Appendix - Definition of Variables

Below all variables used in the model are provided.

Clarification of abbreviation under the heading "Type":

        Aux = Auxiliary equation
        Var = Exogenous variable – used for model analysis
        Con = Constant
        Par = parameter, to be estimated independently

Terms are sorted in order of discussion in the paper.

Indices that are used throughout:

Index	Description
i, j	platform type; $i, j \in \{N\}$; N = Total number of platforms
q	population segment; $q \in \{d, nd\}$, d=drivers, nd=non-drivers; used in conjunction with index i: for instance, the combination (nd, i) indicates all households that not drive platform i
m	cohort in aging chain for Fleet i ; $m \in \{M\}$; M=total number of cohorts in the aging chain
l	attributes of a platform; $l \in \{L\}$; L total number of attributes
k	source for updating of opinions; $k \in \{d, nd, ma, ex\}$, ma = marketin&media, ex = experience

1.   Consumer Choice

Term	Type	Unit	Name
F_i	Stock	[vehicles]	fleet of platform i
s_i	Flow	[vehicles/year]	sales of platform i
dc_i^m	Flow	[vehicles/year]	vehicle discards of platform i for cohort m
dc_i^T	Aux	[vehicles/year]	total discards of platform i
$rs_{j,i}$	Aux	[vehicles/year]	replacement sales of platform i coming from platform j
rs_i	Aux	[vehicles/year]	replacement sales of platform i
ns_i	Aux	[vehicles/year]	total sales by new households for platform i
$\sigma_{j,i}$	Aux	[dmnl]	share of replaced discards from platform j to i
$ea_{j,i}$	Aux	[dmnl]	effective attractiveness of platform i perceived by driver of platform j
ea_i^q	Aux	[dmnl]	effective attractiveness of platform i perceived by population segment (q,i)
ea_N^q	Aux	[dmnl]	1xN vector of effective attractiveness of platforms i perceived by population segment (q,i)
I_{NxN}	Con	[dmnl]	*NxN* identity matrix
ea_j^T	Aux	[dmnl]	sum of effective attractiveness of all platforms as perceived by a driver of platform j
fa_i^q	Aux	[dmnl]	familiarity of population segment (q,i) with platform i
a_i^q	Aux	[dmnl]	attractiveness of platform i as perceived by population segment (q,i)
α_l	Aux	[dmnl]	sensitivity of attractiveness to attribute l
$x_{l,i}^q$	Aux	[dmnl]	value of attribute l of platform i as perceived by population segment (q,i)
x_l^*	Aux	[dmnl]	reference value of attribute l

2. Consumer Choice - continued

Term	Type	Unit	Name
rd_i^m	Aux	[vehicles/year]	replaced discards from platform i cohort m
ad_i^m	Aux	[vehicles/year]	discards from platform i cohort m as a result of total fleet shrinkage
rd_i^T	Aux	[vehicles/year]	total replaced discards from platform i
ad_i^T	Aux	[vehicles/year]	total discards from platform i as a result of total fleet shrinkage
$f_{s,i}^m$	Par	[dmnl]	survival fraction of vehicles in cohort m of platform i
τ_c	Con	[year]	average cohort residence time
$\tau_{d,i}$	Aux	[year]	average discard time of platform i
σ_i^{new}	Aux	[dmnl]	share of total new sales platform i by new households
$ea_i^{new,T}$	Aux	[dmnl]	total effective attractiveness of platforms as perceived by new households
F^*	Aux	[vehicles]	indicated fleet size
τ_s	Par	[year]	stock adjustment time
F	Aux	[vehicles]	total fleet
D	Par	[persons]	US-households with at least one driverslicence
f_v	Par	[vehicles/person]	average number of vehicles per household

3.   Familiarity

Term	Type	Unit	Description
FA_i^q	Stock	$[\text{dmnl}]$	total familiarity with platform i for population segment (q,i)
fc_i	Flow	$[\text{dmnl/year}]$	flow of familiarity with platform i of non-drivers of i that convert to i
fd_i	Flow	$[\text{dmnl/year}]$	flow of familiarity with platform i of drivers of i that discard i
fg_i^q	Flow	$[\text{dmnl/year}]$	familiarity gain of population segment (q,i)
fl_i^{nd}	Flow	$[\text{dmnl/year}]$	familiarity loss of all non-drivers of platform i
$fa^{\max}$	Con	$[\text{dmnl/year}]$	maximum familiarity
N_i^q	Aux	$[\text{people}]$	total population of segment (q,i)
d_i	Aux	$[\text{dmnl}]$	drivers of platform i as fraction of total driving population
η_i^s	Aux	$[\text{dmnl/year}]$	total socialization effectiveness for platform i
η_i^m	Par	$[\text{dmnl/year}]$	marketing effectiveness for platform i
c	Con	$\left[\dfrac{\text{contacts/}}{\text{person/year}}\right]$	contact rate between households
p^q	Par	$\left[\dfrac{\text{persons/}}{\text{contact}}\right]$	persuasiveness of drivers population
λ_i^f	Aux	$[\text{dmnl/year}]$	familiarity loss fraction for platorm i
λ_0^f	Par	$[\text{dmnl/year}]$	unconstrained familiarity loss fraction
ε^{sf}	Aux	$[\text{dmnl}]$	effect of socialization effectiveness on forgetting
α_r	Con	$[\text{dmnl}]$	sensitivity of forgetting to socialization effectiveness
$\tilde{x}_0$	Con	$[\text{dmnl}]$	inflection point for effect of socialization effectiveness on forgetting with threshold effect

4.   Attractiveness

Term	Type	Unit	Description
$PX_{l,i}^{q}$	Stock	$[\text{dmnl}]$	perceived state of attribute l summed over population segment q of platform i
$xs_{l,i}^{nd}$	Flow	$[\text{dmnl/year}]$	flow of perceived state of attribute l for non-drivers of platform i that convert to i through sales of i
$xd_{l,i}^{d}$	Flow	$[\text{dmnl/year}]$	flow of perceived state of attribute l for drivers of platform i that convert to i through discard of i
$xu_{l,i}^{q}$	Flow	$[\text{dmnl/year}]$	update of the perceived state of attribute l for whole population segment q of platform i
$\eta_{l,i}^{s,q,k}$	Aux	$[\text{dmnl/year}]$	attractiveness adjustment effectiveness for population segment q of platform i for attribute l by source k
$\gamma_{l}^{x,q,k}$	Aux	$[\text{dmnl}]$	multiplier effect of persuasiveness for population segment q for attribute l by source k
γ_{l}^{x*}	Par	$[\text{dmnl}]$	reference multiplier effect of carryover effectiveness of attractiveness for attribute l with respect to that of familiarity
$px_{l,i}^{q}$	Aux	$[\text{dmnl}]$	perceived state of attribute l for population segment q of platform i
$x_{l,i}^{m}$	Stock	$[\text{dmnl}]$	state of attribute l of platform i in the margin (latest technology)- state as portrayed through marketing and media
$x_{l,i}^{e}$	Stock	$[\text{dmnl}]$	average state of attribute l of platform i in the market - state as experienced by drivers
τ_{e}	Aux	$[\text{year}]$	time to update one's experience with the technology in use

5.　　Learning, scale and infrastructure

Term	Type	Unit	Description
x_i^m	Aux	[dmnl]	performance of platform i in the margin (latest technology)
$\widetilde{pe}_i$	Aux	[dmnl]	effective production experience of platform i
z	Aux	[dmnl]	learning curve strength
f^x	Par	[dmnl]	fractional improvement in performance per doubling of effective experience
$so_i^{\sim i}$	Aux	[dmnl]	vector of spillover effects to platform i from all platforms except i
LPE_i	Aux	[dmnl]	lagged effective production experience of platform i,
pe_i	Aux	$[\text{dmnl}]$	normalized production experience with platform i
pe^*	Par	$[\text{vehicles}]$	reference effective production experience
$\gamma_{j,i}^{so}$	Par	[dmnl]	spillover fraction from platform j to i
G_{NN}^{so}	Aux	[dmnl]	*NxN* spillover matrix for all platforms, with elements $\gamma_{j,i}^{so}$
τ_{so}	Par	[years]	time for knowledge to spillover between platforms
P_i	Stock	[vehicles]	accumulated production experience for platform i
λ^e	Par	[years]	production experience decay rate
x_i^f	Aux	$[\text{dmnl}]$	average fleet performance of platform i
X_i^f	Stock	$[\text{vehicles}]$	accumulated fleet performance of platform i
MI	Aux	[dmnl]	Proxy for marketing impact: duration times effectiveness
T^m	Var	[years]	duration of marketing shock