

(Online) Appendix for

The Empirical Economics of Online Attention

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This appendix provides more details behind the predictions of the standard model under small or large setup costs summarized in Table 2. We assume utility is symmetric among sites, has decreasing marginal utility across sites, and is linear in the normalized and constant outside option of offline activities, so that $U(t_{i1}, \dots, t_{ij*}, T_i - (t_{i1} + \dots + t_{ij*}); \vec{W})$ can be written $U(t_{i1}, \dots, t_{ij*}; \vec{W}) + T_i - (t_{i1} + \dots + t_{ij*})$ and symmetry giving $U(t_{ik}, \dots, t_{i-k}; \vec{W}) = U(t_{i-k}, \dots, t_{ik}; \vec{W})$ and $U_k(t_{ik}, \dots, t_{i-k}; \vec{W}) = U_k(t_{i-k}, \dots, t_{ik}; \vec{W}) \forall i, t_{ik}, t_{i-k}$.

A.1 Total time online, TO_i

When setup costs are small ($F = 0$), the household visits all available sites and allocates equal amounts of time to all of them. When the number of sites increases from J to J^* , the total amount of time online TO_i increases by a factor of $\frac{J^*}{J}$, and when an alternative device becomes available, TO_i is unchanged because it represents time on the home device. The standard model with small setup costs predicts that total time online on the home device weakly increases in response to the increases in number of web sites when setup costs are small.

When setup costs are large ($F > 0$), the household may be constrained to visit a subset of sites even before the number of sites increases from J to J^* . When new sites arrive, households will either allocate the same amount of time to online activities or increase their time spent online. When an alternative device becomes available, a household that was previously constrained to visit a subset of sites may substitute some of those visits towards the alternative device, decreasing time online on the home device. If the household was not previously constrained, then additional time spent on the alternative device does not affect time on the home device. Therefore the effect of the two shocks on total time online in the presence of large setup costs is ambiguous.

A.2 Breadth of browsing, C_i

When setup costs are small ($F = 0$), the household visits all available sites and allocates equal amounts of time to all of them. When sites increase from J to J^* , the household visits as much as twice as many sites and spends no more time per site as the household did before. The household's breadth of browsing weakly declines. When an alternative device becomes available, the household continues to visit all sites on the home device in equal amounts, so that the breadth of browsing does not change. The standard model predicts the concentration of time across sites will fall in response to the two shocks when setup costs are small.

When setup costs are large ($F > 0$), the household may be constrained to visit a subset of sites even before the number of sites increases from J to J^* . When new sites arrive, households will either visit the same number of sites and spend equal amounts of time per site or will increase the number of sites visited and spend equal amounts of time per site; concentration of time across sites weakly declines. The alternative device either causes no change in the allocation of time on the home device or results in the household substituting site visits to the alternative device, in which case concentration of time across sites on the home device weakly increases. The net effect of the two shocks on the household's breadth of browsing is ambiguous when setup costs are large.

A.3 Depth of browsing, L_i

When setup costs are small ($F = 0$), the household can visit the same site any number of different times to reach the same amount of total time spent at that site: for instance, a single session of ten minutes or ten sessions of one minute each. The standard model with small setup costs does not make a prediction about the depth of browsing.

When setup costs are large ($F > 0$), time spent across all visited sites is identical and expended in a single, continuous session so as to incur the setup cost only once. The household may be constrained to visit a subset of sites, even before the number of sites increases from J to J^* . When new sites arrive, households will either visit the same number of sites and spend equal amounts of time per site as before or will increase the number of sites visited and spend equal amounts of time per site as before; in either case, the depth of browsing remains unchanged. The alternative device either causes no change in the allocation of time on the home device or results

in the household substituting site visits to the alternative device, but leaving the depth of browsing the remaining visits on the home device unchanged. The two shocks are not predicted to have any effect on the depth of browsing when setup costs are large.

Figure A.1
Distribution of Online Attention for Households
by Quartiles of Total Minutes Online

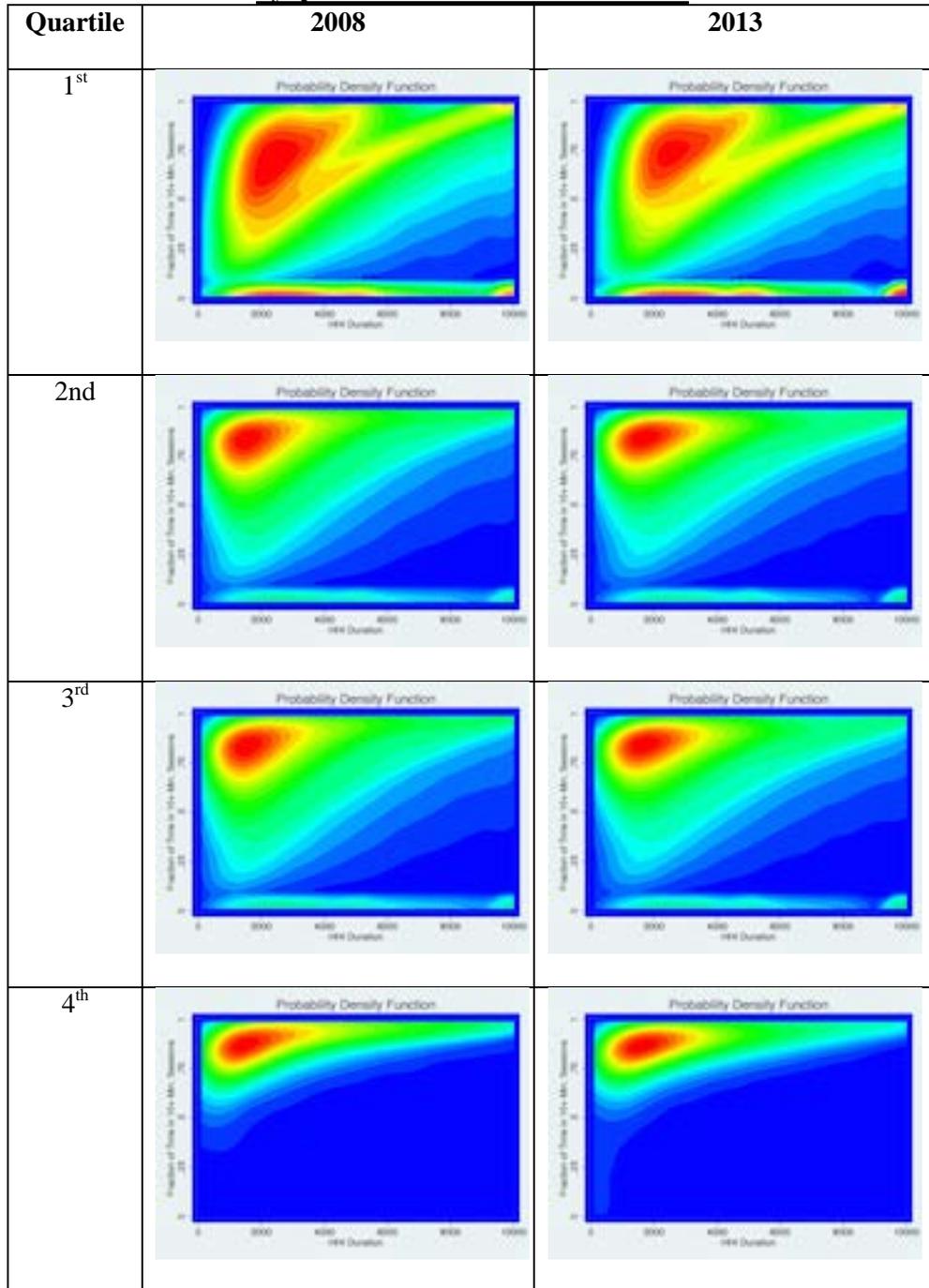


Figure A.2
Unconditional Distribution of Online Attention (2008 vs. 2013)
by Quartiles of Fraction of Time Spent Multitasking

