

The “Anatomy of Waiting” for Service

Common Experience:

- ▶ Expected to wait 5 minutes, Required to 10,
- ▶ Felt like 20, Actually waited 10,
- ▶ ... etc.

An attempt at “Modeling the Experience”:

1. Time that a customer **expects** to wait
2. **willing** to wait ((Im)Patience: τ)
3. **required** to wait (Offered Wait: V)
4. **actually** waits ($W_q = \min(\tau, V)$)
5. **perceives** waiting.

Experienced customers $\Rightarrow$ Expected = Required
"Rational" customers $\Rightarrow$ Perceived = Actual.

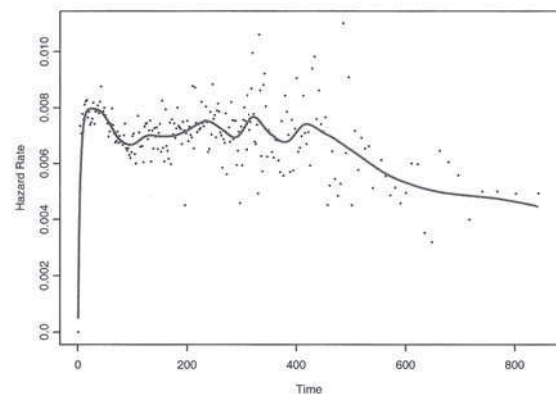
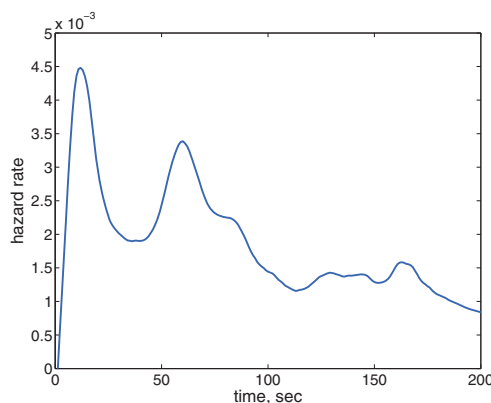
Then left with (τ, V) .

Call Center Data: Hazard Rates (Un-Censored)

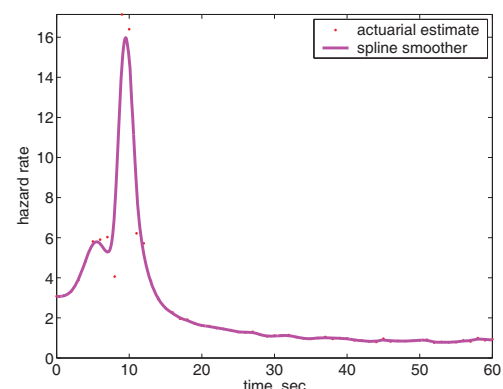
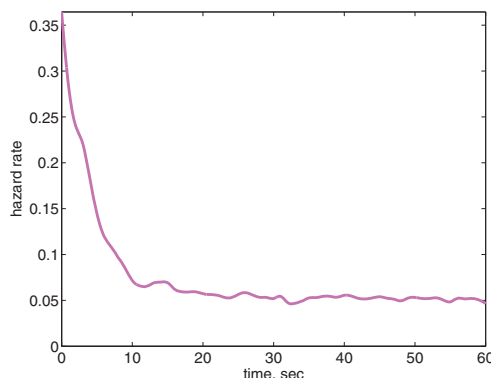
(Im)Patience Time τ

Required/Offered Wait V

Israel



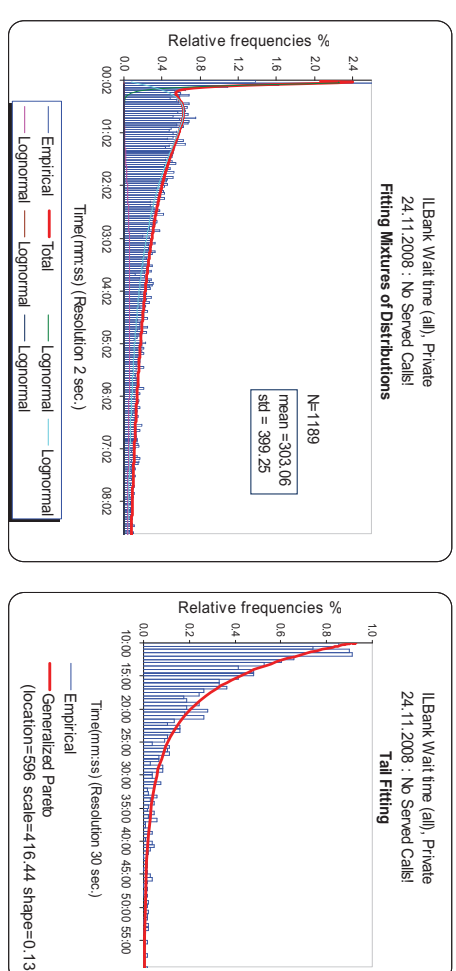
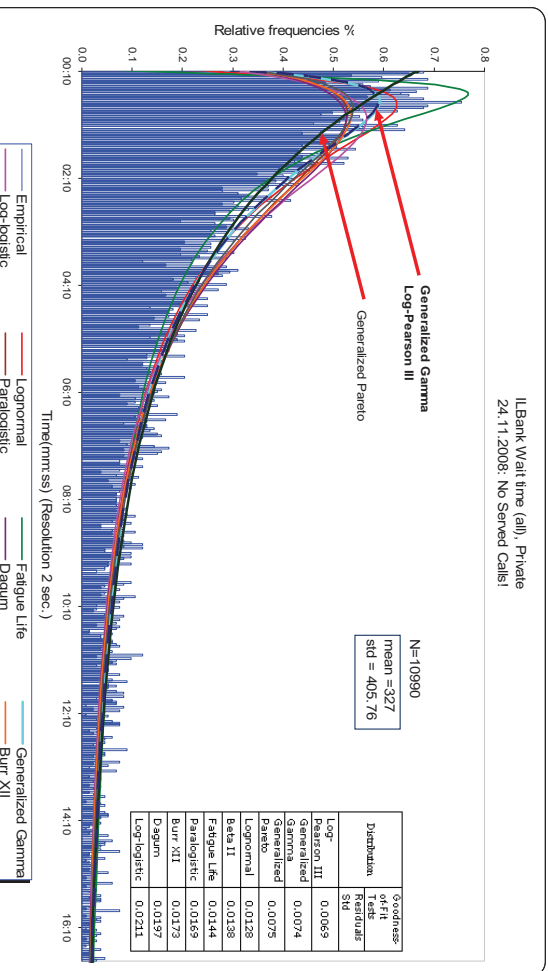
U.S.



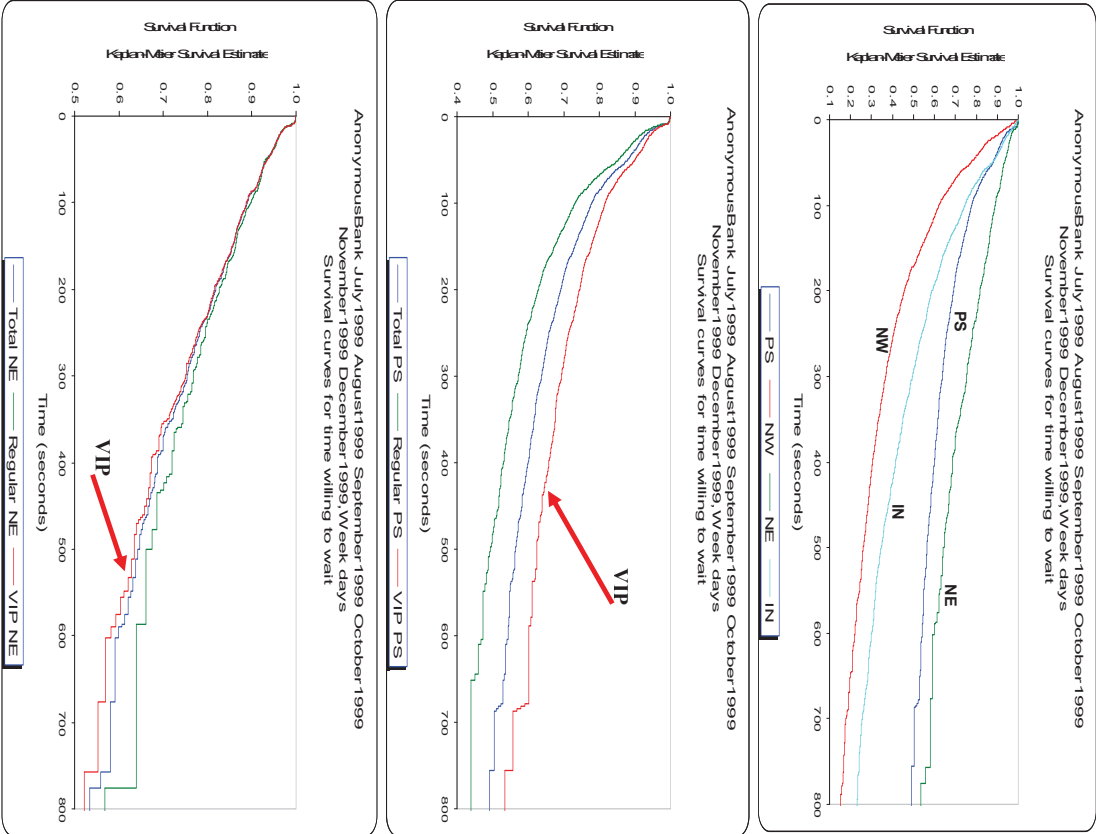
Note: 5% abandoning $\Rightarrow$ 95% (im)patience-observations **censored** !

Distribution Fitting

24.11.2008: No Served Calls!

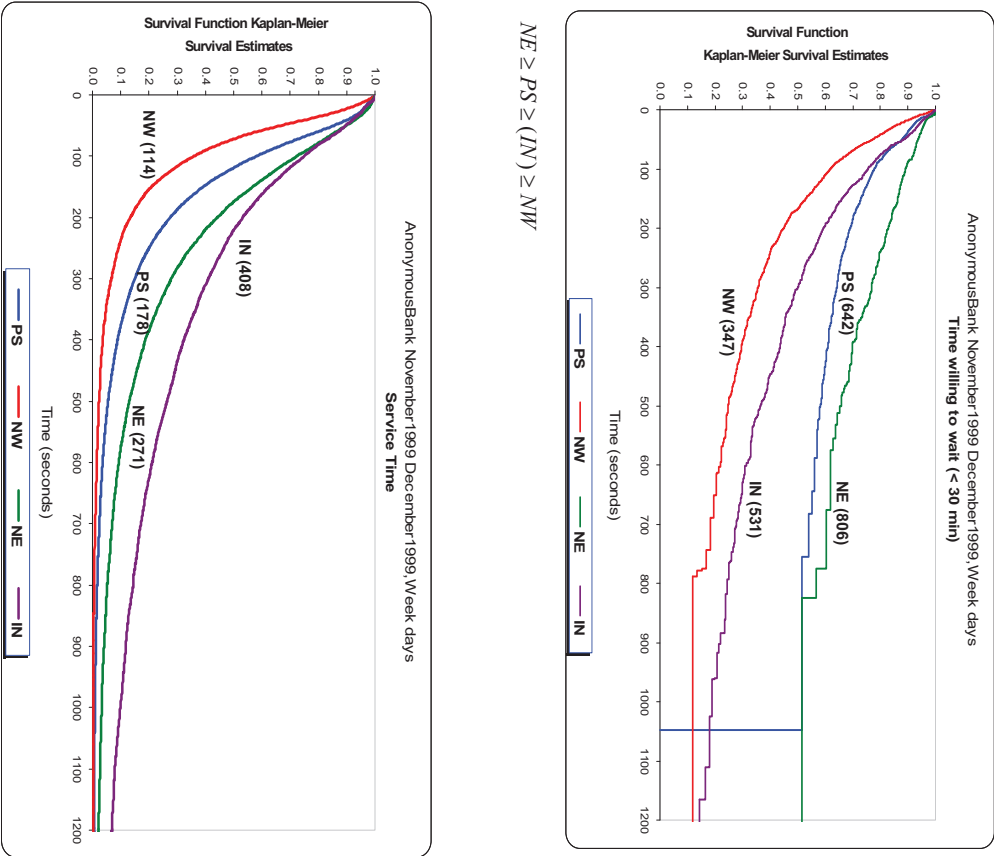


Survival Functions of (Im)Patience



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(Im)Patience vs. Service Durations (Stochastic Order)

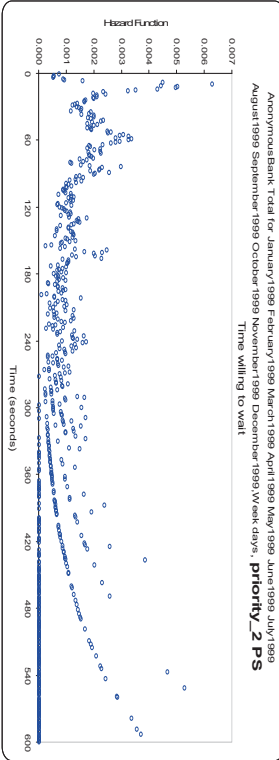
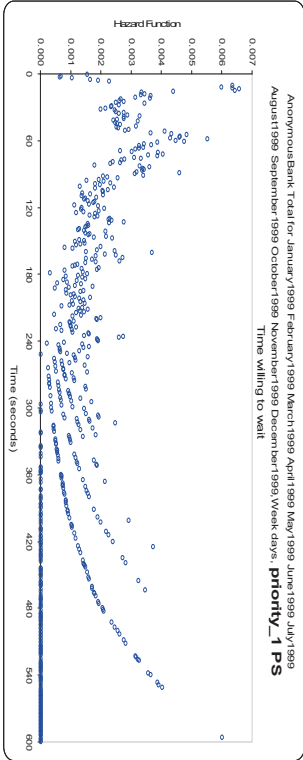
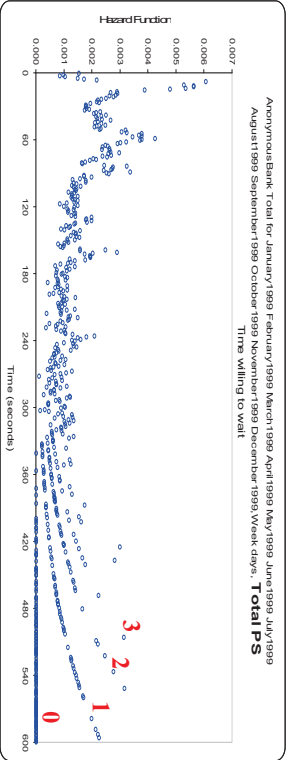


$NE \geq PS \geq (IN) \geq NW$

(IN) ≥ NE ≥ PS ≥ NW
Willing to wait longer for longer (worthier) services

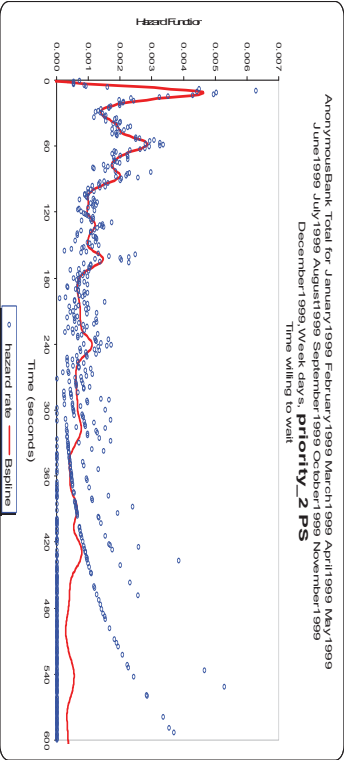
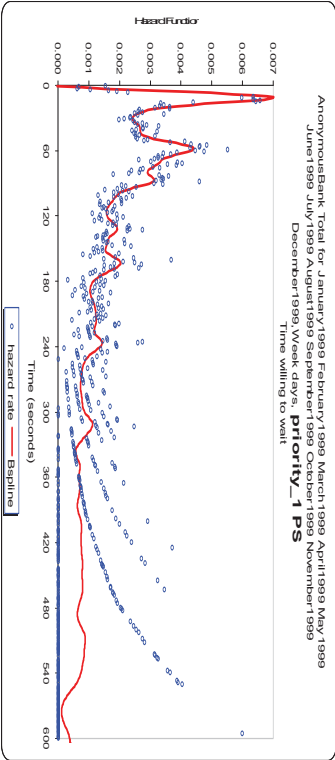
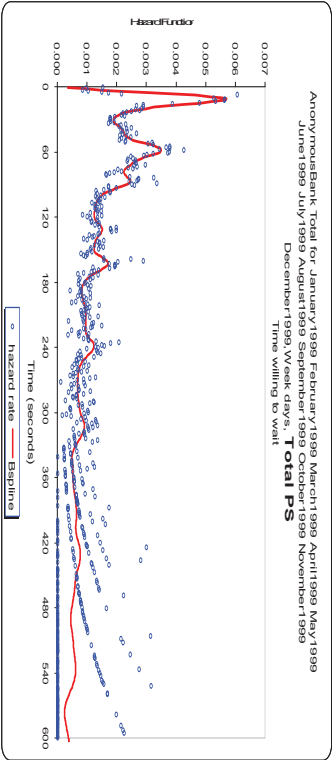
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Hazard Rates

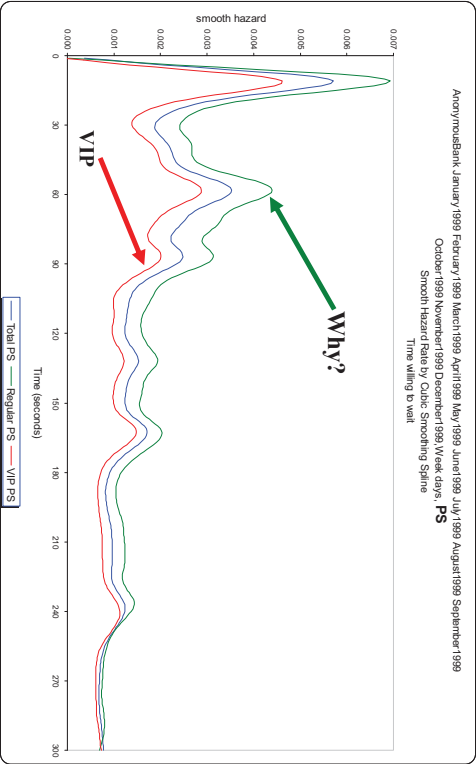
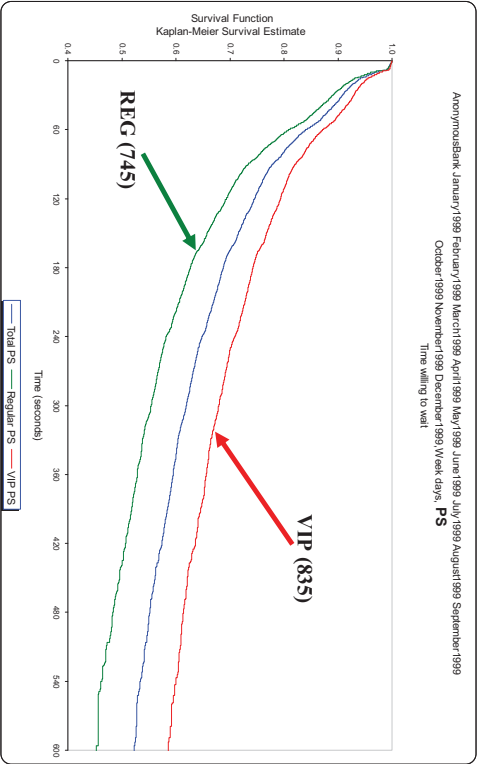


Summary of the Number of Censored and Uncensored Values				
Failure Time: Unhandled Wait Time: Censored Time: Handled Wait Time				
Class	Number of Cases	Failed (Abandoned)	Censored (Served)	Percent Censored
Total PS	164817	33006	131811	79.97
priority_1 PS	57007	15206	41801	73.33
priority_2 PS	104762	16042	88720	84.69

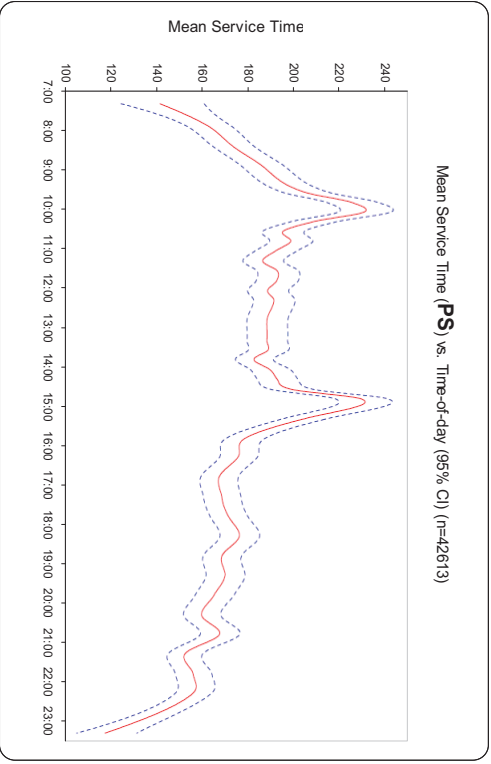
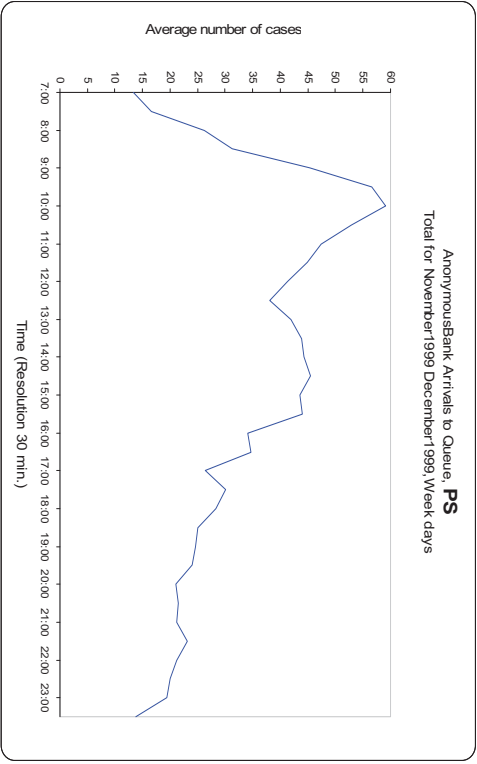
Hazard Rate Function (PS)



PS (VIP, REG) Customers: (Im)Patience

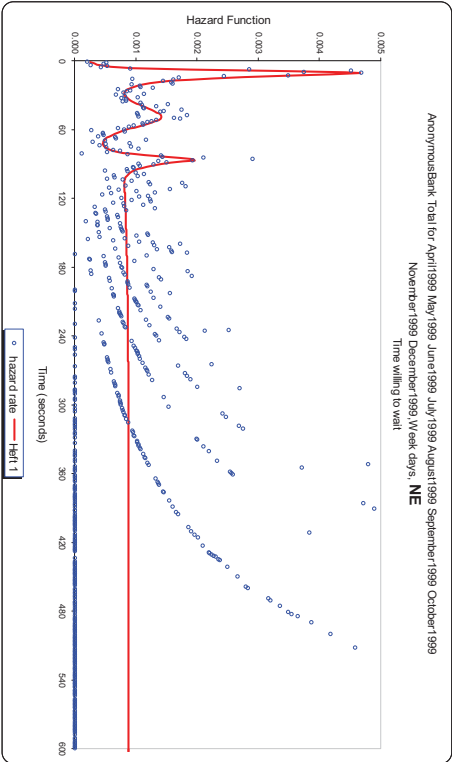
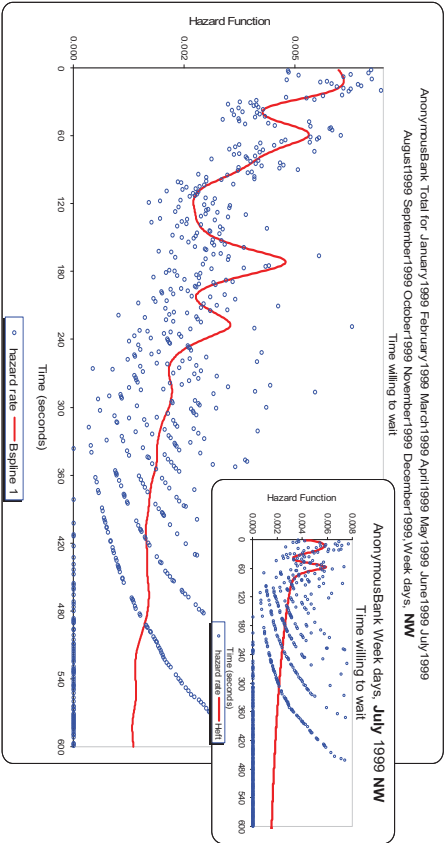


(Im)Patience Behind the Scene

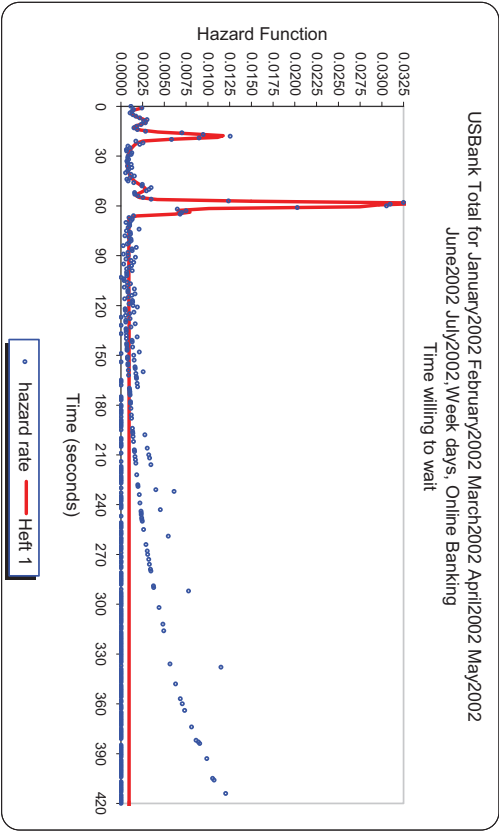
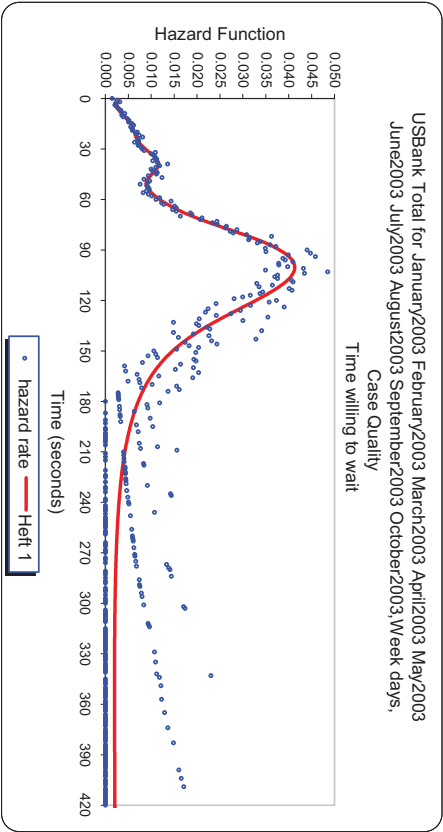


Hazard Rate Function (NW, NE)

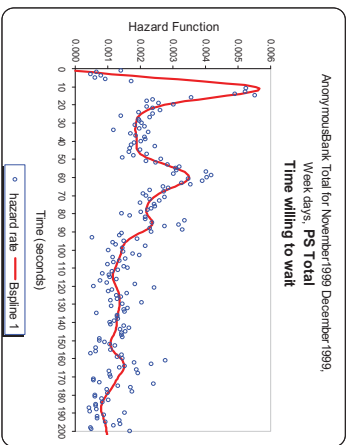
Summary of the Number of Censored and Uncensored Values				
Failure Time: Unhandled Wait Time		Censored Time: Handled Wait Time		
group	Number of cases	Failed	Censored	Percent Censored
NW	14709	6986	7823	53.19
NE	19483	2397	17086	87.70



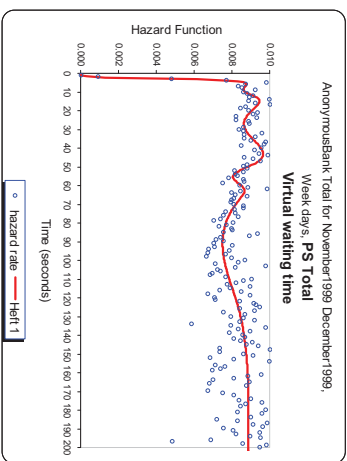
Hazard Rate Function (Case Quality, Online Banking)



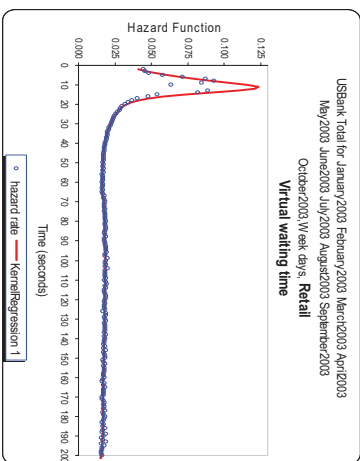
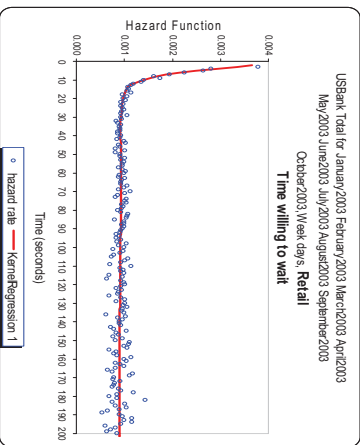
Time Willing to Wait (τ)



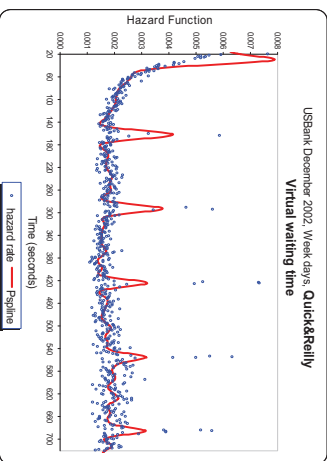
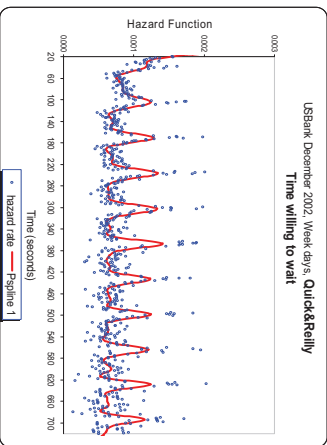
Time Required to Wait (τ')



USA
Retail



USA
Stocks



Psychology

Psychology + Protocols

