

Results of modelling exercise

Introduction

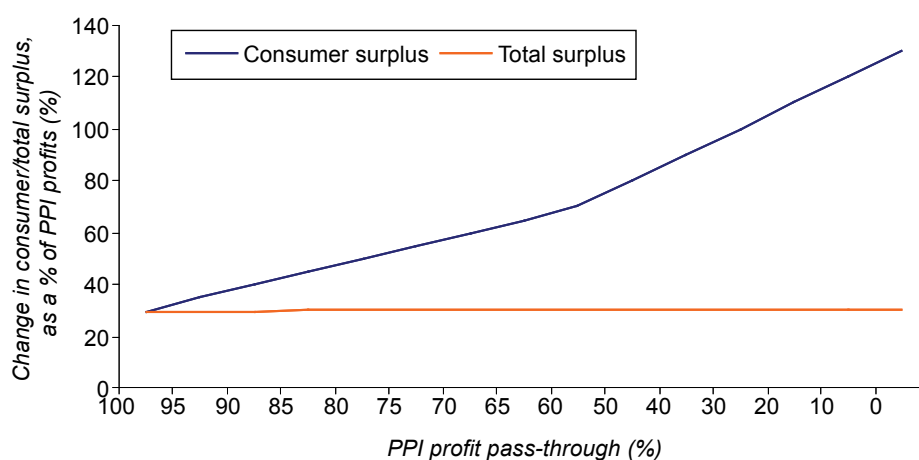
1. This appendix sets out the results of our remedies modelling exercise. We used Excel-based economic models to assess the possible effects of waterbed effects on the markets for PPI and credit and the economic welfare of consumers in those markets. In particular, we assess whether the imposition of remedies will result in an increase in total consumer welfare.
2. The modelling process we undertook was as follows. First, we modelled the effects of a 'non-system' remedy. We tested the sensitivity of our results to changes in three key parameters of our model. These were: (i) the proportion of PPI profits passed through in the form of low credit prices; (ii) the value of the assumption regarding the market elasticity of credit demand; and (iii) the relative size of PPI prices as a proportion of the price of a bundle of PPI and credit.
3. Where we found that imposing a non-system remedy would result in an increase in total consumer welfare, within all reasonable values of the three key parameters outlined above, we undertook no further modelling. This is because a 'system remedy' would deliver a more advantageous outcome for consumers than a non-system remedy (see Appendix 7); therefore if we find that a non-system remedy will unambiguously increase total consumer welfare, we know that this will also be the case for a system remedy.
4. Where we found that we could not exclude the possibility that a non-system remedy would reduce total consumer welfare, we undertook a further modelling exercise to assess the impact on consumers of a system remedy.

Mortgages

5. We found that, under any sensible set of values for parameters (i) to (iii) in paragraph 2, a non-system remedy would increase total consumer welfare in the markets for MPPI.
6. Figure 1 shows the impact of a non-system remedy on the level of consumer surplus and on the level of total surplus respectively. The figure shows the effects of the remedy under a range of assumptions regarding the PPI profit pass-through (the amount of PPI profits passed through to credit consumers as reduced credit prices). The chart shows that even under a 100 per cent pass-through, such that all PPI profits are competed away in the form of lower credit prices, there is a large increase in consumer surplus after the remedy has been imposed.

FIGURE 1

The effect of a non-system remedy on consumer and total surplus, sensitivity of results to 'pass-through' assumption

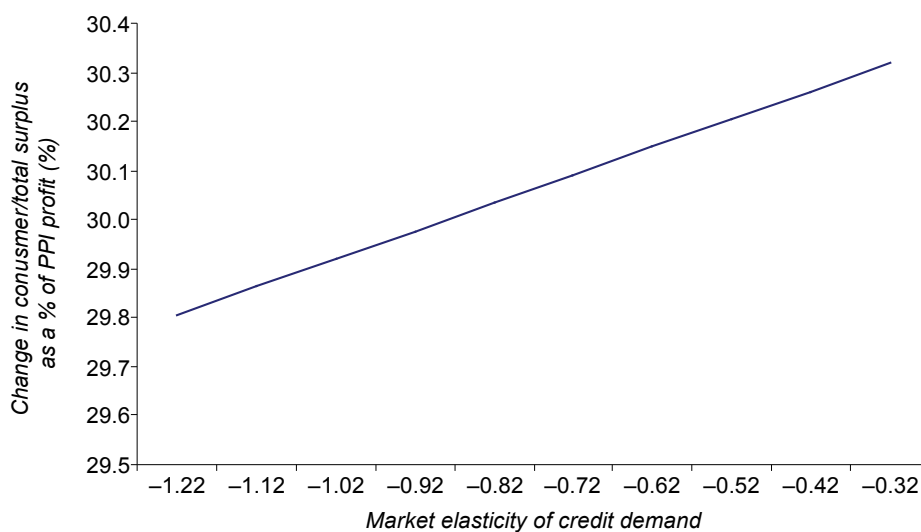


Source: CC analysis.

7. Figure 2 shows the sensitivity of our results to the elasticity of credit demand assumption used in the model. This shows that even under our upper-bound assumption, where the elasticity of credit demand is equal to the elasticity of PPI demand, a non-system remedy results in an increase in total consumer welfare.

FIGURE 2

**The effect of a non-system remedy on consumer and total surplus:
sensitivity of results to 'market elasticity of credit demand' assumption**

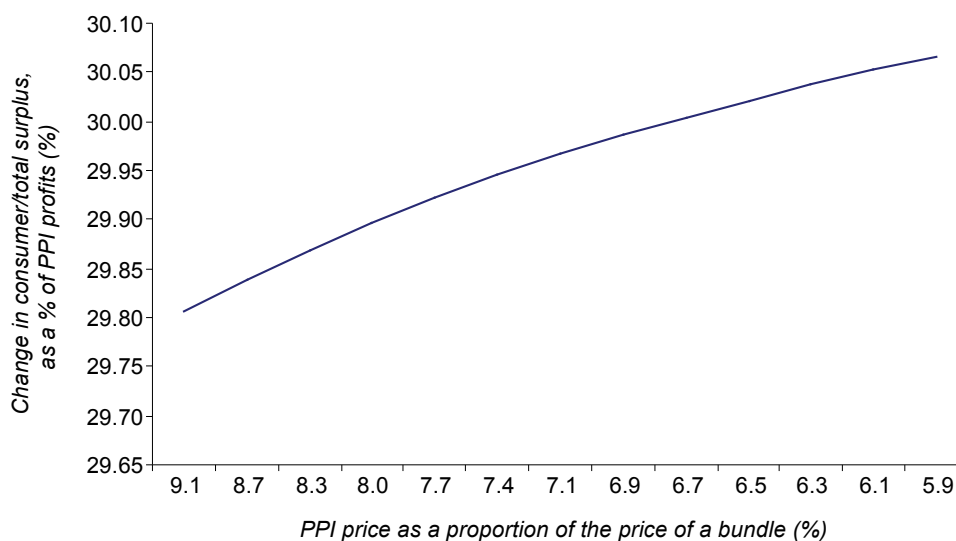


Source: CC analysis.

8. Finally, Figure 3 shows the sensitivity of our results to the assumption regarding the relative size of PPI prices as a proportion of the price of a protected loan. As reported in Table 2 of [Appendix 3.9](#) of the provisional findings, the MPPI forms on average approximately 9 per cent of the price of a protected mortgage. Under any plausible value of this parameter, a non-system remedy will lead to an increase in total consumer surplus.

FIGURE 3

**The effect of a non-system remedy on consumer and total surplus:
sensitivity of results to 'relative price of PPI' assumption**



Source: CC analysis.

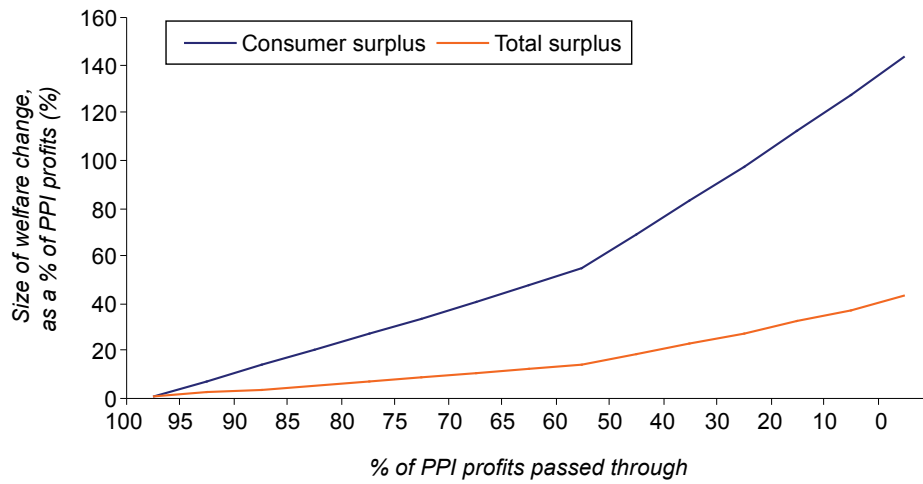
Second-charge mortgages

9. We found that, under any sensible set of values for parameters (i) to (iii) in paragraph 2, a non-system remedy in the markets for SMPPI would result in an increase in total consumer welfare. However, at the extreme of our range, this increase in welfare is small.

10. Figures 4 to 6 show that under any reasonable set of assumptions the imposition of a 'non-system remedy' results in an increase in total consumer welfare.

FIGURE 4

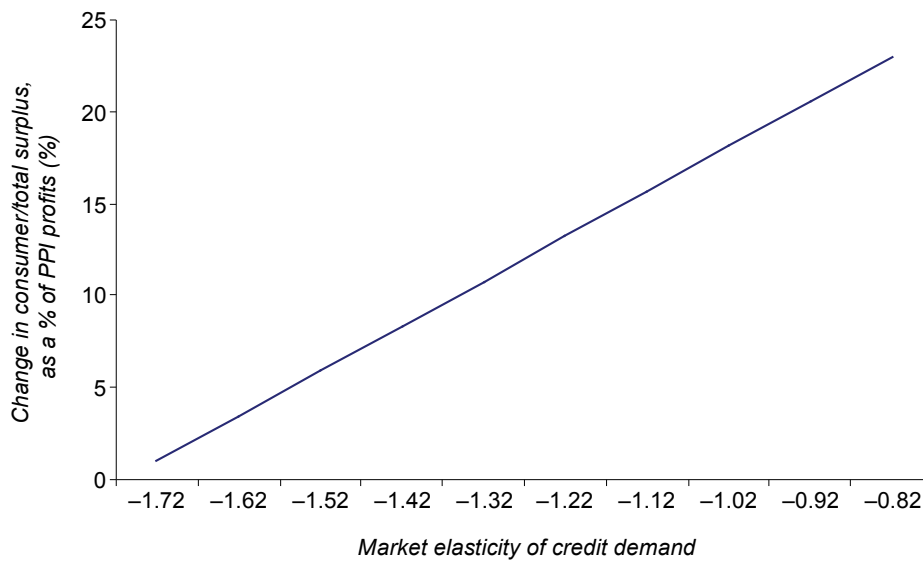
**The effect of a non-system remedy on consumer and total surplus:
sensitivity of results to 'pass-through' assumption**



Source: CC analysis.

FIGURE 5

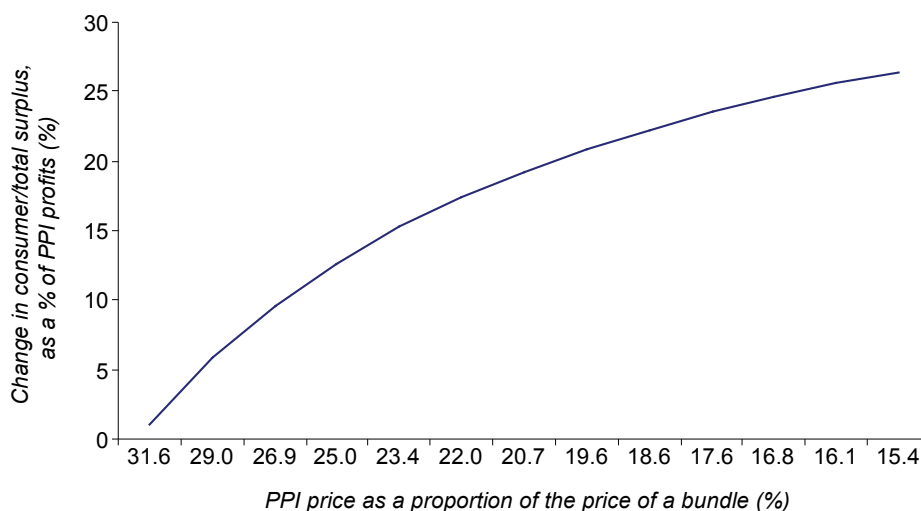
**The effect of a non-system remedy on consumer and total surplus:
sensitivity of results to 'market elasticity of credit demand' assumption**



Source: CC analysis.

FIGURE 6

**The effect of a non-system remedy on consumer and total surplus:
sensitivity of results to 'relative price of PPI' assumption**



Source: CC analysis.

Personal loans

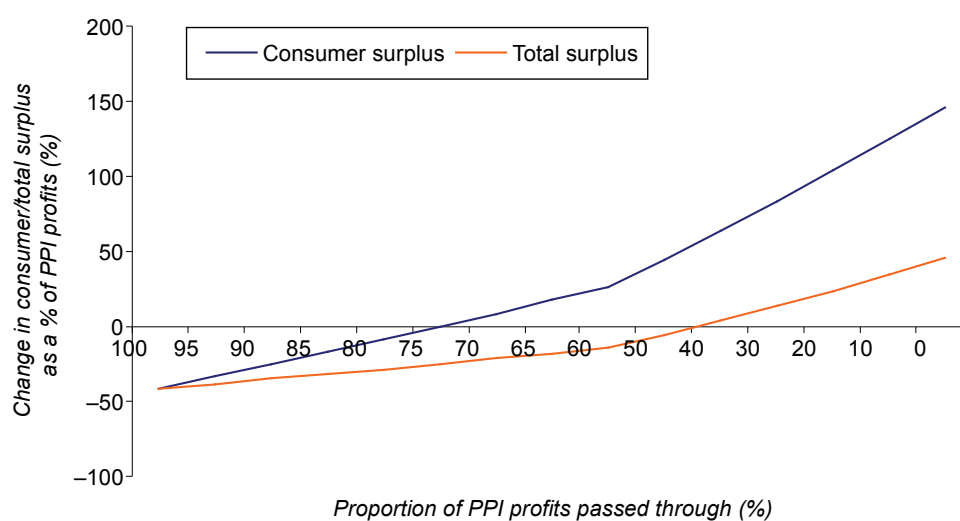
11. For PLPPI, we were unable to exclude the possibility that the introduction of a non-system remedy would reduce total consumer welfare. Within the sensible range of values for parameters (i) to (iii) in paragraph 2 that we tested we found that the imposition of a non-system remedy could either increase or decrease total consumer welfare. In our 'most likely' scenario, there would be a small (most likely positive) change in welfare.
12. We therefore undertook a further modelling exercise to assess the potential effects of a system remedy. We found that under any reasonable set of values for parameters (i) to (iii) in paragraph 2 the imposition of a system remedy would increase total consumer welfare.
13. We set out the results of our analysis of non-system remedy modelling first, and then the results of our system remedy modelling.

Results of non-system remedy modelling

14. Figure 7 illustrates the effects of a non-system remedy in PLPPI under a range of assumptions regarding the PPI profit pass-through rate. Our upper bound to this assumption is 100 per cent, since distributors cannot discount credit prices by more than their PPI profits. If there is strong competition in the credit market, economic theory suggests that this value is likely to be at or near 100 per cent in practice.

FIGURE 7

The effect of a non-system remedy on consumer and total surplus: sensitivity of results to 'pass-through' assumption

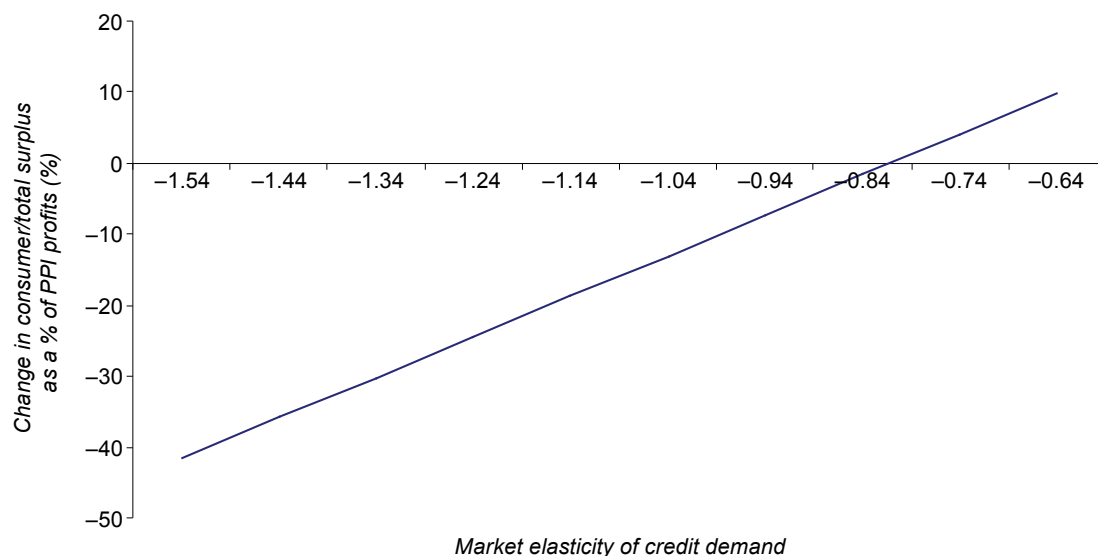


Source: CC analysis.

15. Figure 7 shows that imposing a pure non-system remedy could reduce total consumer welfare, since around our 100 per cent upper bound, post-intervention consumer surplus is lower than consumer surplus pre-intervention.

FIGURE 8

**The effect of a non-system remedy on consumer and total surplus:
sensitivity of results to 'market elasticity of credit demand' assumption**

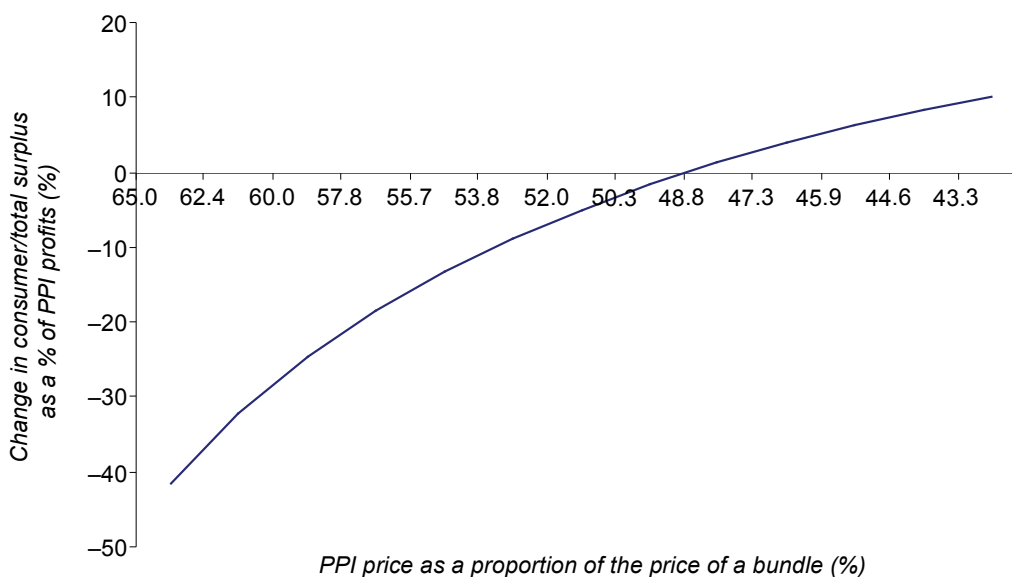


Source: CC analysis.

16. Figure 8 shows that this result applies across a wide range of values of our second key assumption—the value of the market elasticity of credit demand. We consider the upper bound value of the same value as we found for the elasticity of demand for PPI to be generous to the non-intervention view, as there are good economic reasons to suspect that the market elasticity of credit demand to credit prices is lower than the elasticity of PPI demand to PPI prices. However, in the absence of further information we are unable to determine the market elasticity of credit demand.
17. Figure 9 shows the sensitivity of our results to the third key assumption in our model, which is the proportion of the price of a 'bundle' of PPI and credit that is accounted for by PLPPI.

FIGURE 9

**The effect of a non-system remedy on consumer and total surplus:
sensitivity of results to 'relative price of PPI' assumption**

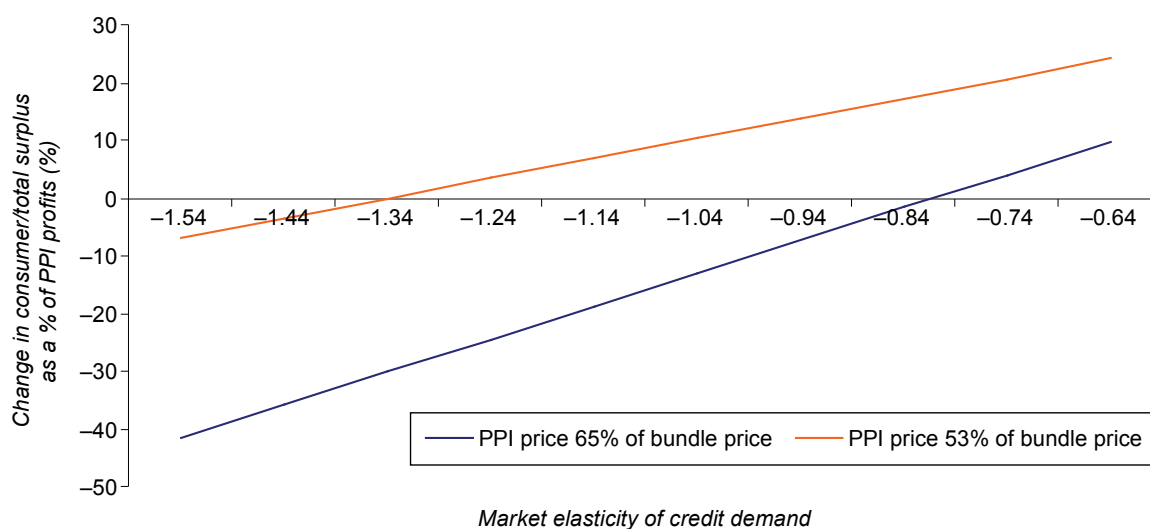


Source: CC analysis.

18. Our data shows that there is a wide range of values seen among providers for this parameter. Some loan and PPI combinations exhibit a ratio of up to 65 per cent. However, the average value, and the value exhibited by the top-selling personal loan products sold by the largest five banks in December 2006, was between 53 and 50 per cent. We therefore define our upper bound as 65 per cent and our most likely value as 53 per cent.
19. Figure 10 shows a repeat of our analysis reported in Figure 8, but includes a second line showing the impact of using the 'most likely' value of the relative price of PPI.

FIGURE 10

**The effect of a non-system remedy on consumer and total surplus:
sensitivity of results to 'market elasticity of credit demand'
assumption under 'most likely' relative PPI price**



Source: CC analysis.

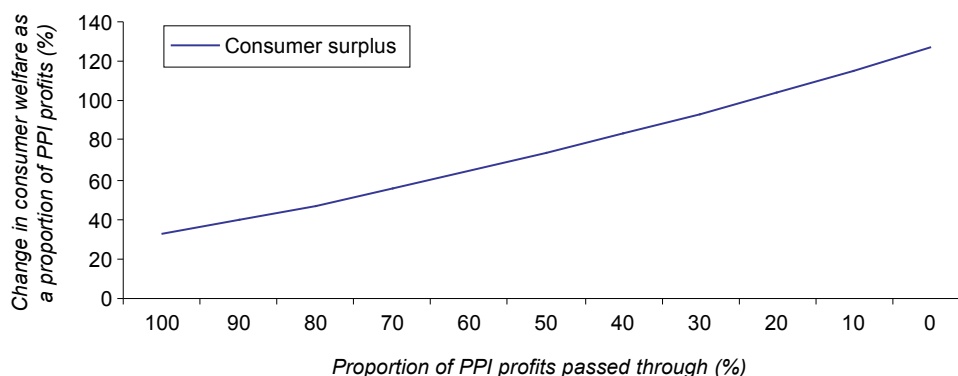
20. When we consider the impact of the market elasticity of demand on total consumer welfare, using both our upper bound and our most likely values of the relative price of PPI, there is a positive case for imposing a non-system remedy in the markets for PPI within a plausible range of assumption values. However, under both our upper bound and our 'most likely' scenarios for the relative price of PPI, we cannot exclude the possibility that imposing a non-system remedy on the markets for PLPPI could reduce overall consumer welfare.

Results of system remedy modelling

21. The results of our system remedy model showed that intervention would lead to an increase in total consumer welfare under any reasonable set of assumptions. Figure 11 shows the results of our 'bound' for a system remedy and the sensitivity of that result to alternative values of the 'PPI profit pass-through' assumption. Figure 11 shows that there is a net increase in total consumer welfare regardless of the proportion of PPI profits passed through prior to intervention.

FIGURE 11

**The effect of a system remedy on consumer surplus:
sensitivity of results to 'pass-through' assumption**



Source: CC analysis.

22. We also found a positive impact on consumer welfare when we tested the sensitivity of our result to the market elasticity of credit demand and the relative price of PPI.
23. Table 1 shows the differences in outcome from our system remedy model and our non-system remedy model respectively, when we use the 'bound' parameters from the non-system remedy modelling. The table shows that for a non-system remedy we cannot exclude the possibility that total consumer welfare may be reduced. The maximum it could reduce, under the most extreme assumptions, is around 41.5 per cent of the excess profit made in PLPPI.¹ However, in our system remedy model we find that there will be an increase in consumer welfare of 32.3 per cent of the excess profits made in the markets for PLPPI.

¹The effects could in practice be larger than this because PPI customers may be more heavily affected by increases in credit prices, and tightening of credit score cut-offs.

TABLE 1 Comparison of non-system 'bound' results for system and non-system remedy models

	<i>System remedy</i>	<i>Non-system remedy</i>
<i>Prices*</i>		
Initial PPI price	0.78	0.78
Initial credit price	0.42	0.42
Initial bundle price	1.20	1.20
Counterfactual PPI price	0.31	0.31
Counterfactual credit price	0.58	0.58
Counterfactual bundle price	0.89	0.89
<i>Sales</i>		
Initial protected advances (£)	340,000	340,000
Initial unprotected advances (£)	660,000	660,000
Initial penetration rate (%)	34	34
Initial total advances (£)	1,000,000	1,000,000
Counterfactual protected advances (£)	474,775	272,497
Counterfactual unprotected advances (£)	274,929	144,063
Counterfactual penetration rate (%)	63.3	65.4
Counterfactual total advances (£)	749,704	416,560
<i>Welfare</i>		
Change in consumer surplus (£)	51,451	-66,032
Value of distortion (initial PPI profit) (£)	159,120	159,120
Relative size of consumer surplus gain/ loss (%)	32.3	-41.5

Source: CC.

*Prices in £ per month for an indicative £100 12-month loan.

Notes:

1. Comparison of 'bound' values—strong assumptions of, for example, 100 per cent pass-through of PLPPI profits into the credit market, relatively high market elasticity of demand for credit.
2. Based on illustrative value of £1,000,000 of loan advances.