

Comment on Response to the “Rose Report” Value of Time and Value of Work Time during Public Holidays by Professor Altman

By Professor John Matthew Rose

1. Professor Altman has argued that the results reported in the Rose Report are potentially biased due to a systemic failure to account for a number of key theories that are fundamental to the theory of behavioural economics. These are, failure to consider/incorporate reference points or anchoring, framing and loss aversion. Professor Altman also suggests that the survey and econometric modelling represented within the Rose Report fail to account for other aspects of behavioural economic theory.
2. It is my opinion that the theories identified by Professor Altman are critical in the current context, and failure to incorporate mechanisms to account for such behaviour are likely to result in systematic biases in the survey results.
3. It is my opinion that Professor Altman has failed to understand the survey, survey process and modelling undertaken, and that the key theories identified by Professor Altman were present and accounted for. As such, it is my opinion that the response by Professor Altman does not detract from the findings related in the Rose Report, but rather strengthens the case presented.
4. The key points identified by Professor Altman and how they are accounted for within the Rose Report are discussed below.

Referencing and anchoring

5. Professor Altman correctly states that choices cannot nor should not be made context free. Discussion of this requirement was made in the original Rose Report on P10.
6. Two reference points were present within the survey itself.
 - a. Respondents were first asked to provide a detailed account of their previous week (i.e., seven days) in terms of the activities they undertook, both work and non-work related. As shown in Figure 1 and discussed in the surrounding text of the Rose Report, under each of the choice tasks respondents were asked to complete, respondents were shown the activity diary that they completed at the beginning of the survey (the diary is blank in the screen captures shown in the report, however these were populated in the survey shown to respondents, as discussed in the text, with the respondents actual activities), and told when making their choices, to assume that their week was exactly the same as shown (which was in bold in text shown to respondents). In this instance, the survey questions were *framed* around their previous week’s activities (i.e., the context of the survey questions was provided to respondents multiple times as the activity diary and text were repeated for each question; see Appendix A).
 - b. As reported in Table 1 and surrounding text of the Rose Report, the experimental design employed in the survey pivoted the hourly pay rates shown to respondents both plus and minus around the current hourly pay rates (including penalty rates where appropriate). For example, as shown in Table 1, for those falling under the Restaurant Industry Award 2010, the hourly pay rates for Sundays were systematically varied over the experiment (both within and between respondents) to take values between \$18.92 and \$35.14 per hour and included a level of \$27.03 per hour which is the current award rate (i.e.,

over the course of the experiment, respondents would have seen the actual current award rates, as well as hourly rates that were both below and above the current award rate). In this way, the current award rate is not only present, but acts as a reference point to respondents who know their current hourly pay rate. Further, the values shown to respondents were pivoted around the current hourly pay rates (including penalty rates) both plus and minus according to the actual pay rate for the day (i.e., ordinary time, weekday, weekend and public holidays; see Table 1). Professor Altman has completely misunderstood the experimental design used within the survey having assumed that respondents were only shown hourly pay rates less than the current rate, and failed to comprehend that **the actual current hourly rates (including penalty rates where appropriate) were used as part of the experiment acting as a reference point for those falling under the two awards.**

7. With regards to point 6a. above, it is common in applied economics fields, such as marketing and transportation, to use previous experiences as the frame in which to conduct a survey (see Rose et al. 2008), as opposed to asking about some 'representative event'. The only assumption is that the previous event (i.e., week in the current context) is representative and not abnormal, which is a justifiable assumption given that random sampling was used in selecting the sample.
8. It is therefore my contention that whilst I agree with Professor Altman that accounting for framing effects and referencing is critical in such surveys, I disagree with his conclusions given that both are present within the experiment.

Loss Aversion

9. Professor Altman has indicated that failure to account for loss aversion in the survey and modelling process may result in systematic biases of any results. It is my contention that loss aversion is accounted for by both the experiment and modelling, and that Professor Altman has demonstrated a failure to understand the survey approach adopted in the Rose Report. As shown in Table 1 of the Rose Report and surrounding text, respondents were shown combinations of potential work shifts in which the hourly pay rates were varied plus or minus around the current relevant hourly pay rate (including penalties). An example of this is given in Figure 6 of the Rose Report, where a respondent under the General Retail Industry Award 2010 was presented with several offers, including an offer to work a 8am to 11am Friday shift at the hourly pay rate of \$23.15 (the current award rate for a Friday) alongside an offer to work a 3pm to 9pm shift at \$20.84 per hour (below the current award rate for a Friday), and a Thursday 2pm to 5pm shift at an hourly rate of \$27.78 per hour (above the award rate).
10. Reading Professor Altman's response to the Rose Report, it is clear that Professor Altman has misunderstood that respondents were given both above and below hourly pay rate offers, and has assumed that respondents were offered only pay rates below the current award rate. Such an assumption by Professor Altman is unfortunate rendering much if not all of his criticism of the approach adopted in the Rose Report null and void.
11. Given that the survey choice tasks respondents were asked to complete involved offers that were both plus and minus the actual current pay rate (including some offers that are the current Award rate), the survey task directly allows for loss aversion.

12. Discrete choice modelling assumes that respondents trade-off the attributes of the alternatives presented to them. The choice tasks over the experiment used in the Rose Report allowed respondents to either reject or accept shifts offered at various times of day and over various days of the week (with reference to the activities of the previous week's activity set for those times and days, hence accounting for referencing and anchoring), with pay offers that were systematically varied around the current appropriate hourly Award pay rate. As such, respondents were able to reject shifts offered at a lower hourly pay rate and substitute these for different shifts offered at a higher hourly pay rate within the choice tasks.
13. The substitution of the acceptance and rejection of shifts is directly accounted for in the correlation structure of the econometric model.
14. It is therefore my opinion that Professor Altman is correct that allowing for such effects is ideal, however I reject his conclusions that the current survey will result in biased outcomes due to failure to account for such behaviour on the grounds that the current study actually does deal with such effects.

Other aspects of Professor Altman's response

15. Professor Altman offers a series of lesser criticisms of the Rose Report. These include failure to consider welfare effects, confounding of reservation wage with willingness to accept (WTA) measures, as well as a number of other lesser criticisms. I address each of these below.

Welfare effects

16. Professor Altman states that the experiment conducted in the Rose Report fails to account for the welfare effects of respondents given a loss of wages. Such criticism is unfounded given the way in which the experiment was conducted. The experiment presented respondents with multiple shift offers over which the hourly pay rates were varied around, plus and minus, the current hourly Award pay rate.
17. As demonstrated in Figure 6 of the Rose report, respondents completing the survey could substitute between shifts with higher, lower, or the same pay rates as the current award rate, by rejecting or accepting any combination of work offers made. The survey itself did not assume that respondents would have to suffer a loss of wages, and indeed, respondents could elect in many choice tasks to work more hours and earn more than their current weekly wage.
18. There was no coercion placed on the respondent to accept or reject a shift, and hence, the respondents themselves can be assumed to account for the welfare impacts of their choices, particularly given how the survey task was framed (i.e., around their previous week).
19. It is my opinion therefore that the issue of welfare effects on respondents undertaking the study is not an issue, as the respondents were able to account for these impacts when making the choices they did.

Reservation Wage and Willingness to Accept

20. Professor Altman states that the Rose Report confounds the issues of the reservation wage with the issue of WTA. Such an assertion is correct, however Professor Altman has failed to understand how WTA is computed in the current study and what the implications are in terms of its construction.

21. The choice tasks of the experiment presented respondents with shifts described by hourly pay rates both greater, the same, and lower than the current award rates. The pay rate values shown were systematically varied via experimental design both between and within individual respondents.
22. The choice task not only varied the hourly pay rates (both plus and minus the current award rate) but also the days the independent shifts were offered, as well as the times and lengths of the individual shifts. Respondents were asked to accept or reject the individual shifts, and could select shifts with higher pay rates (assuming the times and days were also suitable) that had a higher hourly pay rate than the current award rate. The survey tasks therefore involved respondents trading off the attributes of the shifts (time, day, number of hours, and hourly pay rate) to obtain a total weekly pay. Over the games, respondents could choose combinations of shift offers that would allow in some instances a weekly wage greater than their current weekly wage.
23. Professor Altman's assertion that the confounding of the reservation wage with WTA as being problematic is therefore incorrect, as respondents were not coerced into selecting one shift (say on a Sunday) if the offer was not to their liking, given that they could substitute it with one (or all) of the other shifts on offer. It is this failure to understand that despite the shifts shown being independent, the choices of which shift(s) to work is not. Indeed, the assumptions of discrete choice models is that respondents do indeed make such trade-offs, which is supported by the findings of the Rose Report.
24. The fact that the shifts are independent, but the choices of the shifts is accounted for the econometric modelling, via both the correlation structure of the error terms of the shifts (a significant correlation suggests that the choices are not independent, described by Equations 14 to 17) and the way in which the log-likelihood function of the model is set up (i.e., the model calculates the product of the choice probabilities which means that what is being modelled is the sequence of choices that are observed and hence does not treat them as independent).

Distributional effects

25. Professor Altman puts forward the argument that there is a distribution of WTAs over the population, and that working with the average, as done in the Rose Report, does not represent the average in the population. This assertion is demonstrably untrue.
26. As reported in Table 12, the econometric models allowed for WTA heterogeneity over the sample. Random parameters assume certain distributional assumptions where in this case the most common assumption of Normality was assumed. The mean and standard deviation parameters of these distributions are reported in Table 12.
27. Given that the models allow for a normally distributed WTAs, the mean of the WTAs are representative of the population means (a normal distribution is symmetrical). It is not clear why Professor Altman is arguing otherwise. Indeed, the "actual range of values of work time across the sample population" is represented by the estimated distribution, which is given in the report.
28. The Rose Report concentrated on the average WTA, as a normal distribution is unbounded, and hence infinite in both directions. Whilst it is feasible to work out the cumulative probability density function of the WTAs given both the mean and standard deviations of the WTA distributions (which is not the same as a confidence interval as inferred by Professor Altman; one can discuss percentiles, however the

concept of confidence intervals around an unbounded distribution is somewhat problematic), it is worth noting that working with the means of such distributions is accepted practice in most applied economics fields. This however does not negate the fact that the distributions themselves have variance.

29. Hence, whilst it is possible to compute the percentiles of the Normally distributed WTA values, it makes more sense to work with the average values as this may be interpreted as the WTA at which an average worker will accept to work a shift. I do not dispute that some workers would require more, and others less to work certain shifts, however, the model and the experiments account directly for this. Further, it is worth noting that the average WTA for most days/times reflects the real current award rate, providing external validity to the results given the fact that these are the hourly pay rates which the respondents have revealed to accept in real markets.
30. It is possible, though unclear, that Professor Altman is attempting to argue that rather than work with the average WTA, one should instead work with the marginal WTA. Such an argument would suggest that in order to entice all potential workers into the labour market, one should offer the WTA value required to entice the last worker into the labour, not the average WTA value. If this is the argument Professor Altman is offering, then it can be refuted on three grounds. Firstly, the sample of respondents who undertook the experiment reported in the Rose Report are in the labour market at the current wage rate which provides external validity to the findings of the Rose Report, hence the real WTA is either the current wage rate or lower. Secondly, the objective of the Rose Report was to determine the value of time for the population of interest, which is what the reported WTA values represent. The fact that the WTA values reported are distributed Normally over the sampled population, whilst potentially allowing for one to examine the marginal WTA as opposed to the average WTA, does not, nor should not change the objective of the report. Thirdly, the argument for the use of marginal WTA fails to account for demand. For example, if the award rate were set to \$1 million dollars per hour, the supply for labour in the two industries examined would likely be the entire working population of Australia (if not the world, under certain assumptions about the relative wage rates across industries nor remaining constant). However, at that rate, most if not all businesses would be forced to close due to excessive costs (assuming no inflationary pressures exist), and the demand for labour would be zero. A free labour market would be expected to operate as any other economic market, with the wage rate being determined as the equilibrium point between labour supply and labour demand. Assuming the wage rate should be set at the marginal WTA value whilst ignoring labour demand is therefore a nonsensical proposition.
31. The finding that the WTA for Sunday work is lower than the current award rates, and hence is biased, does not follow. Respondents were shown Sunday hourly rates both above and below the current award rate, and could have chosen to select shifts over the experiment that were the same or above the current Award rates. The results of the study demonstrate that they did not, choosing to work shifts at a lower hourly rate than allowed for under the current award rate. Again, the experiment was set up so that respondents could choose to work for more on other days of the week, and hence there is no reason for respondents to select lower hourly rates on Sundays other than they are willing to accept a lower hourly rate for working on Sundays.

Assumptions about working on Sundays

32. Professor Altman states that the Rose Report assumes that working on Sundays does not hold any particular importance to the population of interest and quotes out of context a motivating sentence in the introduction of the report. Professor Altman is correct that there is an assumption made that Sunday is no more or less important insofar as the survey shown to respondents made no assumptions about the importance or otherwise of working any days of the week.
33. The survey instrument, screen captures of which are given in Appendix A of the Rose Report, clearly show that respondents were given no instructions about working on weekdays or weekends. The experiment itself simply provided respondents with several offers to work shifts which were experimentally distributed across the week (weekdays and weekends). No importance was suggested anywhere to respondents undertaking the survey about working on any particular day of the week (Sunday or otherwise), with respondents free to choose to accept/reject the offers provided without any prompting.
34. It is not clear why a motivating statement in a report written after the survey was conducted, a statement that did not appear in the survey shown to respondents in any way, shape or form, could possibly bias their responses to the survey task undertaken.

Coercion verses voluntary choices

35. Professor Altman states that the survey task failed to account for coercion when computing the WTA for pay rates. This is correct.
36. Choice modelling requires that respondents make trade-offs between the attributes of alternatives. In cases where respondents are forced to make choices by some exogenous agent, then no trade-offs are made, as the choice is no longer formally a choice.
37. Nevertheless, the WTA for working coerced hours whilst incompatible with choice modelling, is meaningless. The WTA, as shown in Equation (18) of the Rose Report, is the marginal rate of substitution between one variable and price/cost/pay, which is computed as the derivatives of the relevant parameters from the model being estimated (see Section 5.3.1.3 of the Rose Report). In the current context, this implies that economic agents are willing to trade time for pay in order to have a net change in utility of zero (i.e., they are indifferent between the previous scenario and the new scenario on offer). If no such trade-off is allowed, then by definition, WTA does not exist.
38. Professor Altman suggests that a method known as Contingent Valuation be employed to compute the WTA rather than choice modelling. As outlined in the Rose Report (page 8),

“Whilst other stated preference methods exist, such as contingent valuation (CV), the use of DCE data remains the preferred approach time (e.g., the Copyright Tribunal, in relation to proceedings pursuant to section 157B of the Copyright Act 1967, examined alternative methods to value music in fitness centres, including DCEs and CV. As part of the proceedings, the Tribunal ruled that DCEs were the most appropriate method to use in valuing typically non-traded goods. See Phonographic Performance Company of Australia Limited 2010), capable of providing disaggregated estimates of marginal rates of substitution, such as the value of.”

39. Aside from the ruling of the Copyright Tribunal, I would argue that the use of CV in this respect will result in biased answers, as the true choice being made in cases involving coerced working hours is not how much one values an hour, but how much one values the current work environment, as electing not to work the coerced hour would be akin to resigning from the job, and hence forfeiting the entire weekly wage, not just the hours that one is being forced to work.
40. This is a very different question and beyond the scope of the current work which is simply to derive the WTA for work relative to the current award rates.

Pareto Optimality

41. The experiment itself involved showing respondents choice tasks consisting of several independent shifts where each shift was represented by an hourly wage rate offer the same, less, or greater than the current award rate. As such, in many of the tasks shown, respondents could choose shifts at a higher than current award rate so that their weekly wage is greater already being overcompensated relative to their current situation, and in others, they might have for example been faced with the choice of a reduced Sunday rate (noting this is an example only, and one can substitute any day here) in the afternoon with a Monday (or any other rate, including a different Sunday shift – say in the morning) at a higher rate. As such, whilst the welfare aspects identified by Professor Altman are not directly part of the report, they are actually controlled for by the experimental design.
42. The survey and model results are therefore perfectly consistent with Pareto optimality as the survey design allows for such an outcome to be revealed. The argument that the survey task does not allow for welfare to be reset is incorrect, given that the trade-off nature of the experiment is designed to precisely do this is therefore incorrect. Further, WTA by definition is precisely the definition offered by Professor Altman in his report, that is, how much of one attribute (time) would an economic agent be willing to give up (accept) if they had to accept (or give up) something else (money/pay) and have a net change in utility of zero.

Biases and stated preference experiments

43. Professor Altman raises the issue of biases in stated choice experiments. Such biases are known within the literature as hypothetical bias.
44. In the absence of revealed preference (real market data), unless one is able to perform field or laboratory experiments, aside from benefit transfer methods, the only mechanism capable of eliciting preferences is to use stated preference techniques. In the current context, it is not possible to construct markets in which the award rates are actually allowed to vary less than the award rate due to legal restrictions. Benefit transfer implies taking the results from one market and superimposing those on other markets. In the current context, this would suggest taking the results of the labour market from another country with lower hourly pay rates than in Australia (such as the US) and extrapolating these to the Australian context. This is not feasible given cost of living differences, and the reliance on tipping in the US. This suggests that one is left with stated preference methods as the only possible means to explore the issue of WTA for hourly pay rates in Australia.
45. Evidence suggests that making stated choice experiments more realistic by accounting for referencing, anchoring, and framing can reduce any hypothetical bias that might be present (see e.g., Collins et al. 2013, Fifer et al. 2011, Hensher 2010 and Rose et al.

2008 for a review of this literature). As argued above, all of these factors were directly accounted for in the survey experiment.

46. The evidence, whilst mixed, suggests that any bias in stated choice experiments is for WTP/WTA to be biased upwards (see for example, Brownstone and Small 2005 and Wardman 2001). In the current context, where the hourly pay rates respondents were presented with were varied both plus and minus around the current award rate, any bias is likely to be for respondents to choose shifts with higher hourly pay rates rather than less, which would be more aligned with their strategic interests. As such, if the WTA values do suffer from any hypothetical bias, the bias is most likely to be such that the values reported are higher than the true WTA values in the population at large, not lower. This is because it would be in the respondents' strategic interest to select shifts in the experiment with hourly pay rates greater than the award, not shifts with lower hourly pay rates.
47. Whether bias exists or not is an empirical issue and not one that can be detected after the fact. That said, as per 45 above, the survey task adopted within the Rose Report made use of the latest methods to reduce if not eliminate hypothetical bias within the data.

Conclusion

48. Professor Altman has described several aspects of what constitutes behavioural economics as a coherent theory. He has argued that failure to account for these invalidates the results reported in the Rose Report.
49. It is my opinion that Professor Altman is correct that failure to account for these behaviours will likely result in biases (it is an empirical issue, so one can never be sure).
50. It is my contention however that all of the effects suggested by Professor Altman were accounted for in the survey tasks undertaken by the sample of respondents, and hence whilst I share Professor Altman's views on behavioural economics, I refute his conclusions as related to the current study.
51. Indeed, it is my view that Professor Altman's report actually supports the approach adopted in the Rose Report, and hence rather than detracting from the results, strengthens the case put forward by Rose.

References

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