	Unknown	-0.5677	0.34582123
		None		0.34582123
		<0.5		-1.2164022
		0.5 to 2.5		-0.46997061
		2.5 to 7		-0.14979299
		7 to 10		0.27881365
		>10		0.34582123
Pre Tax Profit	£Thousands	Unknown	-0.5775	-0.74040255
		<0		-0.74040255
		0 to 250		-0.45297925

		250 to 750		-0.32038239
		750 to 1000		0.55818926
		>1000		1.08558542
Change in Fixed Assets	%	Unknown	-0.7557	0.02613274
		<-75		-0.22802574
		-75 to -25		-0.44143546
		-25 to 50		0.39646051
		50 to 100		-0.35902869
		>100		0.02613274
Capital Employed Per Employee	£Thousands	Unknown	-0.6757	-0.68076769
		< 0		-0.68076769
		0 to 10		-0.68076769
		10 to 30		-0.53842198
		30 to 57.5		-0.0747981
		57.5 to 75		-0.14486444
		>75		1.07449227
Parent Strength	Score	Unknown	-0.0531	0
		Value Known		Score

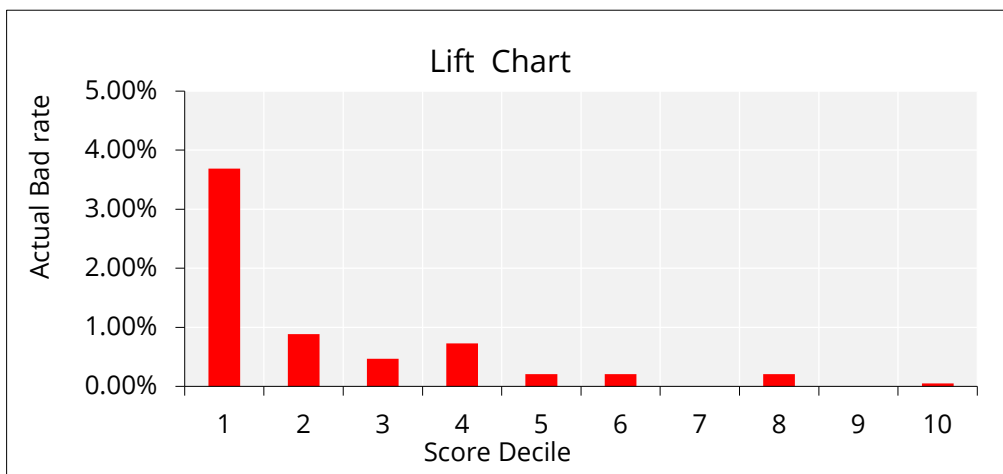
Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.5677 * \text{Mortgage Age WoE}) + (-0.5775 * \text{Pre-Tax Profit WoE}) +$   
 $(-0.7557 * \text{Change in Fixed Assets WoE}) + (-0.6757 * \text{Capital Employed per Employee WoE}) + (-0.0531 * \text{Parent Strength}) - 3.8977$

Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$



5.2. Consultation model

Variables	Fill Rate	Weight	Significance	Impact
Pre-Tax Profit	100%	15%	95+	-
Change in Fixed Assets	78%	9%	95+	-
Capital Employed per Employee	97%	16%	95+	-
Parent Strength	98%	46%	95+	-
Log Cash by Current Liabilities	87%	14%	95+	-



Variable Name	Unit	Band	Coefficient	Variable Value (Weight of Evidence / Replacement Value)
Intercept	I	N/A	-3.6317	I
Pre Tax Profit	£Thousands	Unknown	-0.5438	-0.74040255
		<0		-0.74040255
		0 to 250		-0.45297925
		250 to 750		-0.32038239
		750 to 1000		0.55818926
		>1000		1.08558542
Change in Fixed Assets	%	Unknown	-0.778	0.02613274
		<-75		-0.22802574
		-75 to -25		-0.44143546
		-25 to 50		0.39646051
		50 to 100		-0.35902869
		>100		0.02613274
Capital Employed Per Employee	£Thousands	Unknown	-0.6111	-0.68076769
		< 0		-0.68076769
		0 to 10		-0.68076769
		10 to 30		-0.53842198
		30 to 57.5		-0.0747981

		57.5 to 75		-0.14486444
		>75		1.07449227
Parent Strength	Score	Unknown	-0.0548	0
		Value Known		Score
Log Cash by Current Liabilities	Ratio	Unknown	-2.5509	$\text{Log}10(1 + 0.30836826)$
		Value Known		$\text{Log} 10 (\text{Ratio})$

Therefore, in this case the tailored part of the formula becomes

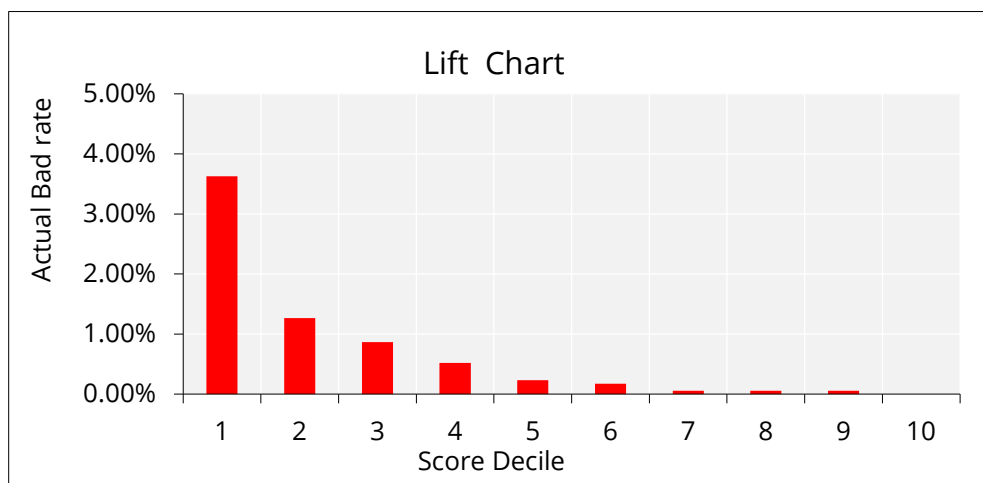
$$SC = (-0.5438 * \text{Pre-Tax Profit WoE}) + (-0.7780 * \text{Change in Fixed Assets WoE}) + (-0.6111 * \text{Capital Employed per Employee WoE}) + (-0.0548 * \text{Parent Strength}) + (-2.5509 * \text{Log Cash by Current Liabilities}) - 3.6317$$

$$\text{Probability of Insolvency} = \frac{\exp(SC)}{1 + \exp(SC)}$$

## 6. Scorecard 5: Part of a group with turnover under £10m

### 6.1. Baseline model

Variables	Fill Rate	Weight	Significance	Impact
Shareholders Funds	100%	16%	95+	-
Return on Capital	88%	7%	95+	-
Creditors Days	71%	16%	95+	-
Change in Employee Remuneration	61%	18%	95+	-
Mortgage Age	40%	5%	90+	-
Parent Strength	98%	37%	95+	-



Variable Name	Unit	Band	Coefficient	Variable Value (Weight of Evidence / Replacement Value)
Intercept	1	N/A	-3.973	1
Shareholders Funds	£Millions	Unknown	-0.6383	-0.02512923
		<0		-0.89095845
		0 to 0.5		0.34144491
		0.5 to 3		0.02353005
		3 to 27.5		0.50529114
		27.5 to 50		2.07874633
		>50		2.20795806
Return on Capital	%	Unknown	-0.4249	-0.74816507
		<0		-0.46891027

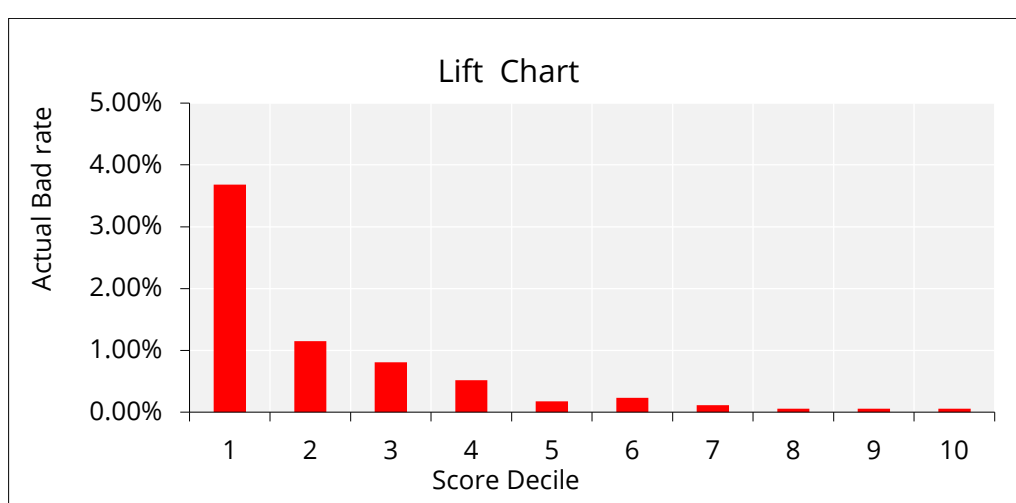
		0 to 2.5		0.35287146
		2.5 to 10		0.55918924
		10 to 15		0.70274366
		>15		0.68859057
Creditors Days (Sales Based)	Ratio	Unknown	-0.6904	0.70053282
		0		-0.78777421
		0 to 2.5		1.05805248
		2.5 to 12.5		1.09705464
		12.5 to 30		0.00707066
		30 to 40		-0.89810898
		>40		-0.8466803
Change in Employee Remuneration	%	Unknown	-0.8986	-0.04550623
		<-60		-0.37998081
		-60 to -10		-0.19729756
		-10 to 20		0.08490233
		20 to 40		-0.02512923
		>40		2.28168718
Mortgage Age	Years	Unknown	-0.5923	0.00521251
		None		0.94682685
		<1		-0.37928338
		1 to 6		-0.20490372
		6 to 10		-0.14015547
		>10		0.73520314
Parent Strength	Score	Unknown	-0.0505	0
		Value Known		Score

Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.6383 * \text{Shareholders Funds WoE}) + (-0.4249 * \text{Return on Capital WoE}) + (-0.6904 * \text{Creditors Days WoE}) + (-0.8986 * \text{Change in Employee Remuneration WoE}) + (-0.5923 * \text{Mortgage Age WoE}) + (-0.0505 * \text{Parent Strength}) - 3.973$

Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$

## 6.2. Consultation model

Variables	Fill Rate	Weight	Significance	Impact
Shareholders Funds	100%	15%	95+	-
Return on Capital	88%	7%	95+	-
Change in Employee Remuneration	61%	18%	95+	-
Parent Strength	98%	35%	95+	-
Log Creditors Days	71%	14%	95+	+
Log Cash by Current Liabilities	78%	10%	90+	-



Variable Name	Unit	Band	Coefficient	Variable Value (Weight of Evidence / Replacement Value)
Intercept	1	N/A	-5.1925	1
Shareholders Funds	£Millions	Unknown	-0.6235	-0.02512923
		<0		-0.89095845
		0 to 0.5		0.34144491
		0.5 to 3		0.02353005
		3 to 27.5		0.50529114
		27.5 to 50		2.07874633
		>50		2.20795806
Return on Capital	%	Unknown	-0.4036	-0.74816507
		<0		-0.46891027
		0 to 2.5		0.35287146
		2.5 to 10		0.55918924
		10 to 15		0.70274366
		>15		0.68859057
	%	Unknown	-0.9271	-0.04550623

Change in Employee Remuneration		<-60		-0.37998081
		-60 to -10		-0.19729756
		-10 to 20		0.08490233
		20 to 40		-0.02512923
		>40		2.28168718
Parent Strength	Score	Unknown	-0.0468	0
		Zero or other value		Score
Log Creditor Days	Ratio	Unknown	1.0606	Log10(13.74483782)
		< 1		Log 10 (1)
		1 to 60		Log 10 (Ratio)
		> 60		Log 10 (60)
Log Cash by Current Liabilities	Ratio	Unknown	-1.1562	Log10(1 + 0.56358)
		Value Known		Log 10 (Ratio)

Therefore, in this case the tailored part of the formula becomes

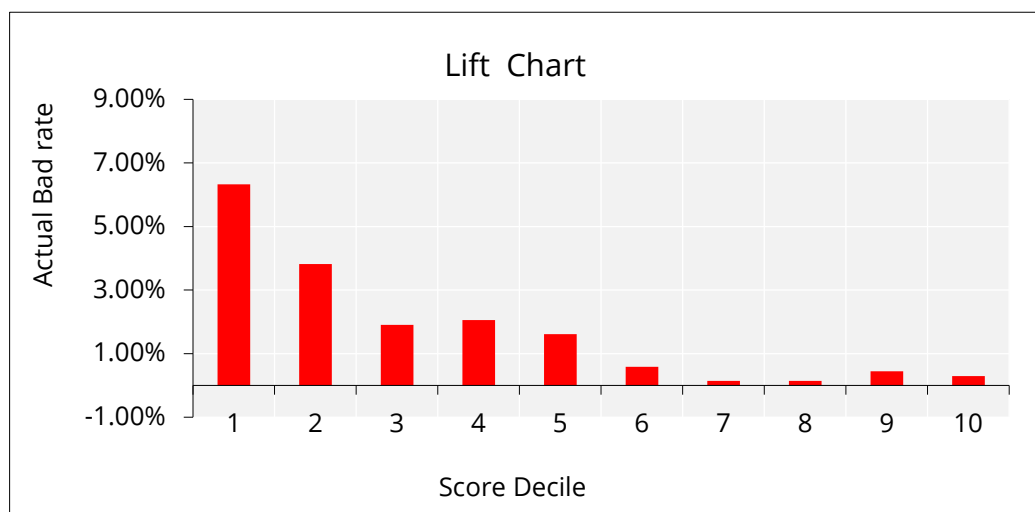
$$SC = (-0.6235 * \text{Shareholders Funds WoE}) + (-0.4036 * \text{Return on Capital WoE}) + (-0.9271 * \text{Change in Employee Remuneration WoE}) + (-0.0468 * \text{Parent Strength}) + (1.0606 * \text{Log Creditor Days}) + (-1.1562 * \text{Log Cash by Current Liabilities}) - 5.1925$$

$$\text{Probability of Insolvency} = \exp(SC) / (1 + \exp(SC))$$

## 7. Scorecard 6: Group Small

### 7.1. Baseline model

Variables	Fill Rate	Weight	Significance	Impact
<b>Parent Strength</b>	98%	9%	95+	+
<b>Log Current Liabilities</b>	100%	22%	95+	+
<b>Cash</b>	61%	54%	95+	-
<b>Log Retained Earnings</b>	100%	8%	95+	-
<b>Log Debtors</b>	89%	7%	95+	-
<b>Log Net Worth</b>	100%	1%	15+	-



Variables	Coefficient	Replacement Value
<b>Intercept</b>	-4.8207	N/A
<b>Parent Strength</b>	24.6106	0
<b>Log Current Liabilities</b>	0.3183	5.836
<b>Cash</b>	-0.00000156	0
<b>Log Retained Earnings</b>	-0.0647	-8.909
<b>Log Debtors</b>	-0.1504	10.29
<b>Log Net Worth</b>	-0.00475	-8.759

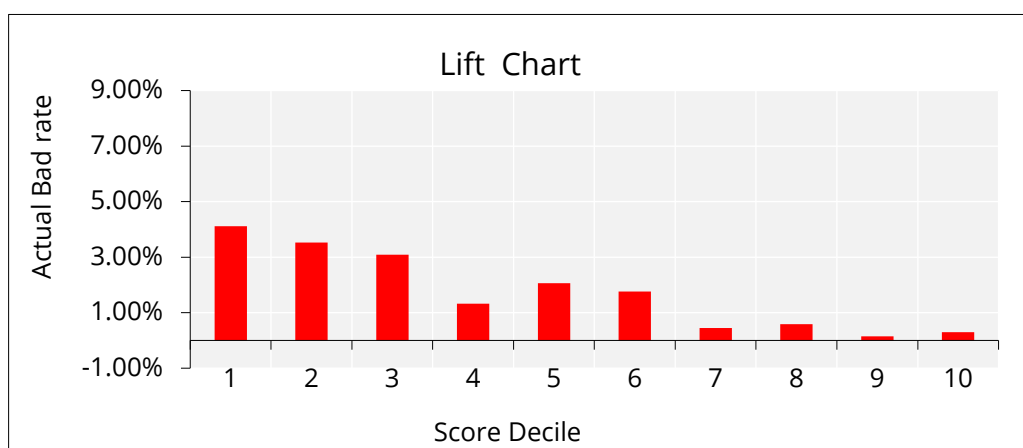
Therefore, in this case the tailored part of the formula becomes

$$SC = (24.6106 * \text{Parent Strength}) + (0.3183 * \text{Log Current Liabilities}) + (-0.00000156 * \text{Cash}) + (-0.0647 * \text{Log Retained Earnings}) + (-0.1504 * \text{Log Debtors}) + (-0.00475 * \text{Log Net Worth}) - 4.8207$$

$$\text{Probability of Insolvency} = \frac{\exp(SC)}{1 + \exp(SC)}$$

## 7.2. Consultation model

Variables	Fill Rate	Weight	Significance	Impact
<b>Parent Strength</b>	98%	24%	95+	+
<b>Log Current Liabilities</b>	100%	20%	95+	+
<b>Cash</b>	61%	13%	95+	-
<b>Log Retained Earnings</b>	100%	11%	80+	-
<b>Log Debtors</b>	89%	19%	95+	+
<b>Log Net Worth</b>	100%	13%	95+	-



Variables	Coefficient	Replacement Value
<b>Intercept</b>	-5.78701534836878	N/A
<b>Parent Strength</b>	3.04538813366191	0
<b>Log Current Liabilities</b>	0.20728514056409	5.836
<b>Cash</b>	-0.00000149239377	0
<b>Log Retained Earnings</b>	-0.05227231050320	-8.909
<b>Log Debtors</b>	0.21882369490403	10.29
<b>Log Net Worth</b>	-0.06982185375496	-8.759

Therefore, in this case the tailored part of the formula becomes  

$$SC = (3.04538813366191 * \text{Parent Strength}) + (0.207285140564088 * \text{Log Current Liabilities}) + (-1.49239377138899E-06 * \text{Cash}) + (-0.0522723105032014 * \text{Log Retained Earnings}) + (0.218823694904031 * \text{Log Debtors}) + (-0.0698218537549641 * \text{Log Net Worth}) - 5.78701534836878$$

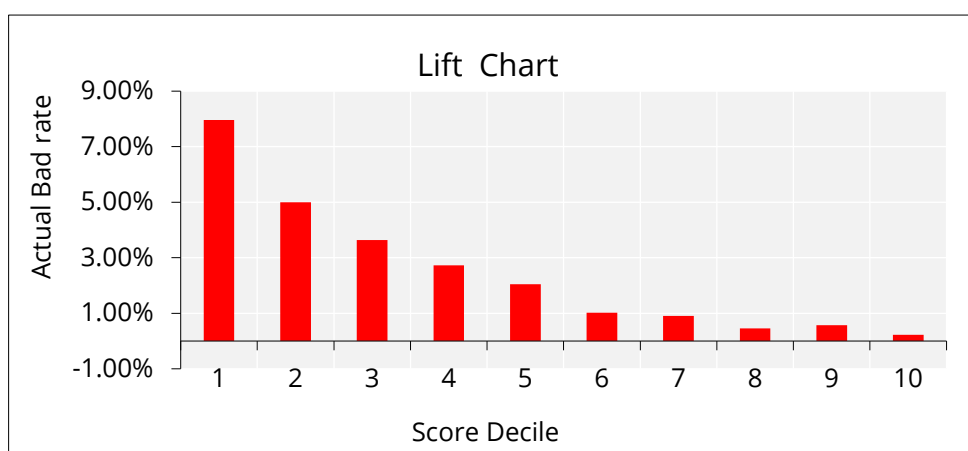
Probability of Insolvency =  $(0.6980) * \exp(SC) / (1 + \exp(SC))$



## 8. Scorecard 7: Independent Small

### 8.1. Baseline model

Variables	Fill Rate	Weight	Significance	Impact
<b>Log Retained Earnings</b>	100%	1%	95+	-
<b>Cash</b>	89%	8%	95+	-
<b>Total Assets</b>	100%	6%	95+	-
<b>Change in Total Assets</b>	78%	83%	35+	-
<b>Log in Total Liabilities</b>	100%	2%	95+	+



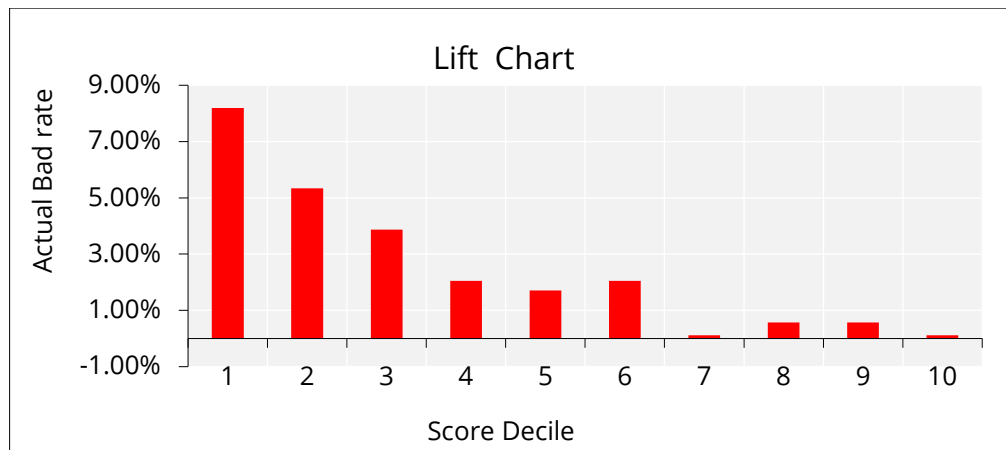
Variables	Coefficient	Replacement Value
<b>Intercept</b>	-5.4202	N/A
<b>Log Retained Earnings</b>	-0.0725	0
<b>Cash</b>	-0.00000308	0
<b>Total Assets</b>	-0.000000193	0
<b>Change in Total Assets</b>	-0.00002	0.2
<b>Log in Total Liabilities</b>	0.4856	1.505

Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.0725 * \text{Log Retained Earnings}) + (-0.00000308 * \text{Cash}) +$   
 $(-0.000000193 * \text{Total Assets}) + (-0.00002 * \text{Change in Total Assets}) +$   
 $(0.4856 * \text{Log in Total Liabilities}) - 5.4202$

Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$

8.2. Consultation model

Variables	Fill Rate	Weight	Significance	Impact
<b>Log Retained Earnings</b>	100%	10%	80+	-
<b>Cash</b>	89%	20%	95+	-
<b>Total Assets</b>	100%	16%	95+	-
<b>Change in Total Assets</b>	78%	20%	95+	-
<b>Log Total Liabilities</b>	100%	34%	95+	+



Variables	Coefficient	Replacement Value
<b>Intercept</b>	-6.22659047988968	N/A
<b>Log Retained Earnings</b>	-0.03616525978986	0
<b>Cash</b>	-0.00000301137650	0
<b>Total Assets</b>	-0.00000029010159	0
<b>Change in Total Assets</b>	-0.76247256190713	0.2
<b>Log Total Liabilities</b>	0.61965992413825	1.505

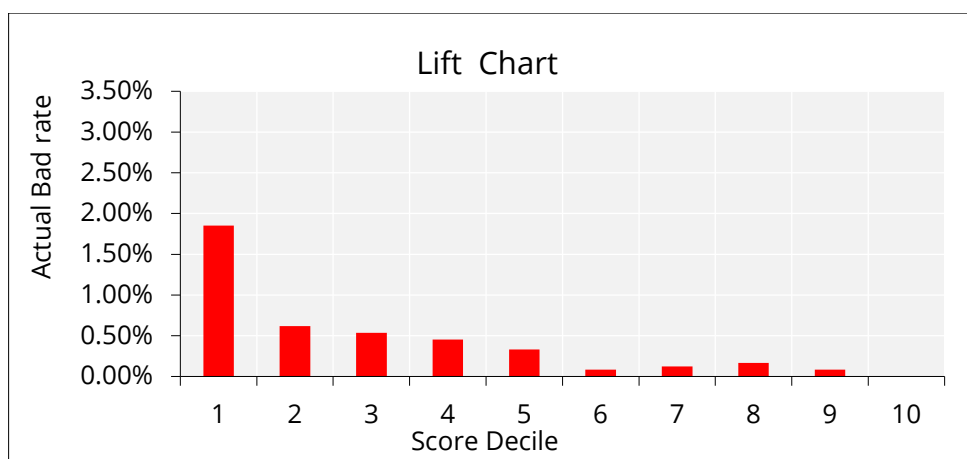
Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.0361652597898648 * \text{Log Retained Earnings}) + (-3.01137649578911e-06 * \text{Cash}) + (-2.90101594123924e-07 * \text{Total Assets}) + (-0.762472561907129 * \text{Change in Total Assets}) + (0.619659924138246 * \text{Log in Total Liabilities}) - 6.22659047988968$

Probability of Insolvency =  $(1.10505) * \exp(SC) / (1 + \exp(SC))$

## 9. Scorecard 8: Not-for-Profit

### 9.1. Baseline model

Variables	Fill Rate	Weight	Significance	Impact
<b>Log Current Assets</b>	100%	0.5%	95+	-
<b>Equity Gearing</b>	98%	0.1%	95+	-
<b>Log Profit or Surplus</b>	92%	0.6%	95+	-
<b>Total Assets</b>	100%	98.0%	95+	-
<b>Log Total Liabilities</b>	100%	0.8%	95+	+



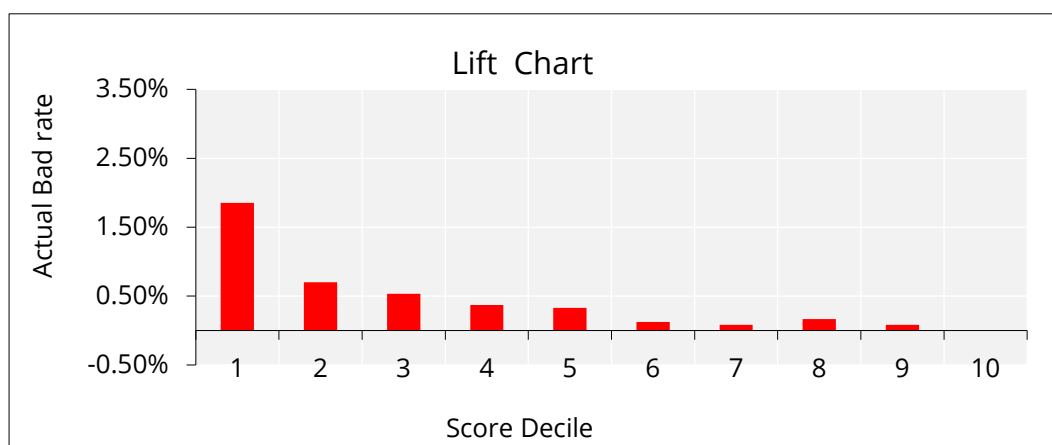
Variables	Coefficient	Replacement Value
<b>Intercept</b>	-5.249	N/A
<b>Log Current Assets</b>	-0.3243	0
<b>Equity Gearing</b>	-0.00125	0
<b>Log Profit or Surplus</b>	-0.1128	0
<b>Total Assets</b>	-0.000000114	0
<b>Log Total Liabilities</b>	0.4162	0.3

Therefore, in this case the tailored part of the formula becomes  
 $SC = (-0.3243 * \text{Log Current Assets}) + (-0.001253 * \text{Equity Gearing}) +$   
 $(-0.1128 * \text{Log Profit or Surplus}) + (-0.000000114 * \text{Total Assets}) +$   
 $(0.4162 * \text{Log Total Liabilities}) - 5.249$

Probability of Insolvency =  $\exp(SC) / (1 + \exp(SC))$

## 9.2. Consultation model

Final Scorecard			Gini 57.76%	
Variables	Fill Rate	Weight	Significance	Impact
<b>Log Current Assets</b>	100%	15%	95+	-
<b>Equity Gearing (%)</b>	98%	21%	95+	-
<b>Log Profit or Surplus</b>	92%	25%	95+	-
<b>Total Assets</b>	100%	21%	95+	-
<b>Log Total Liabilities</b>	100%	18%	95+	+



Variables	Coefficient	Replacement Value
<b>Intercept</b>	-5.13074360579722	N/A
<b>Log Current Assets</b>	-0.35019503753733	0
<b>Equity Gearing (%)</b>	-0.00081807840942	0
<b>Log Profit or Surplus</b>	-0.09423287583264	0
<b>Total Assets</b>	-0.00000012916453	0
<b>Log Total Liabilities</b>	0.45522572693158	0.3

Therefore, in this case the tailored part of the formula becomes  

$$SC = (-0.350195037537332 * \text{Log Current Assets}) + (-0.000818078409419197 * \text{Equity Gearing}) + (-0.0942328758326361 * \text{Log Profit or Surplus}) + (-1.29164526087994e-07 * \text{Total Assets}) + (0.45522572693158 * \text{Log Total Liabilities}) - 5.13074360579722$$

$$\text{Probability of Insolvency} = (0.8726) * \exp(SC) / (1 + \exp(SC))$$

## Appendix 4. Data definitions

The definitions of data items used by D&B

Data Element	D&B Derivation	D&B Descriptions
<b>Profit &amp; Loss Variables</b>		
<b>Sales</b>	Total Sales or Total Turnover, annualised if accounting period is not 52 weeks	Normally as presented, but for non-commercial entities (Banks, Insurance and Finance/Investment) specialist rules are applied to create an "equivalent". Where a unique, individual headline value is not shown, a disclosed sub-total headline will be used. This sub-total will be labelled as Total Operating Income OR Total Income, which will typically apply on Not-For-Profit entities (Charities, Clubs, Associations, etc.). For Charitable entities this sub-totalled value will refer to the grand total from all fund types. Such entities can disclose unique columns for specific fund types e.g. Unrestricted and Restricted, and then disclose an aggregate (total) column. Please note that D&B is unable to capture Sales/Turnover if it is disclosed as a "negative" value, nor can it capture a value if the Cost of Sales is disclosed as a "negative" (credit).

<b>Other Income</b>	Other Operating Income + Total Financial Income, annualised if accounting period is not 52 weeks	Other Operating Income will relate to the sum of any income item that appears between Headline Sales/Turnover and Operating Profit. Total Financial Income will relate to the sum of any income item that appears between Operating Profit and Pre-Tax Profit. The notes will be used to ensure that items reflect "gross" income values e.g. a headline value on the face of the P&L may relate to a "net" Interest Received (paid) value. The sum of Other Operating Income + Total Financial Income (Other Income) will be used as a "proxy" for Sales/Turnover where no Sales/Turnover value is available. This will typically arise on entities who have no trading activity e.g. non-consolidated holding companies.
<b>Pre-Tax Profit</b>	Pre-Tax Profit, annualised if accounting period is not 52 weeks	As presented, but can be labelled as "Surplus" (Deficit) on Not-For-Profit entities. On LLP entities it will refer to the Profit available to members, AFTER any members' remuneration charged as an expense. This is in-line with the relevant SORP. For charitable entities there will often be numerous "headline" values related to net income and the overall movement in funds. D&B's approach is to use the "headline" Net Income prior to Investment Gains/Losses and also prior to "Other recognised gains and losses". We believe this is the most appropriate "equivalent" to Pre-Tax profit, albeit we acknowledge that Total Investment Gains/Losses might include an element of realised gains/losses. On a standard commercial entity, Pre-Tax Profit only reflects realised gains/losses. "Other recognised gains and losses" are always disclosed separately and will never be reflected in the Profit/Loss for the year. Such gains/losses will include unrealised gains/losses from valuation adjustments on Property and Investment Assets, together with actuarial gains/losses on pension schemes. On a charitable entity these unrealised items will be reflected in the overall movement in funds.

Balance Sheet Variables		
<b>Total Assets</b>	Total Assets	As presented, the sum of all Assets, both Current and Non-Current (Long Term). For charitable entities with separate columns for restricted / unrestricted funds, it will relate to the aggregate total
<b>Current Assets</b>	Current Assets	As presented, the sum of all Current Assets. For charitable entities with separate columns for different funds, it will relate to the aggregate total
<b>Cash</b>	Cash	As presented, a component within the Current Asset Schedule. For charitable entities with separate columns for restricted / unrestricted funds, it will relate to the aggregate total
<b>Current Liabilities</b>	Current Liabilities	As presented, albeit it is more likely to be labelled as "Creditors Due Within One Year". For charitable entities with separate columns for restricted / unrestricted funds relate to the aggregate total
<b>Long Term Liabilities</b>	Due to Group Companies Over 1 Year+ Mortgages/Loans + Hire Purchase Due After 1 Year + Other Long Term Liabilities - ( Provisions for Liabilities and Charges + Provision for Future Tax / Taxation + General Provision for Contingencies + Provision for Recall + Provision for Reorganisation and Redundancies + Provision for Warranties + Pension Liabilities )	The sum of all liabilities due for repayment beyond one year. This will typically reflect debt obligations scheduled for repayment beyond 12 months, together with miscellaneous creditors without a specified repayment date. Such liabilities will normally be presented as components of the headline Balance Sheet item known as "Creditors greater than one year".

<b>Total Liabilities</b>	Current Liabilities + Long Term Liabilities	The sum of Current Liabilities and Long-Term Liabilities, as defined
<b>Retained Earnings</b>	Retained Earnings	As presented within the Total Capital and Reserves section of the Balance Sheet, but can be labelled as Total Funds on Not-For-Profit entities
<b>Shareholders Funds</b>	Issued Shared Capital + Shared Premium Account + Reserves + Retained Earnings + Non-Repayable Grants	As presented, but where appropriate will include Non-Repayable Grants, which will not necessarily be disclosed within headline Total Capital and Reserves. D&B protocol is to view such grants as being permanent capital of the business. By definition the item cannot be considered a liability because it is non-repayable. D&B acknowledges that the accounting convention is to reflect this item as a form of long term Deferred Income, outside of Total Capital and Reserves. D&B's approach will have an impact on the derivation of Total Liabilities. Please note that for LLP entities D&B will treat "Members' Interests" strictly as presented i.e. Equity elements will be treated as Shareholders' Funds, whilst Loans/Debts will be treated as Liabilities. This approach is in-line with the relevant SORP. D&B has assumed these classifications into Equity and Liability elements are based on relevant accounting protocols.
<b>Net Worth</b>	Share Holders Funds - Intangible Assets	This derivation will use the D&B defined Shareholders' Funds (see above) less the disclosed Total Intangible Assets



<b>Debtors</b>	Trade Debtors + Other Receivables Debtors + Prepaid Expenses + Owing Due From Group Companies + Tax Recoverable + Amounts Owing / Due From Directors + Directors + Directors Account + Directors Loans	D&B does not capture a unique sub-total re Total Debtors but instead will capture all the components in various headline fields, such as Trade Debtors, or as granular fields in the case of Directors' receivables. Only items disclosed within the Current Asset Schedule or subsequent sub-schedules of Current Assets will be considered. This derivation will ensure that it matches the disclosed headline Debtor value in the vast majority of cases. On "small" entities, where this item is used on the scorecard, the derivation will match the disclosed value in all cases.
<b>Capital Employed</b>	Total Assets – Current Liabilities	This derivation will use the D&B defined Total Assets and Current Liabilities (see above).
<b>Ratio Variables</b>		
<b>Creditors Days</b>	$(\text{Trade Creditors} / (\text{Sales} * 52 / \text{Number of Weeks})) * 365$	Trade Creditors will be as presented in the Current Liability Schedule but will include alternative wordings such as Accounts Payable, Supplier Accounts, Amounts owed from the purchase of goods. Sales will either be Sales/Turnover OR Other Income, as appropriate
<b>Cash by Current Liabilities</b>	Cash / Current Liabilities	As per line item definitions (above)
<b>Pre-Tax Margin</b>	$(\text{Profit Before Tax} / \text{Sales}) * 100$	Pre-Tax Profit as per above line item definition. Sales will either be Sales/Turnover OR Other Income, as appropriate
<b>Average Remuneration per Employee</b>	$(\text{Remuneration} * 52 / \text{Number of Weeks}) / \text{Financial Employees}$	Remuneration will refer to Total Payroll (Staff) costs, as disclosed in the notes to the accounts. Financial employees will refer to the average number of employees, as disclosed in the notes to the accounts.

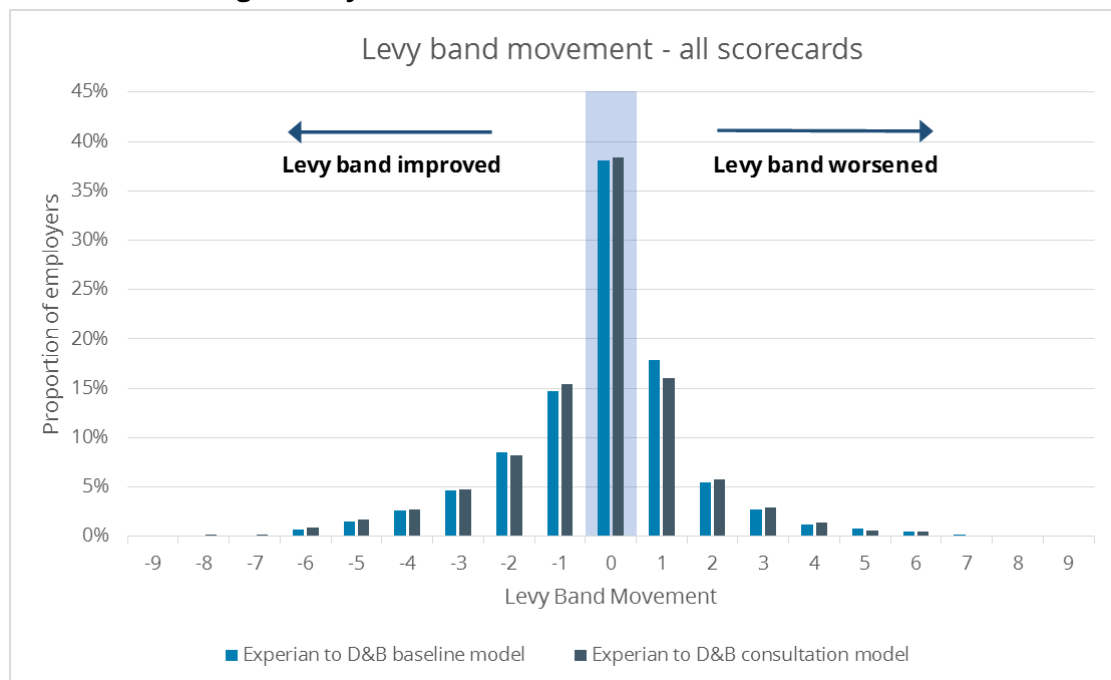
<b>Capital Employed per Employee</b>	Capital Employed / Financial Employees	As per line item definitions (above)
<b>Equity Gearing Ratio</b>	(Shareholders Funds / Total Assets ) * 100	As per line item definitions (above)
<b>Return on Capital</b>	((Profit Before Tax * 52 / Number of Weeks) / Capital Employed ) * 100	As per line item definitions (above)
<b>Growth Variables</b>		
<b>Change in Turnover</b>	([Total Turnover in Year N minus Total Turnover in Year N-3] divided by Total Turnover in Year N-3 ) * 100	As per line item definition (above), but in this context the "Turnover" value will either be the Sales/Turnover OR Other Income, as appropriate
<b>Change in Long Term Assets</b>	([Long Term Assets in Year N minus Long Term in Year N-3] divided by Long Term in Year N-3) * 100	Long Term Assets will be the sum of all Assets outside of Current Assets. These are otherwise known as Non-Current Assets OR Fixed Assets
<b>Change in Employee Remuneration</b>	([Employee Remuneration in Year N minus Employee Remuneration in Year N-3] divided by Employee Remuneration in Year N-3) * 100	As per line item definitions (above)
<b>Change in Total Assets</b>	([Total Assets in Year N minus Total Assets in Year N-3] divided by Total Assets in Year N-3) * 100	As per line item definitions (above)
<b>Mortgage Variable</b>		
<b>Mortgage Age</b>	Days (Score Date - Last Mortgage Created Date) / 365	This measures (in days) the time elapsed since the creation date of the most recent unsatisfied mortgage/charge and the score measurement date.

## Appendix 5. Change in levy band – by scorecard

### 1.1. Introduction

- 1.1.1. This appendix illustrates the impact of the change from the Experian model to the D&B models, on levy band, by scorecard.
- 1.1.2. As explained in the main consultation document, the analysis in this chapter uses insolvency scores which are based on the most recent accounting information available at 31 October 2019. Levy impact analysis additionally uses the scheme data submitted for the 2019/20 levy year.
- 1.1.3. Chart A5.1 below shows the impact for all scorecards combined (i.e. the same as chart 5.1 in the main body of the consultation document). This covers all employers and guarantors including those who change scorecard as a result of the move from Experian to D&B and those on credit rated scorecards.

**Chart A5.1: Change in levy bands – all scorecards**



- 1.1.4. These results are analysed further on the next page.

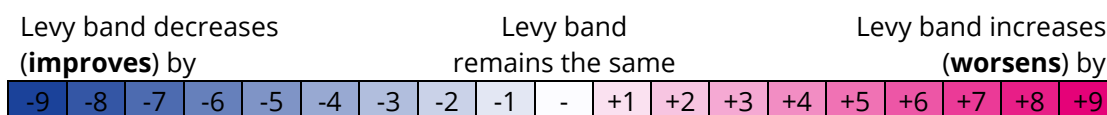
1.1.5. The distribution of levy band movements across all employers, as shown in chart A5.1 on the previous page, can also be displayed via the following colour-coded charts.

1.1.6. Each small square in these charts represents one per cent of employers, with the number in each square representing a levy band movement. For example, in chart A5.2 below: looking at the left-hand diagram, it can be seen that three per cent of employers see their levy band decrease (improve) by four as a result of moving from Experian to the D&B baseline, as represented by the three highlighted squares.

**Chart A5.2: Change in levy bands – all scorecards - percentile**



The colour key is as follows:



1.1.7. We expect that the overall impact of switching to either of the D&B models should be relatively similar across all employers combined, with the consultation model resulting in slightly better outcomes on the whole. Around 35-40 per cent of employers are expected to be unaffected by the change in provider. Of those who are affected, there is a nearly even split between those who would see their levy band improve and those who would see it worsen under both D&B models, with slightly more employers seeing their levy band improve.

1.1.8. The analysis can be broken down by individual scorecard, considering employers and guarantors which are allocated the same scorecard by both Experian and D&B. Breaking the analysis down by scorecard in this way shows that some types of employer would be affected more than others, and in different ways, by the change in insolvency provider.

1.1.9. Charts A5.3 and A5.4 below show the levy band movement for employers allocated by both Experian and D&B to scorecard 1 (i.e. the same data analysed for chart 5.2 in the main body of the consultation document) and scorecard 2.

**Chart A5.3: Change in levy bands – Scorecard 1 - percentile**

Experian to D&B baseline model										Experian to D&B consultation model									
-2	-	-	-	+1	+1	+1	+1	+1	+2	-3	-	-	-	+1	+1	+1	+1	+1	+2
-1	-	-	-	+1	+1	+1	+1	+1	+2	-2	-	-	-	+1	+1	+1	+1	+1	+2
-1	-	-	-	+1	+1	+1	+1	+1	+2	-1	-	-	-	+1	+1	+1	+1	+1	+2
-1	-	-	+1	+1	+1	+1	+1	+1	+2	-1	-	-	-	+1	+1	+1	+1	+1	+2
-1	-	-	+1	+1	+1	+1	+1	+1	+2	-1	-	-	-	+1	+1	+1	+1	+1	+2
-1	-	-	+1	+1	+1	+1	+1	+1	+3	-1	-	-	-	+1	+1	+1	+1	+1	+2
-1	-	-	+1	+1	+1	+1	+1	+1	+3	-1	-	-	-	+1	+1	+1	+1	+1	+3
-1	-	-	+1	+1	+1	+1	+1	+1	+3	-1	-	-	-	+1	+1	+1	+1	+1	+3
-	-	-	+1	+1	+1	+1	+1	+2	+4	-1	-	-	+1	+1	+1	+1	+1	+2	+3
-	-	-	+1	+1	+1	+1	+1	+2	+4	-	-	-	+1	+1	+1	+1	+1	+2	+3

**Chart A5.4: Change in levy bands – Scorecard 2 - percentile**

Experian to D&B baseline model										Experian to D&B consultation model									
-3	-	-	-	-	+1	+1	+1	+1	+3	-3	-	-	-	-	-	+1	+1	+1	+2
-1	-	-	-	+1	+1	+1	+1	+1	+3	-2	-	-	-	-	-	+1	+1	+1	+2
-	-	-	-	+1	+1	+1	+1	+1	+3	-2	-	-	-	-	-	+1	+1	+1	+2
-	-	-	-	+1	+1	+1	+1	+2	+3	-1	-	-	-	-	-	+1	+1	+1	+2
-	-	-	-	+1	+1	+1	+1	+2	+3	-1	-	-	-	-	-	+1	+1	+1	+3
-	-	-	-	+1	+1	+1	+1	+2	+4	-1	-	-	-	-	+1	+1	+1	+1	+3
-	-	-	-	+1	+1	+1	+1	+2	+4	-1	-	-	-	-	+1	+1	+1	+1	+3
-	-	-	-	+1	+1	+1	+1	+2	+5	-1	-	-	-	-	+1	+1	+1	+2	+5
-	-	-	-	+1	+1	+1	+1	+2	+6	-1	-	-	-	-	+1	+1	+1	+2	+6
-	-	-	-	+1	+1	+1	+1	+2	+7	-1	-	-	-	-	+1	+1	+1	+2	+7

1.1.10. Employers allocated to scorecards 1 and 2 are more likely to see their levy band worsen as a result of the changes. Broadly, scorecard 1 is used by subsidiaries and the largest non-subsiaries with over £30 million in annual turnover, while scorecard 2 is used by non-subsiaries with annual turnover of less than £30 million. The D&B consultation model would, overall, result in better outcomes than the D&B baseline model for these employers.

1.1.11. Charts A5.5, A5.6 and A5.7 below show the levy band movement for employers allocated by both Experian and D&B to scorecards 3, 4 and 5, which relate to group employers within various ranges of turnover. Note that Chart A5.5, reflecting scorecard 3, is based on the same data as chart 5.3 in the main body of the consultation document.

**Chart A5.5: Change in levy bands - Scorecard 3 - percentile**

Experian to D&B baseline model										Experian to D&B consultation model									
-6	-3	-2	-2	-1	-1	-	-	-	+1	-6	-3	-2	-2	-1	-1	-	-	+1	+2
-5	-3	-2	-2	-1	-1	-	-	-	+1	-6	-3	-2	-2	-1	-1	-	-	+1	+2
-5	-3	-2	-2	-1	-1	-	-	+1	+1	-5	-3	-2	-2	-1	-1	-	-	+1	+2
-4	-3	-2	-2	-1	-1	-	-	+1	+2	-5	-3	-2	-2	-1	-	-	-	+1	+2
-4	-3	-2	-2	-1	-1	-	-	+1	+2	-5	-3	-2	-2	-1	-	-	-	+1	+3
-4	-3	-2	-2	-1	-1	-	-	+1	+2	-4	-3	-2	-2	-1	-	-	+1	+1	+3
-4	-3	-2	-1	-1	-1	-	-	+1	+2	-4	-3	-2	-1	-1	-	-	+1	+1	+3
-4	-3	-2	-1	-1	-1	-	-	+1	+3	-4	-3	-2	-1	-1	-	-	+1	+2	+3
-3	-2	-2	-1	-1	-1	-	-	+1	+3	-4	-2	-2	-1	-1	-	-	+1	+2	+4
-3	-2	-2	-1	-1	-	-	-	+1	+3	-4	-2	-2	-1	-1	-	-	+1	+2	+4

**Chart A5.6: Change in levy bands - Scorecard 4 - percentile**

Experian to D&B baseline model										Experian to D&B consultation model									
-6	-3	-2	-1	-1	-	-	-	+1	+2	-6	-3	-2	-1	-1	-1	-	+1	+2	+3
-5	-3	-2	-1	-1	-	-	+1	+1	+3	-5	-3	-2	-1	-1	-	-	+1	+2	+3
-4	-3	-2	-1	-1	-	-	+1	+1	+3	-5	-3	-2	-1	-1	-	-	+1	+2	+3
-4	-2	-2	-1	-1	-	-	+1	+2	+3	-4	-3	-2	-1	-1	-	-	+1	+2	+3
-4	-2	-2	-1	-1	-	-	+1	+2	+3	-4	-3	-2	-1	-1	-	-	+1	+2	+3
-4	-2	-2	-1	-1	-	-	+1	+2	+3	-4	-3	-2	-1	-1	-	-	+1	+2	+3
-3	-2	-2	-1	-1	-	-	+1	+2	+4	-4	-2	-2	-1	-1	-	-	+1	+2	+4
-3	-2	-2	-1	-1	-	-	+1	+2	+4	-4	-2	-2	-1	-1	-	-	+1	+2	+4
-3	-2	-1	-1	-1	-	-	+1	+2	+4	-3	-2	-2	-1	-1	-	-	+1	+2	+4
-3	-2	-1	-1	-1	-	-	+1	+2	+5	-3	-2	-2	-1	-1	-	-	+1	+2	+5

**Chart A5.7: Change in levy bands - Scorecard 5 - percentile**

Experian to D&B baseline model										Experian to D&B consultation model									
-6	-4	-3	-3	-2	-1	-1	-	-	+1	-6	-4	-3	-2	-2	-1	-1	-	-	+1
-6	-4	-3	-3	-2	-1	-1	-	-	+1	-6	-4	-3	-2	-2	-1	-1	-	-	+1
-5	-4	-3	-2	-2	-1	-1	-	-	+1	-5	-4	-3	-2	-2	-1	-1	-	-	+1
-5	-4	-3	-2	-2	-1	-1	-	-	+1	-5	-4	-3	-2	-2	-1	-	-	+1	+1
-5	-4	-3	-2	-2	-1	-1	-	-	+2	-5	-4	-3	-2	-2	-1	-	-	+1	+2
-5	-4	-3	-2	-2	-1	-1	-	+1	+2	-5	-4	-3	-2	-1	-1	-	-	+1	+2
-5	-4	-3	-2	-2	-1	-1	-	+1	+2	-5	-3	-3	-2	-1	-1	-	-	+1	+2
-5	-4	-3	-2	-2	-1	-	-	+1	+2	-4	-3	-3	-2	-1	-1	-	-	+1	+2
-4	-4	-3	-2	-2	-1	-	-	+1	+3	-4	-3	-3	-2	-1	-1	-	-	+1	+3
-4	-3	-3	-2	-1	-1	-	-	+1	+4	-4	-3	-3	-2	-1	-1	-	-	+1	+3

1.1.12. Charts A5.5, A5.6 and A5.7 show that employers using scorecards 3, 4 and 5 are more likely to see their levy band improve as a result of the changes – in particular, scorecard 5 employers. The D&B consultation model slightly reduces this impact relative to the D&B baseline model for employers using scorecards 3 and 5, which are group employers with annual turnover of more than £50 million or less than £10 million respectively. The two models give a broadly similar impact for employers allocated to scorecard 4, which is used by group employers with annual turnover between £10 million and £30 million.

1.1.13. Chart A5.8 below shows the levy band movement for employers allocated by both Experian and D&B to scorecard 6, which is used by group employers filing SME accounts.

**Chart A5.8: Change in levy bands - Scorecard 6 - percentile**

Experian to D&B baseline model										Experian to D&B consultation model										
-3	-1	-1	-	-	-	-	-	+1	+2	-2	-1	-1	-1	-1	-	-	-	+1	+1	
-2	-1	-1	-	-	-	-	-	+1	+2	-1	-1	-1	-1	-1	-	-	-	+1	+2	
-2	-1	-	-	-	-	-	-	+1	+2	-1	-1	-1	-1	-1	-	-	-	+1	+2	
-2	-1	-	-	-	-	-	-	+1	+2	-1	-1	-1	-1	-	-	-	-	+1	+2	
-1	-1	-	-	-	-	-	-	+1	+1	+2	-1	-1	-1	-	-	-	-	+1	+3	
-1	-1	-	-	-	-	-	-	+1	+1	+3	-1	-1	-1	-1	-	-	-	+1	+3	
-1	-1	-	-	-	-	-	-	+1	+1	+3	-1	-1	-1	-1	-	-	-	+1	+3	
-1	-1	-	-	-	-	-	-	+1	+2	+3	-1	-1	-1	-1	-	-	-	+1	+4	
-1	-1	-	-	-	-	-	-	+1	+2	+3	-1	-1	-1	-1	-	-	-	+1	+1	+4
-1	-1	-	-	-	-	-	-	+1	+2	+4	-1	-1	-1	-1	-	-	-	+1	+1	+5

- 1.1.14. Under the D&B baseline model, the majority of employers allocated to scorecard 6 would not experience any levy band movement. Of those whose levy bands do change, slightly more employers would see their levy band worsen than those who would see it improve.
- 1.1.15. Under the D&B consultation model, a larger proportion of employers allocated to scorecard 6 would see their levy band improve, and fewer would see it worsen.
- 1.1.16. Chart A5.9 below shows the levy band movement for employers allocated by both Experian and D&B to scorecard 7, which is used by non-group employers filing SME accounts.

**Chart A5.9: Change in levy bands - Scorecard 7 - percentile**

Experian to D&B baseline model										Experian to D&B consultation model									
-1	-	-	-	-	-	+1	+1	+1	+2	-1	-	-	-	-	-	-	-	+1	+1
-1	-	-	-	-	-	+1	+1	+1	+2	-	-	-	-	-	-	-	-	+1	+1
-1	-	-	-	-	-	+1	+1	+1	+2	-	-	-	-	-	-	-	-	+1	+2
-	-	-	-	-	-	+1	+1	+1	+2	-	-	-	-	-	-	-	-	+1	+2
-	-	-	-	-	-	+1	+1	+1	+2	-	-	-	-	-	-	-	-	+1	+2
-	-	-	-	-	-	+1	+1	+2	+2	-	-	-	-	-	-	-	-	+1	+2
-	-	-	-	-	-	+1	+1	+2	+4	-	-	-	-	-	-	-	-	+1	+2
-	-	-	-	-	-	+1	+1	+2	+5	-	-	-	-	-	-	-	+1	+1	+3
-	-	-	-	-	-	+1	+1	+2	+6	-	-	-	-	-	-	-	+1	+1	+5
-	-	-	-	-	-	+1	+1	+2	+9	-	-	-	-	-	-	-	+1	+1	+8

- 1.1.17. Very few employers allocated to scorecard 7 are expected to experience an improvement in levy band. Under both D&B models, the majority of employers should be unaffected, but between 23 and 30 per cent see their levy band worsen – some significantly. The D&B consultation model would result in better outcomes than the D&B baseline model for many employers allocated to scorecard 7.



1.1.18. Chart A5.10 below shows the levy band movement for employers allocated by both Experian and D&B to scorecard 8.

**Chart A5.10: Change in levy bands – Scorecard 8 - percentile**

Experian to D&B baseline model										Experian to D&B consultation model									
-5	-1	-	-	-	-	-	-	-	-	-5	-1	-	-	-	-	-	-	-	-
-2	-1	-	-	-	-	-	-	-	-	-2	-1	-	-	-	-	-	-	-	-
-1	-1	-	-	-	-	-	-	-	-	-1	-1	-	-	-	-	-	-	-	-
-1	-1	-	-	-	-	-	-	-	+1	-1	-1	-	-	-	-	-	-	-	-
-1	-1	-	-	-	-	-	-	-	+1	-1	-1	-	-	-	-	-	-	-	-
-1	-1	-	-	-	-	-	-	-	+1	-1	-1	-	-	-	-	-	-	-	+1
-1	-1	-	-	-	-	-	-	-	+1	-1	-1	-	-	-	-	-	-	-	+1
-1	-1	-	-	-	-	-	-	-	+2	-1	-1	-	-	-	-	-	-	-	+1
-1	-	-	-	-	-	-	-	-	+2	-1	-1	-	-	-	-	-	-	-	+2
-1	-	-	-	-	-	-	-	-	+6	-1	-	-	-	-	-	-	-	-	+6

1.1.19. Not-for-profit organisations are allocated to scorecard 8. They are much less likely to experience any change in their levy band (around 75 per cent remaining in the same band under both models), but for those whose band does change, it is more likely to improve than to worsen, with the consultation model marginally more favourable than the baseline model.

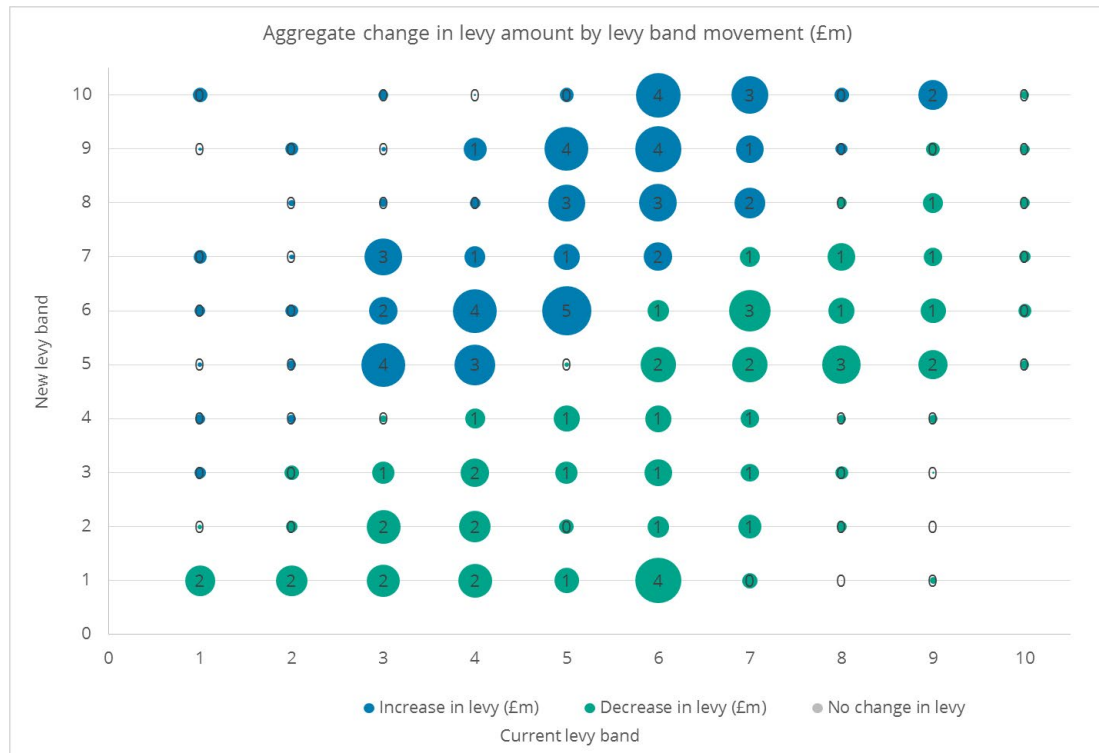
**1.2. Change in levy amount**

1.2.1. Levy impact analysis has been conducted using the scheme data used for the 2019/20 levy year. In determining the impact on levy amount, we have assumed that the total amount of levy collected from the population for analysis is unchanged by the proposed move to the D&B consultation model. In order to achieve this, we have applied an adjusted levy scaling factor to calculate the risk-based levies under the D&B models.

1.2.2. We note that the analysis in this section is affected by the current data gaps, and it is expected that self-submission will reduce the number of employers which currently appear to have large increases in levy bands.

1.2.3. Chart A5.11 below illustrates the aggregate monetary amount of the change by showing the total change in levy corresponding to each of the 100 (10 x 10) potential changes in levy band. The diagonal of bubbles from bottom left to top right represents employers which remain in the same levy band. Bubbles above and below the diagonal represent, respectively, employers which move to a worse or improved levy band.

**Chart A5.11: Aggregate change in levy amount by levy band movement (£m)**



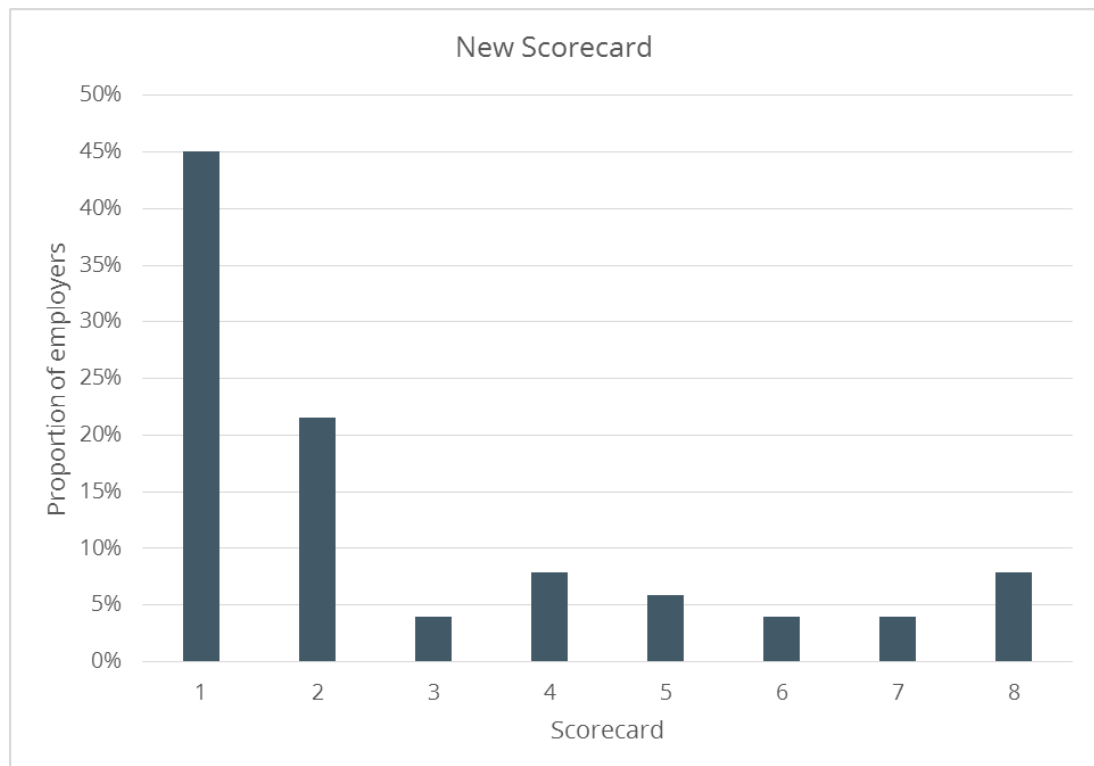
1.2.4. Chart A5.11 shows the total change in levy amount, caused by employers moving from one levy band to another levy band. To the top left are increases in levy, caused by a rise in band. Towards the bottom right are the decreases in levy as levy band reduces. The diagonal shows that employers staying on the same levy band see a reduction in levy, due to the increased amount from those with increases in levy band.

1.2.5. The more significant amounts of increases where employers in bands 4 to 6 see an increase in levy band. The large decrease from levy band 6 to levy band 1 includes a number of larger levy payers contributing to the overall amount.

### 1.3. S&P Credit Model

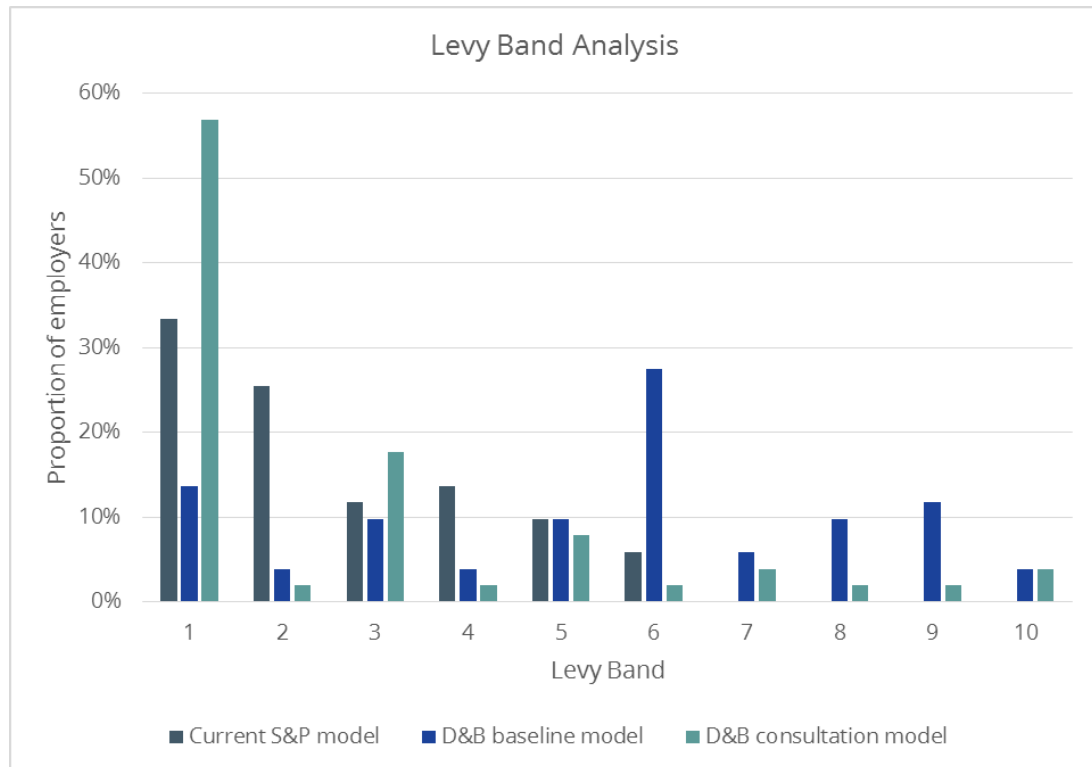
- 1.3.1. As discussed in section 4 of the consultation document, we propose to discontinue the use of the S&P Credit Model for scoring purposes.
- 1.3.2. In analysing the impact of this change, we note that some companies may choose to self-submit account information which is not currently available to D&B for use in insolvency scoring. We expect that this will lead to an improvement in levy band for some employers.
- 1.3.3. We expect that many of the employers currently on the S&P Credit Model will in future be captured under scorecard 1, with others spread amongst the other scorecards, as shown in chart A5.12 below.

**Chart A5.12: New scorecards for employers currently using S&P Credit Model**



1.3.4. Chart A5.13 below illustrates the impact on levy band, looking at the current distribution of levy band compared to the distribution after rescoring on the D&B baseline model and the D&B consultation model.

**Chart A5.13: Levy Band Analysis for employers currently using S&P credit model**



1.3.5. Chart A5.13 above sets out that the removal of the S&P Credit Model results initially in a number of schemes seeing a significant increase in levy band. However under the D&B consultation model, the majority of employers see a reduction (improvement) in levy band, with a small number seeing an increase (worsening).