

September 2, 2019

Corrigendum

Subject: Thesis submitted for the degree of *Master en sciences économiques, orientation générale, à finalité spécialisée*

The following corrections are made to the document submitted as thesis *for the degree of Master en sciences économiques, orientation générale, à finalité spécialisée*:

- 1) On page 1, the abstract paragraph 3
Previous:

The findings contribute to the existing literature illustrating a large extent of inconsistencies. Despite that, they lead to similar outcomes in different scenarios, which allows methodological comparison. In conclusion, two facts influence the magnitude of the differences. First, a positive correlation with income for a big group of observations: the higher the income, the greater the inconsistency. Second, the exclusion of some variables from the regression increases the weight of non-income variables in the estimated WTP.

Are replaced by the following:

The findings contribute to the existing literature illustrating a large extent of inconsistencies. Despite that, they lead to similar outcomes in different scenarios, which allows methodological comparison. In conclusion, two facts influence the magnitude of the differences. First, a positive correlation with income for a big group of observations: the higher the income, the greater the inconsistency. Second, the exclusion of some variables from the regression decreases the weight of non-income variables in the estimated WTP.

- 2) From the last paragraph on page 13 to figure 7 on page 15.
Previous:

For the 3 regressions with Box-Cox transformations, λ^y is around -0.21. So, from equation [10](#) the ratio between $\lambda^y(\beta^h + \Lambda^h)$ and $(\theta + \Lambda^y)$ is negative, it works as a discount factor of income. When $H=1$, regression (5), the discount factor is larger for 2,302 individuals, due to a greater $(\beta^h + \Lambda^h)$. So, the equivalent income (equation [10](#)) generated with 1 sub dimension is smaller than when using 5 sub dimensions. In the context of WTP (equation [12](#)), the latter implies that only when using general health as dimension it is possible to achieve a higher estimation

$WTP^{(5)} > WTP^{(2)}$. Having defined the inconsistencies as the difference retrieved and stated WTP in absolute terms, namely $I^{(5)} = |WTP^{(5)} - WTP^P|$ and $I^{(2)} = |WTP^{(2)} - WTP^P|$, which is greater depends on:

$$\begin{aligned} \text{If } WTP^{(5)} - \frac{WTP^P}{2} &= WTP^{(2)} - \frac{WTP^P}{2} & \rightarrow I^5 &= I^2 \\ \text{If } WTP^{(5)} - \frac{WTP^P}{2} &> WTP^{(2)} - \frac{WTP^P}{2} & \rightarrow I^5 &> I^2 \\ \text{If } WTP^{(5)} - \frac{WTP^P}{2} &< WTP^{(2)} - \frac{WTP^P}{2} & \rightarrow I^5 &< I^2 \end{aligned} \quad (13)$$

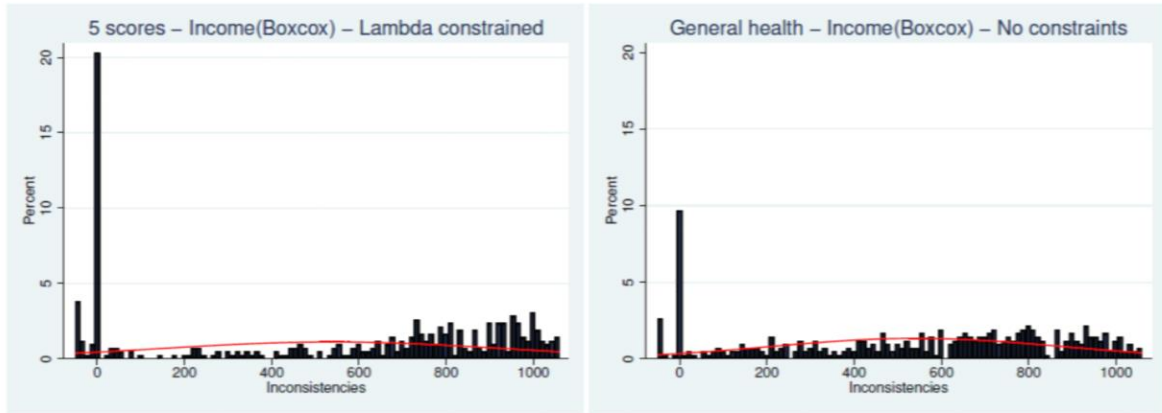
Re stated in terms of the stated WTP, WTP^P it is:

$$\begin{aligned} \text{If } WTP^P &= WTP^{(5)} - \frac{|WTP^{(5)} - WTP^{(2)}|}{2} & \rightarrow I^5 &= I^2 \\ \text{If } WTP^P &> WTP^{(5)} - \frac{|WTP^{(5)} - WTP^{(2)}|}{2} & \rightarrow I^5 &< I^2 \\ \text{If } WTP^P &< WTP^{(5)} - \frac{|WTP^{(5)} - WTP^{(2)}|}{2} & \rightarrow I^5 &> I^2 \end{aligned} \quad (14)$$

In other words the smaller the WTP^P , the more likely it is to get smaller inconsistencies with scenario (2). And the greater the WTP^P , scenario (5) approaches better. To prove this point figure 6 illustrates the histogram of the inconsistencies for the first quintile of income, if WTP is smaller than 64 euros (number randomly chosen). When 5 scores are used more than 20% of the inconsistencies are 0, whereas using only general health results in less than 10%.

Furthermore, in the satisfaction equation methodology, equivalent income is a function of income, with domain $[0, 26,000]$, while the stated value fluctuates between 0 and 2,000 euros. To put

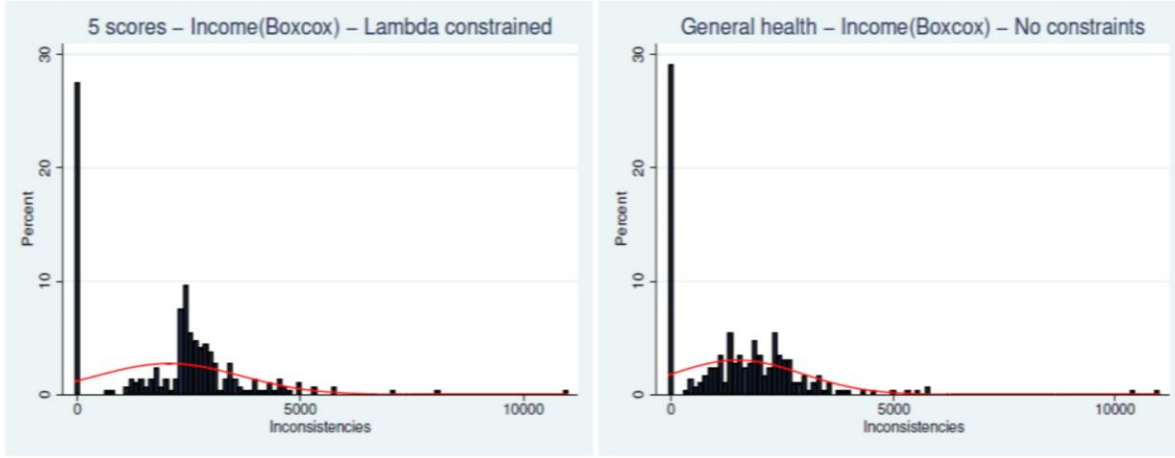
Figure 6: Distribution of the inconsistencies in the first quintile of income for scenario 2 and 5



Source: Own elaboration

it differently, after a certain threshold, the larger the income, the larger the inconsistencies relatively to their size with small income. Moreover, a greater estimation of WTP reduces the inconsistencies. This allows to conclude that regression (5) (only using general health as dimension) results in better estimation of WTP answers, even though the explanatory power in

Figure 7: Distribution of the inconsistencies in the fifth quintile of income for scenario 2 and 5



Source: Own elaboration

Are replaced by the following:

For the 3 regressions with Box-Cox transformations, λ^y is around -0.21. So, from equation 10 the ratio between $\lambda^y(\beta^h + \Lambda^h)$ and $(\theta + \Lambda^y)$ is negative. Together with the difference between current and ideal state, they work as a discount factor of income (this later one is also negative). When $H=1$, regression (5), the discount factor is smaller for 2,205 individuals, due to a smaller $(\beta^h + \Lambda^h)$. So, the equivalent income (equation 10) generated with 1 sub dimension is greater than when using 5 sub dimensions. In the context of WTP (equation 12), the latter implies

that only when using general health as dimension it is possible to achieve a smaller estimation of WTP, $WTP^{(5)} < WTP^{(2)}$.

Here, the statistics are not presented in absolute value, to know in how many cases the stated WTP is larger than the estimated value. Nevertheless, to analyze their extent they are defined as: $I^{(5)} = |WTP^{(5)} - WTP^P|$ for scenario (5) and $I^{(2)} = |WTP^{(2)} - WTP^P|$ for (2), which is greater depends on:

$$\begin{aligned}
 \text{If } |WTP^{(5)} - WTP^P| &= |WTP^{(2)} - WTP^P| & \longrightarrow & I^5 = I^2 \\
 \text{If } |WTP^{(5)} - WTP^P| &> |WTP^{(2)} - WTP^P| & \longrightarrow & I^5 > I^2 \\
 \text{If } |WTP^{(5)} - WTP^P| &< |WTP^{(2)} - WTP^P| & \longrightarrow & I^5 < I^2
 \end{aligned} \tag{13}$$

Re stated in terms of the stated WTP, WTP^P it is:

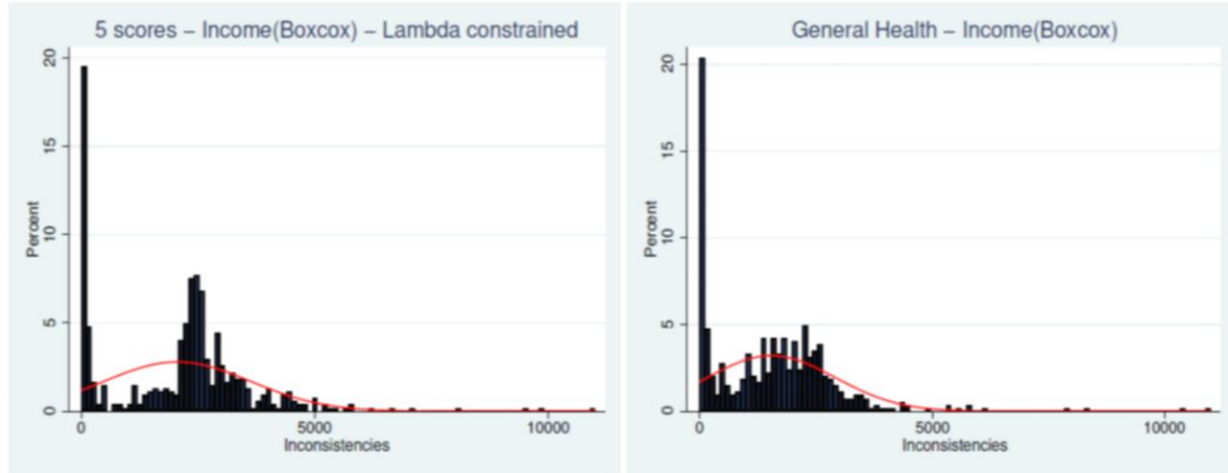
$$\begin{aligned}
\text{If } WTP^P &= WTP^{(2)} - \frac{|WTP^{(5)} - WTP^{(2)}|}{2} & \longrightarrow & I^5 = I^2 \\
\text{If } WTP^P &> WTP^{(2)} - \frac{|WTP^{(5)} - WTP^{(2)}|}{2} & \longrightarrow & I^5 > I^2 \\
\text{If } WTP^P &< WTP^{(2)} - \frac{|WTP^{(5)} - WTP^{(2)}|}{2} & \longrightarrow & I^5 < I^2
\end{aligned} \tag{14}$$

In other words, the greater the WTP^P , the more likely it is to get smaller inconsistencies with scenario (2). And the smaller the WTP^P , the better scenario (5). Here, the average WTP is 85 which is small in comparison with the average estimated WTP (between 1,072 and 1,262 euros).

Furthermore, in satisfaction equation methodology, equivalent income is a function of the transformed income, while the estimated WTP is the difference between income (with no transformation) and equivalent income. The domain of income is $[0, 26,000]$, while the stated value

fluctuates between 0 and 2,000 euros. To put it differently, after a certain threshold, the larger the income, the larger the inconsistencies relatively to their size with small income (see figure 3). Moreover, a smaller estimation of WTP reduces the inconsistencies. This allows to conclude that regression (5) (only using general health as dimension) results in better estimation of WTP answers, when income is large, even though the explanatory power in terms of R^2 is smaller. To illustrate this point figure 6 depicts the inconsistencies in the fifth quintile of income. It can be noticed that for regression 5, the values are closer to 0.

Figure 6: Distribution of the inconsistencies in the fifth quintile of income for scenario 2 and 5

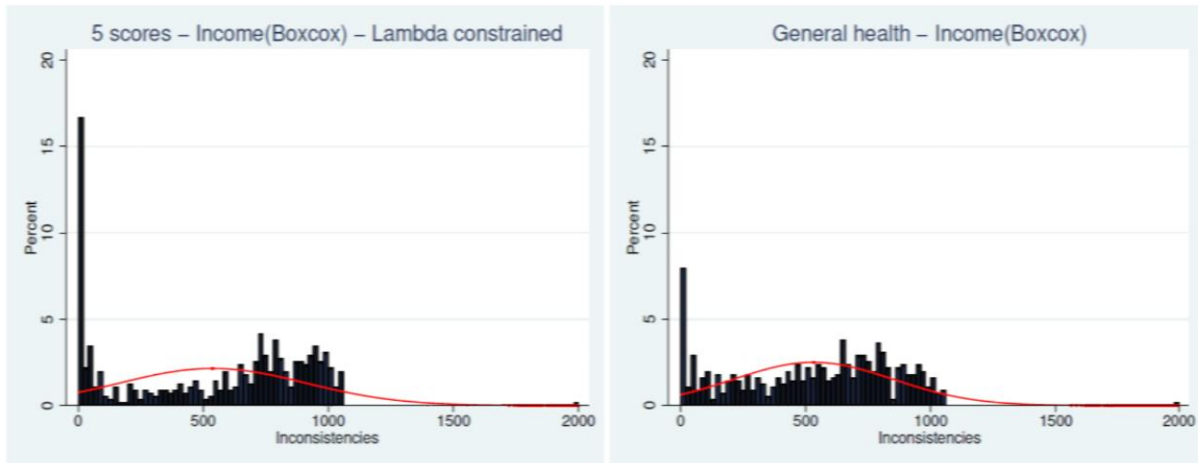


Source: Own elaboration

On the other hand, when income is small, a smaller estimation of WTP can lead to larger inconsistencies. To explain this, the computation of the inconsistencies are restated in terms of equivalent income, $I = |y_i - y_i^* - WTP^P|$. As $WTP^5 < WTP^2$, implies $y_i^{*5} > y_i^{*2}$. Then, before writing it formally, let's put it in a simple example. Given a $y_i = 100$, $y_i^{*5} = 3$, $y_i^{*2} = 2$ and $WTP^P = 8$, the inconsistency for scenario (2) is 91 and for (5) is 89, in coherence with the paragraph above. But, if $y_i = 10$, the inconsistencies are 1 and -1, which are equal in absolute terms. Finally, if $y_i = 9$, they are 0 and -2, respectively. Hence, $I^5 > I^2$.

So, if $|y_i^{*5} - y_i^{*2}|$ is equal to $y_i - WTP^P$, the inconsistencies are equal. As, $y_i^{*5} > y_i^{*2}$, the absolute value can be removed. So, with all the components fixed, except y_i , the smallest the income, the more likely to get a larger inconsistency with scenario (5) than (2). Figure 7 illustrates the histogram of the inconsistencies for the first quintile of income. When 5 scores (scenario 2) are used more than 15% of the inconsistencies are 0, whereas using only general health results in less than 10%.

Figure 7: Distribution of the inconsistencies in the first quintile of income for scenario 2 and 5



Source: Own elaboration

- 3) On page 22, the first paragraph of section: regularities in the inconsistencies.
Previous:

4.5 Regularities in the inconsistencies

To characterize the inconsistencies in coherence with the previous findings, a dummy variable was created. If the inconsistency in (5) is smaller than in (2), the dummy takes the value of 1, indicating that (5) should be used. Otherwise is (2), and the dummy is 0. In that sense this chapter uses the preferences retrieved from the scenario with 5 sub dimensions for 697 individuals and the scenario with only general health for the 2,186. Computing the inconsistency as the difference between WTP from satisfaction data minus the stated WTP and the dummy, the smallest inconsistency is chosen per individual. The inconsistency can be positive or negative. The value 0, is the most frequent value. It is in the second decile of the distribution, as expected given the right-skewed.

Are replaced by the following:

4.5 Regularities in the inconsistencies

To characterize the inconsistencies in coherence with the previous findings, a dummy variable was created. If the inconsistency in (5) is smaller than in (2), the dummy takes the value of 1, indicating that (5) should be used. Otherwise is (2), and the dummy is 0. In that sense this chapter uses the preferences retrieved from the scenario with 5 sub dimensions for 668 individuals and the scenario with only general health for the 2,215. Computing the inconsistency as the difference between WTP from satisfaction data minus the stated WTP and the dummy, the smallest inconsistency is chosen per individual. The inconsistency can be positive or negative. The value 0, is the most frequent value. It is in the second decile of the distribution, as expected given the right-skewed.

4) Section: Conclusions, on page 25, the first paragraph.

Previous:

In all at all, there are some methodological facts that make the inconsistencies smaller. The inclusion or exclusion of variables does not change much the value of lambda, which makes it robust to the model. Nonetheless, this changes the weight of the coefficients in the regression, which also affects the inconsistencies of preferences. In this exercise, using only one dimension yielded in a higher coefficient for the non-income dimension, increasing the substitution between income and health. This gave a smaller equivalent income, which was good when income was large. But, as preferences are convex, if income is small, the effect over the estimated equivalent income is larger than when income is large, and a larger estimation of WTP gives larger inconsistencies. In this case the model with 5 dimensions estimates a larger equivalent income, approaching better WTP.

Are replaced by the following:

In all at all, there are some methodological facts that make the inconsistencies smaller. The inclusion or exclusion of variables does not change much the value of lambda, which makes it robust to the model. Nonetheless, this changes the weight of the coefficients in the regression, which also affects the inconsistencies of preferences. In this exercise, using only one dimension yielded in a smaller coefficient for the non-income dimension, decreasing the substitution between income and health. This gave a larger equivalent income, which was good when income was large. But, as preferences are convex, if income is small, the effect over the estimated equivalent income is larger than when income is large, and a smaller estimation of WTP gives larger inconsistencies. In this case the model with 5 dimensions estimates a smaller equivalent income, approaching better WTP.