

Appendix A

Table A.1.
Definition of variables.

Variable	Definition
Commute length	Time taken in minutes to travel between home and work
Commute over average	Dichotomous variable that indicates if the commuting time of the individual is over the average of the sample
Job satisfaction	Variable measured on a 0-10 scale corresponding to the question 'Indicate your degree of satisfaction in your current work'
Satisfaction with housing	Variable measured on a 0-10 scale corresponding to the question 'Indicate your degree of satisfaction with your dwelling'
Satisfaction with personal life	Variable measured on a 0-10 scale corresponding to the question 'Indicate your degree of satisfaction with your personal life'
Satisfaction with leisure time	Variable measured a 0-10 scale corresponding to the question 'Indicate your degree of satisfaction with your available leisure time'
Woman	Dichotomous variable that indicates if the individual is a woman
Age	Age in years
Native	Dichotomous variable that indicates if the individual has Spanish nationality
Secondary education	Dichotomous variable that indicates if the individual has secondary education
University education	Dichotomous variable that indicates if the individual has higher education
Lives with working partner	Dichotomous variable that indicates if the individual lives with a working partner
Lives with non-working partner	Dichotomous variable that indicates if the individual lives with a non-working partner
Lives with child under 15	Dichotomous variable that indicates if the individual lives with at least a child younger than 15
Household income	Household's monthly income in euros
Year	Four dichotomous variables that indicate the year that the wave of the survey corresponds to (2007 to 2010)
Crisis	Dichotomous variable that indicates if the year of the wave of the survey corresponds to the economic crisis (2008 to 2010) as opposed to the expansion (2007)
Region	Seventeen dichotomous variables that indicate the region where the individual resides
Size of municipality	Five dichotomous variables that indicate the size of the municipality where the individual resides (lower than 10,000; between 10,000 and 49,999; between 50,000 and 99,999; between 100,000 and 1,000,000; and over 1,000,000)
Density	Average population density of the municipalities with a similar size inside the region of residence (inhabitants per squared kilometre)
Public sector	Dichotomous variable that indicates if the individual works in the public sector
Mode of transport	Dichotomous variables that indicate what type of transportation the individual uses mainly to move daily to his/her work (car as a driver; motorbike; car as a passenger; bus; metro/tram; train; walking; bike; other)
Public mode of transport	Dichotomous variable that indicates whether the commuting mode is public (taxi; bus; metro/tram; train)
Salary	Monthly salary in euros
Hours worked per week	Hours worked in a normal week
Full time	Dichotomous variable that indicates if the individual works full time (vs. part-time)
Continuous working day	Dichotomous variable that indicates if the individual has a continuous working day
Works weekend	Dichotomous variable that indicates if the individual usually works on Saturday or Sundays
Works nights	Dichotomous variable that indicates if the individual usually works on nights
Permanent contract	Dichotomous variable that indicates if the individual has an indefinite (vs. fixed-term) contract
Seniority	Seniority in years of the individual in their current firm
Semi-skilled occupation	Dichotomous variable that indicates if the individual works in a semi-skilled occupation
Skilled occupation	Dichotomous variable that indicates if the individual works in a skilled occupation
Carries out supervisory tasks	Dichotomous variable that indicates if the individual has supervisory tasks
Overqualified	Dichotomous variable that indicates if the individual considers that his/her job requires less training than he/she has
Size of the company	Three dichotomous variables that indicate the size of the company (lower than 10; between 10 and 249; and higher than 249)
Level of routine at work	Variable measured on a 0-10 scale corresponding to the question 'Indicate the monotony-routine level of your current job'
Level of physical effort at work	Variable measured on a 0-10 scale corresponding to the question 'Indicate the level of

Danger/perceived risk at work	physical effort of your current job' Variable measured on a 0-10 scale corresponding to the question 'Indicate the level of risk or danger situations of your current job'
Health and safety at work	Variable measured on a 0-10 scale corresponding to the question 'Indicate the level of health and safety of your current job'

Table A.2.
Descriptive variables.

	Average	Standard deviation	Minimum	Maximum
Commute length (minutes)	21.78	19.07	0	180
Commute over average	0.33	0.47	0	1
Job satisfaction	7.28	1.74	0	10
Satisfaction with housing	7.72	1.71	0	10
Satisfaction with personal life	7.51	1.82	0	10
Satisfaction with leisure time	6.37	2.42	0	10
Woman	0.44	0.50	0	1
Age	41.25	10.68	16	65
Native	0.71	0.46	0	1
Secondary education	0.55	0.50	0	1
University education	0.27	0.44	0	1
Lives with working partner	0.34	0.47	0	1
Lives with non-working partner	0.31	0.46	0	1
Lives with child under 15 years old	0.35	0.48	0	1
Household income	1990,8	1142,4	450	7,500
Year 2007	0.24	0.43	0	1
Year 2008	0.26	0.44	0	1
Year 2009	0.25	0.43	0	1
Year 2010	0.25	0.43	0	1
Size of municipality < 10,000	0.20	0.40	0	1
Size of municipality 10,000-49,999	0.27	0.44	0	1
Size of municipality 50,000-99,999	0.12	0.33	0	1
Size of municipality 100,000-1,000,000	0.33	0.47	0	1
Size of municipality >1,000,000	0.08	0.27	0	1
Density	1.739,9	2954,5	9.7	16,307.5
Private sector	0.75	0.43	0	1
Mode of transport: Car (as driver)	0.56	0.49	0	1
Mode of transport: Motorbike	0.03	0.17	0	1
Mode of transport: Car (as passenger)	0.04	0.20	0	1
Mode of transport: Bus	0.08	0.08	0	1
Mode of transport: Metro/Tram	0.04	0.04	0	1
Mode of transport: Train	0.02	0.02	0	1
Mode of transport: Bike	0.01	0.01	0	1
Mode of transport: Walking	0.19	0.20	0	1
Mode of transport: Other	0.02	0.02	0	1
Salary	1334,4	708,5	450	7,500
Hours worked per week	38.94	87.82	1	168
Full time	0.87	0.34	0	1
Continuous working day	0.58	0.49	0	1
Works weekend	0.15	0.36	0	1
Works nights	0.14	0.35	0	1
Permanent contract	0.77	0.42	0	1
Seniority	10.16	10.32	0	49
Semi-skilled occupation	0.53	0.50	0	1
Skilled occupation	0.34	0.47	0	1
Carries out supervisory tasks	0.20	0.40	0	1
Overqualified	0.19	0.39	0	1
Company size 10-249	0.22	0.42	0	1
Company size 250 or more	0.55	0.50	0	1
Level of routine at work	4.89	3.12	0	10
Level of physical effort at work	4.52	3.22	0	10
Danger/perceived risk at work	3.56	3.21	0	10
Health and safety at work	7.31	2.16	0	10
<i>Number of observations</i>				25,957

Table A.3
Average length of commute by satisfaction levels in different domains.

	Job satisfaction	Satisfaction with housing	Satisfaction with personal life	Satisfaction with leisure time
Satisfaction level				
0	25.9	23.7	24.9	23.3
1	26.1	26.0	29.5	25.2
2	27.3	24.8	27.9	24.5
3	23.6	24.4	22.5	24.8
4	25.9	24.6	24.6	24.8
5	24.6	24.2	23.6	22.1
6	23.0	23.9	23.5	22.2
7	22.1	22.4	22.0	21.3
8	21.0	21.4	21.3	19.9
9	20.6	21.0	20.9	19.9
10	18.6	19.6	20.0	19.1

Table A.4.
Determinants of satisfaction.
Alternative measurement of commuting.

	Job satisfaction	Satisfaction with housing	Satisfaction with personal life	Satisfaction with leisure time
<i>General analysis</i>				
Commuting higher than average	-0.299 (0.023)***	-0.250 (0.022)***	-0.259 (0.024)***	-0.446 (0.032)***
<i>Analysis by economic cycle stage</i>				
Commuting higher than average	-0.206 (0.029)***	-0.132 (0.028)***	-0.153 (0.030)***	-0.196 (0.040)***
Commuting higher than average*Crisis	0.092 (0.046)**	-0.312 (0.045)***	-0.280 (0.047)***	0.132 (0.064)**
<i>Analysis by size of municipality</i>				
Commuting higher than average	-0.150 (0.030)***	-0.103 (0.029)***	-0.143 (0.030)***	-0.235 (0.041)***
Commuting higher than average*Size medium-low	-0.231 (0.057)***	-0.138 (0.055)**	-0.232 (0.059)***	-0.414 (0.079)***
Commuting higher than average*Size medium	-0.324 (0.072)***	-0.244 (0.070)***	-0.218 (0.074)***	-0.525 (0.100)***
Commuting higher than average*Size medium-high	-0.310 (0.053)***	-0.295 (0.052)***	-0.191 (0.055)***	-0.333 (0.074)***
Commuting higher than average*Size high	-0.535 (0.069)***	-0.700 (0.067)***	-0.452 (0.071)***	-0.782 (0.096)***
<i>Analysis by density</i>				
Commuting higher than average	-0.259 (0.024)***	-0.186 (0.024)***	-0.224 (0.025)***	-0.390 (0.034)***
Commuting higher than average*Density (/1000)	-0.029 (0.006)***	-0.048 (0.006)***	-0.026 (0.006)***	-0.042 (0.009)***
<i>Analysis by economic sector</i>				
Commuting higher than average	-0.344 (0.024)***	-0.398 (0.023)***	-0.283 (0.024)***	-0.530 (0.033)***
Commuting higher than average*Public sector	0.372 (0.052)***	0.098 (0.051)**	0.193 (0.054)***	0.684 (0.072)***
<i>Analysis by gender</i>				
Commuting higher than average	-0.249 (0.026)***	-0.194 (0.026)***	-0.204 (0.027)***	-0.402 (0.037)***
Commuting higher than average*Woman	-0.227 (0.061)***	-0.254 (0.060)***	-0.250 (0.063)***	-0.203 (0.086)**
<i>Analysis by commuting mode</i>				
Commuting higher than average	-0.256 (0.025)***	-0.189 (0.024)***	-0.219 (0.026)***	-0.418 (0.035)***
Commuting higher than average*Public transport	-0.190 (0.045)***	-0.271 (0.043)***	-0.175 (0.046)***	0.123 (0.062)**

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Results of the estimation by multivariate regression of four different related models where dependent variables are satisfaction with job, housing, personal life and leisure time, respectively. The standard errors of the variables are robust. Explanatory variables have also been included as controls of gender, age, nationality, level of education, living with working partner, living with non-working partner, living with a child under 15 years old, household income, and, in the case of the disaggregated analysis by size of municipality and density, fixed effects by region. In the analysis by size of municipality Size low is the reference category.

Table A.5.
Determinants of satisfaction.
Disaggregated analysis by level of household income.

	Job satisfaction	Satisfaction with housing	Satisfaction with personal life	Satisfaction with leisure time
<i>A) Household income above average</i>				
<i>General analysis</i>				
Length of commuting/60	-0.338 (0.053)***	-0.313 (0.049)***	-0.263 (0.052)***	-0.793 (0.079)***
<i>Analysis by economic cycle stage</i>				
Length of commuting/60	-0.399 (0.089)***	-0.227 (0.083)***	-0.170 (0.088)*	-0.710 (0.133)***
Length of commuting/60*Crisis	0.083 (0.099)	-0.118 (0.092)	-0.128 (0.098)	-0.114 (0.147)
<i>Analysis by gender</i>				
Length of commuting/60	-0.278 (0.071)***	-0.228 (0.066)***	-0.208 (0.070)***	-0.797 (0.106)***
Length of commuting/60*Woman	-0.135 (0.106)	-0.191 (0.099)*	-0.122 (0.105)	0.009 (0.158)
<i>B) Household income under average</i>				
<i>General analysis</i>				
Length of commuting/60	-0.567 (0.043)***	-0.448 (0.043)***	-0.486 (0.045)***	-0.731 (0.059)***
<i>Analysis by economic cycle stage</i>				
Length of commuting/60	-0.777 (0.067)***	-0.245 (0.067)***	-0.324 (0.070)***	-0.783 (0.091)***
Length of commuting/60*Crisis	0.295 (0.072)***	-0.286 (0.072)***	-0.227 (0.076)***	0.215 (0.098)***
<i>Analysis by gender</i>				
Length of commuting/60	-0.560 (0.055)***	-0.400 (0.054)***	-0.421 (0.057)***	-0.801 (0.074)***
Length of commuting/60*Woman	-0.020 (0.089)	-0.127 (0.088)	-0.170 (0.093)*	0.183 (0.120)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Results of the estimation by multivariate regression of four different related models where dependent variables are satisfaction with job, housing, personal life and leisure time, respectively. The standard errors of the variables are robust. Explanatory variables have also been included as controls of gender, age, nationality, level of education, living with working partner, living with non-working partner, living with a child under 14 years old, and household income.

Table A.6.
Determinants of job satisfaction.
Extended specification of model with characteristics of job positions.

	Total
Length of commute/60	-0.319 (0.033)***
Woman	0.136 (0.022)***
Age	-0.037 (0.007)***
Age*Age	0.000 (0.000)***
Native	0.040 (0.020)**
Secondary education	0.019 (0.029)
University education	-0.036 (0.039)
Lives with working partner	0.077 (0.027)***
Lives with non-working partner	0.105 (0.028)***
Lives with child under 15 years old	0.026 (0.024)
Household income (/1000)	0.007 (0.012)
Salary	0.000 (0.000)***
Hours worked per week	-0.011 (0.002)***
Full time	0.222 (0.036)***
Continuous working day	0.027 (0.021)
Works weekends	-0.065 (0.029)**
Works nights	-0.013 (0.030)
Fixed contract	0.257 (0.026)***
Seniority	-0.005 (0.001)***
Semi-skilled occupation	0.076 (0.033)**
Skilled occupation	0.081 (0.040)**
Supervising	0.071 (0.024)***
Overqualified	-0.672 (0.027)***
Company size 10-249	-0.056 (0.029)*
Company size 250 or more	0.016 (0.026)
Level of routine at work	-0.083 (0.003)***
Level of physical effort at work	-0.007 (0.004)*
Danger/perceived risk at work	-0.014 (0.004)***

Health and safety at work	0.293 (0.006)***
Constant	6.250 (0.160)***
<i>N</i>	25,957

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Results of the estimation by ordinary least squares of a model where dependent variable is satisfaction with job. The standard errors of the variables are robust.

Table A.7.
Impact of commuting on satisfaction.
Analysis across the distribution of satisfaction domains.

Length of commute/60	Percentile 10	Percentile 20	Percentile 30	Percentile 40	Percentile 50	Percentile 60	Percentile 70	Percentile 80	Percentile 90
Job satisfaction	-0.461 (0.008)***	-0.467 (0.009)***	-0.469 (0.006)***	-0.469 (0.006)***	-0.459 (0.005)***	-0.459 (0.005)***	-0.459 (0.005)***	-0.499 (0.005)***	-0.509 (0.004)***
Satisfaction with housing	-0.386 (0.005)***	-0.384 (0.006)***	-0.376 (0.005)***	-0.380 (0.005)***	-0.375 (0.005)***	-0.370 (0.005)***	-0.387 (0.005)***	-0.415 (0.005)***	-0.420 (0.004)***
Satisf. with personal life	-0.397 (0.005)***	-0.406 (0.006)***	-0.409 (0.006)***	-0.397 (0.005)***	-0.398 (0.005)***	-0.397 (0.005)***	-0.419 (0.006)***	-0.433 (0.005)***	-0.442 (0.005)***
Satisf. with leisure time	-0.766 (0.016)***	-0.741 (0.011)***	-0.746 (0.011)***	-0.755 (0.013)***	-0.743 (0.010)***	-0.747 (0.010)***	-0.729 (0.008)***	-0.729 (0.008)***	-0.752 (0.011)***

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Results of the estimation by multivariate regression of four different related models where dependent variables are satisfaction with job, housing, personal life and leisure time, respectively. The standard errors of the variables are robust. Explanatory variables have also been included as socio-demographic characteristics (age and age squared; nationality; level of studies; living with a working/non-working partner and/or child under 15 years old and household income).

Figure A.1.
Distribution of satisfaction variables. 2007-2010. ECVT.

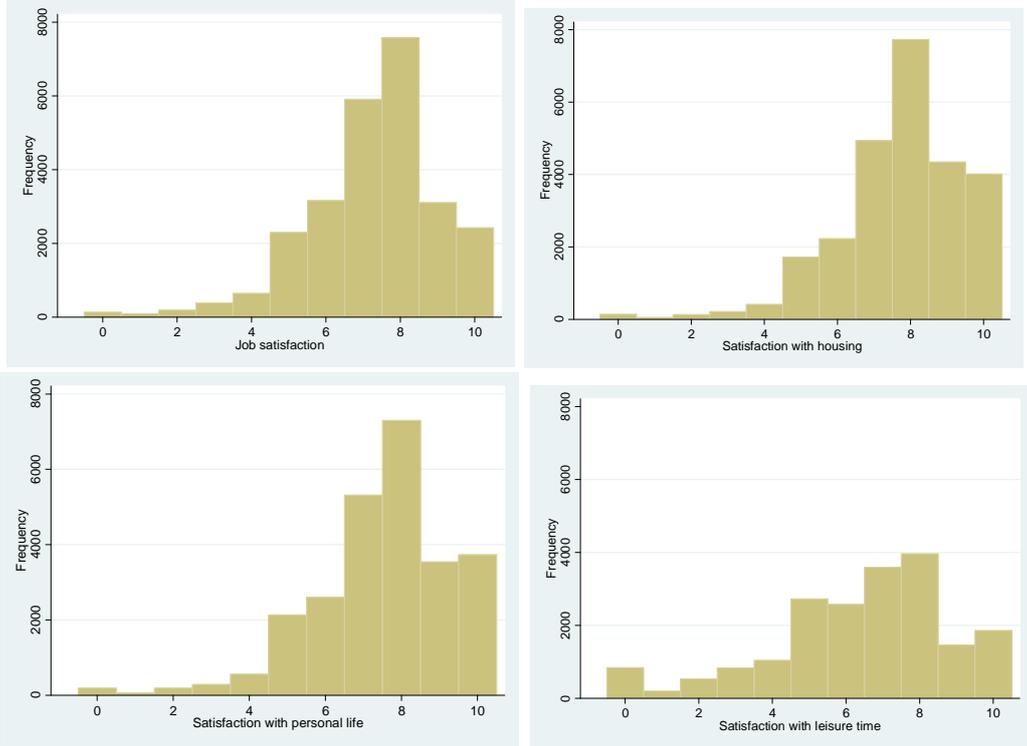


Figure A.2.
Distribution of travel time (length of commute). 2007-2010. ECVT.

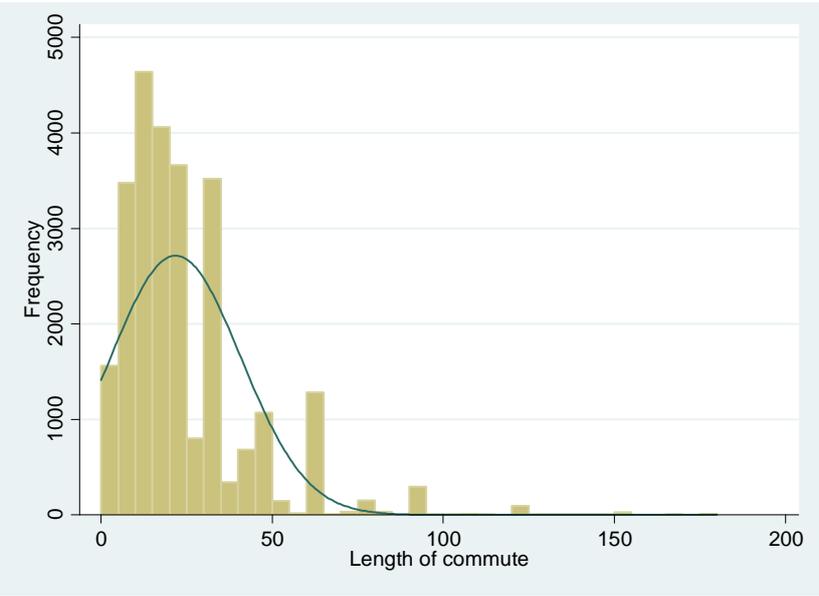
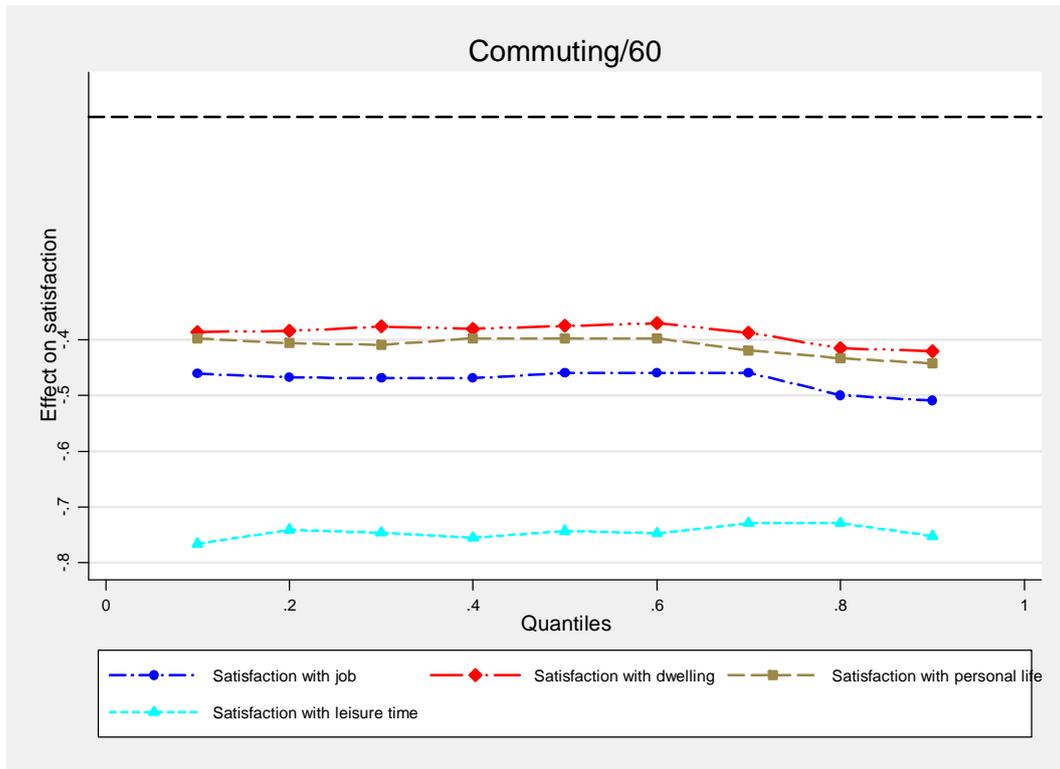


Figure A.3.
Impact of commuting on satisfaction.
Analysis across the distribution of the satisfaction domains.



Appendix B. Unconditional quantile regression

The method proposed by Firpo, Fortin and Lemieux (2009) estimates the effect of independent variables on the quantiles of the unconditional distribution of a dependent variable, unlike traditional methods of quantile regression, which estimate the effect on the conditional distribution of the dependent variable. This method consists of running a regression of the dependent variable (W ; in our case satisfaction) when this is substituted by a transformation of itself, the *recentered influence function* (from now on, RIF).

The influence function is a tool traditionally used in the field of robust estimation, which measures the effect in distributional statistics of small changes in the underlying distribution.

Thus, for a distributional statistic given the distribution $F_W, v(F)$, this function measures the influence of an individual observation on that distributional statistic. Firpo, Fortin and Lemieux (2009) suggest using a recentered influence function after adding back the statistic of interest, $RIF(W)=v(F)+IF(W)$, given that its expectation is equal to $v(F)$ (insofar as expectation of the influence function regarding the distribution of W is, by definition, zero).

The influence function, $IF(W, Q_\theta)$, of the quantiles Q_θ of the unconditional marginal distribution F_W is defined as:

$$IF(W / Q_\theta) = \frac{\theta - I\{W < Q_\theta\}}{f_W(Q_\theta)} \quad (1)$$

Where $I\{\cdot\}$ is an indicator function and f_W is the density function of the unconditional distribution of W evaluated at Q_θ .

Given that the recentered influence function, $RIF(W, Q_\theta)$, is equal to $Q_\theta + IF(W, Q_\theta)$, therefore it follows on that:

$$RIF(W / Q_\theta) = Q_\theta + \frac{\theta - I\{W < Q_\theta\}}{f_W(Q_\theta)} \quad (2)$$

Hence, the RIF function can be computed empirically in the case of quantiles through a local inversion, after calculating the dummy variable $I\{W < Q_\theta\}$ (indicating whether the value of W is greater or lower than Q_θ), estimating the sample quantile Q_θ and estimating using the kernel density function of the corresponding density function f_W evaluated at Q_θ .

After calculating the RIF function for the quantiles, a value is generated for the transformed variable for each observation in the sample. Insofar as the impact of change on the distribution of an explanatory variable on the quantile can be expressed *ceteris paribus* as the average partial effect of that variable on the conditional expectation of its RIF function, and assuming that the conditional expectation of the RIF function can be modelled as a linear function of the explanatory variables, these values can be used for the estimation using an ordinary least squares regression of the RIF variable in a vector of explanatory variables. The estimated coefficients can be interpreted as the effect of an increase in the average value of an explanatory variable on the quantile of the unconditional distribution of an outcome variable, what Firpo, Fortin and Lemieux (2009) call unconditional quantile regression.