We would like to thank for the comments and notice that neither of the referees have expressed concern with respect to style, readability and the like. For this reason we will not suggest fundamental changes to the paper.

One referee observes that it is too difficult to compare our results with the initial results provided by Day et al. and Arzac, and, secondly, that the paper will improve if there is more intuition. Below under the heading “suggested changes” we propose changes to the paper that aim at improving the paper on these two specific points. The suggested changes answer the specific points mentioned in the second referee report. Before we give our suggestions a few remarks on the referees’ observations are in order.

It is suggested that the differences between our results and the results in Day et al. and Arzac are mainly attributable to the specification we choose. On this point, please, notice that if one uses our specification in Arzac, the result is that a decrease in output implies a decrease in profit’s variance—thus the differences are not due to the specification. The main difference between the results is explained by the way the monopolist’s choice variable affects the variance of profit. Under pre-commitment to output, variance goes up as the firm pre-commits to more output (at least in what Arzac terms the main/normal case which is $h(x) + xh'(x) > 0$, Arzac page 165). Under pre-commitment to price, variance goes up when the announced price goes up (at least in our specification). If we change our specification of costs to a general cost function it is not clear that a higher price leads to more variance. This depends on the properties of the cost function. Under the assumption that the increase in the variance of revenue dominates a possible decrease in the variance of cost our result still applies (Proposition 2 actually covers this). Our specification implies that an increase in price increases profit's variance.

It is also mentioned that it is unclear why a tax leaves the firm's decision unchanged under pre-commitment to quantity while it affects price under pre-commitment to price. The explanation for this is, under pre-commitment to quantity, that a change in the tax has no effect on profit's variance because cost does not contribute to variance. Oppositely so in the case of pre-commitment to price. Here a change of the unit tax rate implies a change in profit's variance because it changes the variance of costs.

To sum up: the differences between our results and the results of earlier work are explained by the way decision variables (quantity versus price) affect profit's variance. This also goes for the intuition. The suggested changes given below hopefully make this clear in addition to answering each of the specific points mentioned be referee number two.

Suggested changes (highlighted in yellow).

Page 6: Text after equation (1) is changed to:

Here θ is a continuous stochastic variable with an expected value of zero and a variance of ${\sigma_\theta}^2$. Although the monopolist knows the distributional properties of θ, she is ignorant about the exact realisation of the stochastic variable when she sets price. Following, say, Brown and Johnson (1969) the demand function under conditions of uncertainty is in general given by $\tilde{x}(p, \theta)$ where actual demand is thus determined by the announced price and conditions not known to the firm when the price is set (for example the business cycle, change in taste, emergence of competing products). In the literature there is particular interest in the additive and multiplicative varieties of $\tilde{x}(p, \theta)$. We use the additive variety and a change in the additive component of demand is a change in willingness to pay, while a change in the number of consumers corresponds to a demand change by rotation. Under additive uncertainty, for a given price, the monopolist's prediction of sale is equally accurate across the realisations of the stochastic innovation. NOTE 4 UNCHANGED

For simplicity, we focus on a production technology of the type where there is a fixed cost, called F, and constant marginal cost called c. That is, the firm's production cost is:

New reference to be added: Brown, G. and M.B. Johnson, 1969, Public Utility Pricing and Output Under Risk, American Economic Review, 59(1), pages 119-128.

Page 10: Text after proposition 2 is changed to:

As noted, Day et al (1971) and Arzac (1976) analyse the behaviour of a quantity-setting monopolist under demand fluctuation. They show that the monopolist minimises the risk of negative profits by reducing output to below the output that maximises expected profit. Following Arzac (1976) the monopolist chooses output under a demand function that is of the form $p(x, \theta) = g(x) + \theta h(x)$, where $E(\theta) = 1$ and $g'(x) + h'(x) < 0$. Setting the quantity, the firm accepts uncertainty with respect to revenue but production costs are the same irrespective of the shock. Thus, the variance of profit is ${\sigma_{\pi(x)}}^2 = \left(xh(x)\right)^2 {\sigma_\theta}^2$. Under the assumption that $h(x) + xh'(x)$ is strictly positive, the monopolist reduces the variance of profit by reducing output. The difference between this result and Propositions 1 and 2 derives from the way decisions affect profit variability. Suppose the monopolistic firm considers changing from setting output to setting a price so that the relationship between price and quantity is given by the average demand curve. Under preset quantity there is uncertainty with respect to revenue and setting price adds uncertainty since there is also cost uncertainty. New note here

New note: Day et al. (1971) and Arzac (1976) show results for a cost function of the form $c(x) + F$ and their results therefore apply to $cx + F$ as a special case. Our proposition 2 covers the case of $c(x) + F$.

Top page 13:

It is well known that under linear demand, an increase of the fixed marginal cost increases the price by fifty percent of the cost increase when the monopolist maximises expected profit. In contrast, when optimal pricing follows the safety-first criterion we have:

$$ {dp^*}/{dc} = \left((p^* - c)^3 2F - f''(p^*)\right)^{-1} (p^* - c)^3 2F. \tag{10} $$

Equation (10) shows, in the case of linear demand, that the final price changes one-to-one with a change in the constant marginal cost. When demand is convex, it is evident that the pass-through rate of marginal cost increases is more than a hundred percent. To expand on the intuition why the safety-first principle suggests (relatively speaking) strong price-responses to changes in the fixed marginal cost, notice that, under the safety first principle, the monopolist is concerned with the difference between expected sale and expected zero profit sale. Under linear demand and cost, the change in expected sale following a price change is just the slope of the demand curve. Thus, adjusting the price on a one-to-one basis to cost leaves the equality between expected sale and expected zero profit sale intact. In contrast, a monopolist maximising expected profits realises that increasing price on a one-to-one basis to cost reduces marginal revenue by more than it reduces marginal cost showing that the price increase is less strong.

This observation has implications for analysis of tax incidence. Under an excise tax with a tax rate of t, the first-order condition in equation (8) modifies to $(p-c-t)f'(p)+(p-c-t)^{-1}F=0$ which (we assume) solves for $p^*(t)$ when the corresponding second-order condition is met. In this case, $dp^*(t)/dt > 1$ when demand is convex. Note 7 changed New note a here The fact that the tax pass-through exceeds unity might imply that an increase of the tax rate increases the monopolist's expected profit. In fact, under a linear demand curve we have (which is proved in the Appendix): New note b here

New note 7: We have $dp^*(t)/dt = \Lambda_{pp}{}^{-1}\left(f'\left(p^*(t)\right)+(p^*(t)-c-t)^{-2}F\right)$, where $\Lambda_{pp} = 2f'\left(p^*(t)\right)+(p^*(t)-c-t)^{-2}f'^*\left(p^*(t)\right) < 0$ is the second-order condition after rewriting by use of the first-order condition. $\Lambda_{pp} < 0$ when the demand curve is not "too curvy."

New note a: We can compare, under the assumption of normally distributed profits, to the situation where the monopolist maximises the expected utility of profits by maximising $E\big(U(\pi)\big) = E(\pi) - \beta VAR(\pi)$, where β reflects the monopolist's attitude to risk. When $\Lambda_{pp} < 0$ is the second order condition we have $dp^*(t)/dt = \Lambda_{pp}{}^{-1}(1 - 2\beta\sigma_\theta)$. Thus, $dp^*(t)/dt > 1$ when $0 > \Lambda_{pp} > (1 - 2\beta\sigma_\theta)$.

New note b: Some manipulations show that Proposition 4 is consistent with second order conditions when ½$\xi\big(p^*(t)\big) < \mu\big(p^*(t)\big) <$ ½$(p^*(t) - c - t)\xi\big(p^*(t)\big)$.

Page 13-14: Text after Proposition 4 changes to:

Proposition 4 summarises the conditions that give rise to profit-increasing taxes. The existence of profit-increasing taxation owes to the fact that the firm, when trying to avoid a dread event, sets a price that is lower than the price that maximises expected profit. Notice in passing that Proposition 4 reflects a difference between a quantity and a price-setting monopolist. When the monopolist sets price before observing demand, demand uncertainty implies cost uncertainty. Therefore, the unit tax affects pricing because it affects profit's variance. As explained, when the monopolist sets quantity as in Day et al. (1971) and Arzac (1976) the introduction of a tax does not change profit's variance and the firm's decision is unchanged.

Because the tax drives up the price, there is a beneficial profit effect of taxation. When this effect is sufficiently strong, profits go up. Broadly speaking, this happens when the elasticity of $f(p)$

exceeds the elasticity of $f'(p)$ to a sufficient degree, or when the graph of $f(p)$ is sufficiently curvy (evaluated at $p^*(t)$). This means that the price can increase a lot, comparatively speaking, without strong negative effects on sale. However, an increase of the tax rate increases the likelihood of negative profits. This follows since the tax's effect through the price cancels due to the first order condition leaving only the direct negative effect on the firm's cost. New note here

New note: Differentiate $f(p) - (p - c - t)^{-1}F$ with respect to the tax rate to get $d(f(p) - (p - c - t)^{-1}F)/dt = -2F/(p - c - t)^{-2} < 0.$

Page 16: Text just before figure 1 is changed to:

We shall mention that Andersen and Nielsen (2013) show that inelastic pricing is consistent with the behaviour of a risk averse monopolist who maximises the expected utility of profit. When comparing the two results it must be noted that the safety-first principle and expected utility maximisation are not consistent. Nevertheless, the two approaches share qualitatively the result on pricing. However, the comparative statics differ since Andersen and Nielsen (2013) report that an increase of the fixed cost drives down the price. Oppositely, we show that the price goes up as the fixed cost goes up—in agreement with Kahneman and Tversky (1979) who suggest that risk becomes more acceptable as gains become less likely.