Technical Appendix

*Low income:*

*Men*

$$y\_{t}=ωS\_{16}+\frac{(1-θ\_{1}B)(1-θ\_{12}B^{12})}{(1-B)(1-B^{12})}a\_{t}……………….……(1)$$

$$S\_{16}=\left\{\begin{array}{c}0, if t<16\\ 1, if t\geq 16 \end{array}\right.$$

whereis the AIRH observed at time *t,*  is the intervention effective coefficient parameter, and the effect is a step function beginning with the 16th observation (that is, at three months ahead of the start of the economic crisis). In addition,  and  are the first-order moving average parameter and the parameter which is adjusted with a monthly difference, respectively, while *B* is the backshift operator, and  is white noise. The noise follows a  model, which is adjusted with a monthly difference. The estimates (SE) of $ω$, $ϕ\_{1}$, and $ϕ\_{12}$ are 4.711(0.910), 0.848(0.072), and 0.662(0.120), respectively. The parameters are all statistically significant (*p* < 0.05). The residuals from the augmented model did not differ from the white noise (Box-Ljung Q-statistics (with 16 months) = 7.82 (*p* = 0.6462)). This specification was accepted as a model for monthly measurement. The parameters were all statistically significant (*p* < 0.05), and the residual ACFs did not exhibit any model inadequacy. The selected intervention model presented an abrupt permanent change in the level of outcome series. Those results imply that the advance of the intervention induced an abrupt change in the AIRH since April 2008.

*Women*

$$y\_{t}=ωS\_{16}+\frac{(1-θ\_{1}B)(1-θ\_{12}B^{12})}{(1-B)(1-B^{12})}a\_{t}……………….……(2)$$

The estimates (SE) of $ω$, $θ\_{1}$, and $θ\_{12}$are 4.420(1.793), 0.624(0.109), and 0.704(0.115), respectively. The noise follows a $SARIMA(\left(0,1,1\right),\left(0,1,1\right)\_{12})$ model. The residuals from the augmented model did not differ from the white noise (Box-Ljung Q-statistics (with 16 months) = 10.70 (*p* = 0.3810)). Those results imply that a change in the AIRH began in April 2008.

*Middle income:*

*Men*

$$y\_{t}=\frac{ωB^{2}}{1-δ\_{1}B}I\_{19-25}+\frac{(1-θ\_{1}B)(1-θ\_{12}B^{12})}{(1-B)(1-B^{12})}a\_{t}…….……(3)$$

$$I\_{19-25}=\left\{\begin{array}{c}1, if 19\leq t\leq 25\\ 0, else \end{array}\right.$$

The noise follows a $SARIMA(\left(0,1,1\right),\left(0,1,1\right)\_{12})$ model, which is adjusted with a monthly difference. The estimates (SE) of $ω$, $δ\_{1}$, $θ\_{1}$, and $θ\_{12}$ are -0.369 (0.168), 0.759 (0.157), 0.733 (0.099), and 0.732 (0.124), respectively. The residuals from the augmented model did not differ from the white noise (Box-Ljung Q-statistics (with 12 months) = 7.17 (*p* = 0.7090)). The parameters were all statistically significant (*p* < 0.05). Those results imply that a temporary change in the induced AIRH began in September 2008 (that is, there was a two-month lag after the start of the economic crisis) and was sustained until February 2009 (an eight-month lag after the start of the economic crisis).

*Women*

$$y\_{t}=ωS\_{19}+\frac{(1-θ\_{1}B)(1-θ\_{12}B^{12})}{(1-B)(1-B^{12})}a\_{t}……………….……(4)$$

$$S\_{19}=\left\{\begin{array}{c}0, if t<19\\ 1, if t\geq 19 \end{array}\right.$$

The noise follows a $SARIMA(\left(0,1,1\right),\left(0,1,1\right)\_{12})$ model, which is adjusted with a monthly difference. The estimates (SE) of $ω$, $θ\_{1}$, and $θ\_{12}$are -0.043 (0.720), 0.657 (0.104), and 0.581 (0.133), respectively. The residuals from the augmented model did not differ from white noise (Box-Ljung Q-statistics (with 19 months) = 6.40 (*p* = 0.7809)). The intervention coefficient parameters were not statistically significant (*p* > 0.05). Those results imply that no change in the AIRH was induced by the economic crisis that began in July 2008.

*High income:*

*Men*

$$y\_{t}=ωS\_{19}+\frac{(1-θ\_{1}B)}{(1-B)}a\_{t}……………….……(5)$$

The estimates (SE) of $ω$ and $θ\_{1}$ are 0.068 (0.254) and 0.825 (0.069), respectively. The noise follows an $ARIMA\left(0,1,1\right)$ model. The residuals from the augmented model did not differ from the white noise (Box-Ljung Q-statistics (with 19 months) =9.33 (*p* = 0.5911)). The intervention coefficient parameter was not statistically significant (*p* > 0.05). Those results imply that no change in the AIRH was induced by the economic crisis that began in July 2008.

*Women*

$$y\_{t}=\frac{ω}{1-δ\_{1}B}S\_{16}+\frac{(1-θ\_{1}B)}{(1-B)}a\_{t}……………….……(6)$$

The estimates (SE) of $ω$, $δ\_{1}$, and $θ\_{1}$are 0.154 (0.030), 0.960 (0.010), and 0.975 (0.041), respectively. The selected intervention model presents gradual but permanent changes in the level of outcome series. The noise follows an $ARIMA\left(0,1,1\right)$ model. The residuals from the augmented model did not differ from the white noise (Box-Ljung Q-statistics (with 19 months) = 11.32 (*p* = 0.4172)). Those results imply that a gradual change in the AIRH was induced by the economic crisis that began in April 2008.