Supplementary Material for: Waiting To Give: Stated and Revealed Preferences

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Contents

List of Tables

List of Figures

Supplementary Material A

Additional Tables and Figures

Supplemental Table S1: Additional Outcome Variables: Satisfaction with Length of Time and Made Appointment

	Intention to Return	Satisfaction with Wait	Made Appointment	Intention to Return	Satisfaction with Wait	Made Appointment
Wait	-0.003***	-0.01***	-0.003**	-0.002*	-0.006***	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Yearly Donation Rate	0.14***	-0.02	0.01	0.13***	-0.01	0.008
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Female	0.08**	0.08**	0.09**	0.08**	0.06*	0.08*
	(0.04)	(0.03)	(0.05)	(0.03)	(0.04)	(0.05)
Older than 65 years	0.13	0.16**	0.03	0.08	0.08	0.03
	(0.09)	(0.06)	(0.07)	(0.09)	(0.06)	(0.07)
Observations	565	842	439	565	842	439
Emotions	N	N	N	p-value<.01	p-value<.0001	p-value=.25
Attitudes	N	N	N	p-value<.01	p-value=.21	p-value<.01
Center Fixed Effects	Y	Y	Y	Y	Y	Y
Day of Week Fixed Effects	Y	Y	Y	Y	Y	Y
Time of Day Fixed Effects	Y	Y	Y	Y	Y	Y
AB Pos & O Neg	Y	Y	Y	Y	Y	Y

Marginal Coefficients from Ordered Probit (col (1), (2), (4), (5)) and Probit (col (3) and (6)) Regressions. Col (1) and (3) restrict the sample to those survey respondents that do not make a follow-up appointment at the time of the survey (or who were not asked to make a follow-up appointment). In col (1) - (3) we include the main set of variables and in col (4) - (6) we include the emotions and attitude variables. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S2: Effect of Wait Times, robust to appointments and proximity to center

	Likelihood to Return			
	Whole blood & Plasma		Whole blood only	
$\widetilde{Wait}$	-0.004**	-0.005**	-0.005**	-0.006**
	(0.002)	(0.002)	(0.003)	(0.003)
Appointment	0.23**	.	0.35***	.
	(0.1)		(0.13)	
distance	.	0.0006**	.	0.0006**
		(0.0003)		(0.0003)
Yearly Donation Rate	0.24***	0.24***	0.35***	0.34***
	(0.04)	(0.05)	(0.07)	(0.08)
Female	-0.13*	-0.09	-0.18*	-0.12
	(0.07)	(0.07)	(0.1)	(0.09)
Older than 65 years	0.26***	0.26***	0.53***	0.55***
	(0.1)	(0.1)	(0.19)	(0.19)
ABPOS	0.13	0.1	0.07	-0.003
	(0.19)	(0.19)	(0.27)	(0.27)
ONEG	0.06	0.08	0.18	0.19
	(0.11)	(0.1)	(0.16)	(0.15)
Observations	839	836	767	766
Log Likelihood	-1279.76	-1277.17	-1619.98	-1629.45
Ancillary Parameter ($\hat{p}$)	-0.004	-0.004	-0.007	-0.007
Center Fixed Effects	Y	Y	Y	Y
Day of Week Fixed Effects	Y	Y	Y	Y
Time of Day Fixed Effects	Y	Y	Y	Y
AB Pos & O Neg	Y	Y	Y	Y

Coefficients from Gompertz hazard model. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S3: Correlation in Wait Times, by Center

	Current Wait				Next Wait			
	By Center							
	A	B	C	D	A	B	C	D
Previous Wait	0.05	0.2***	0.002	0.2	.	.	.	.
	(0.05)	(0.05)	(0.05)	(0.32)				
Current Wait	.	.	.	.	0.09	0.07	0.25	-0.1
					(0.06)	(0.05)	(0.43)	(0.2)
Constant	37.10***	43.22***	46.60***	19.82	35.46***	32.76***	35.69**	37.83***
	(3.31)	(4.05)	(7.06)	(14.80)	(4.68)	(3.29)	(14.13)	(7.96)
Observations	386	229	19	16	410	234	20	19
R^2	0.11	0.09	0.52	0.2	0.02	0.02	0.33	0.07
Day of Week Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Time of Day Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y

OLS regressions. Outcome variable: column (1)-(4) current wait time; column (5)-(8) subsequent wait time. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S4: Placebo Test of Wait Time and Duration

	Current Duration	Previous Duration	Current Duration
$\widetilde{Wait}$	1.97**	0.38	.
	(1.01)	(0.44)	
Next Wait	.	.	0.11
			(0.29)
Yearly Donation Rate	-98.39***	-70.19***	-27.34***
	(17.79)	(8.52)	(4.61)
Female	33.31	-1.88	0.07
	(32.21)	(13.40)	(9.98)
Older than 65 years	-105.98***	-27.36**	-13.23
	(36.34)	(12.14)	(9.27)
Constant	519.65***	282.93***	159.85***
	(99.37)	(33.65)	(24.54)
Observations	848	750	677
R^2	0.09	0.16	0.07
Center Fixed Effects	Y	Y	Y
Day of Week Fixed Effects	Y	Y	Y
Time of Day Fixed Effects	Y	Y	Y
AB Pos & O Neg	Y	Y	Y

Linear regression coefficients. Col (1) repeats the analysis from Table S7 for comparison and accounts for the right-censoring in the data. The sample in Col (2) are those donors who donated during the survey period and donated once before and returned. The sample in Col (3) are those donors who donated during the survey time and returned to donate at some subsequent time. Col (2) and (3) do not have censored observations and are therefore estimated via OLS. Outcome variable is the duration (number of days) beyond eligibility until the donor returns for the current donation, the previous donation and the subsequent donation, respectively. Col (2) shows that the current wait does not predict the previous duration, while col (3) shows that the wait time the donor experiences on his subsequent donation does not affect his current duration. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S5: Effect of Wait Times with Unobserved Heterogeneity

	Survey donors		All donors	
	Likelihood to Return	Likelihood to Return	Likelihood to Return	Likelihood to Return
$\widetilde{Wait}$	-0.005**	-0.005**	-0.003***	-0.003**
	(0.002)	(0.002)	(0.001)	(0.001)
Yearly Donation Rate	0.24***	0.24***	0.28***	0.26***
	(0.05)	(0.04)	(0.03)	(0.02)
Female	-0.09	-0.09	-0.17***	-0.18***
	(0.07)	(0.08)	(0.04)	(0.05)
Older than 65 years	0.26***	0.26**	0.15**	0.13
	(0.1)	(0.12)	(0.07)	(0.08)
Observations	848	848	2390	2390
Log Likelihood	-1295.83	-1295.83	-3669.25	-3668.08
Ancillary Parameter ($\hat{p}$)	-0.004	-0.004	-0.003	-0.003
Center Fixed Effects	Y	Y	Y	Y
Day of Week Fixed Effects	Y	Y	Y	Y
Time of Day Fixed Effects	Y	Y	Y	Y
AB Pos & O Neg	Y	Y	Y	Y

Supplemental Table S6: Coefficients from a proportional hazard model with unobserved heterogeneity. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S7: Average Effect of Wait Times, OLS Regression

	Survey donors			All donors	
	Duration, days delayed until return				
$\widehat{Wait}$	2.54***	1.97**	2.02**	2.13***	1.35**
	(0.95)	(1.01)	(1.01)	(0.57)	(0.62)
Yearly Donation Rate	.	-98.39***	-90.34***	.	-112.63***
		(17.79)	(17.77)		(13.44)
Female	.	33.31	39.69	.	73.55***
		(32.21)	(32.46)		(19.70)
Older than 65 years	.	-105.98***	-86.81**	.	-61.06**
		(36.34)	(34.68)		(27.86)
Pos. about Wait	.	.	14.66	.	.
			(22.66)		
Neg. while Waiting	.	.	41.07	.	.
			(27.15)		
Pos. while Waiting	.	.	-13.74	.	.
			(23.56)		
Pos. Donation Attitude	.	.	-44.05**	.	.
			(19.77)		
Pos. View of Blood Service	.	.	-41.21*	.	.
			(22.25)		
Acceptable Wait Time	.	.	21.66	.	.
			(13.30)		
Constant	333.20***	519.65***	385.31***	354.54***	467.93***
	(16.52)	(99.37)	(127.35)	(10.08)	(53.14)
Observations	848	848	848	2388	2388
R^2	0.01	0.09	0.11	0.006	0.11
Center Fixed Effects	N	Y	Y	N	Y
Day of Week Fixed Effects	N	Y	Y	N	Y
Time of Day Fixed Effects	N	Y	Y	N	Y
AB Pos & O Neg	N	Y	Y	N	Y
Emotions & Attitudes	N	N	Y	N	N

OLS coefficients. Outcome variable is the duration (number of days) beyond eligibility until the donor returns. Donors who are right-censored are coded as returning the day after we stopped observing donors' behavior (day 1,461). Col (1) can be interpreted as a 20 minute increase in average wait time results in a nearly 50 day delay. The estimated effect of wait time increases if we increase the duration of the non-return donors. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S8: Average Effect of Wait Times, Tobit Regression

	Survey donors			All donors	
	Duration, days delayed until return				
$\widetilde{Wait}$	2.96***	2.29**	2.37**	2.51***	1.60**
	(1.14)	(1.20)	(1.19)	(0.69)	(0.73)
Yearly Donation Rate	.	-112.02***	-102.21***	.	-129.07***
		(20.69)	(20.57)		(15.88)
Female	.	38.20	45.36	.	85.32***
		(37.61)	(37.80)		(23.40)
Older than 65 years	.	-119.91***	-96.23**	.	-68.31**
		(41.48)	(39.39)		(32.20)
Pos. about Wait	.	.	18.77	.	.
			(26.25)		
Neg. while Waiting	.	.	50.81	.	.
			(33.03)		
Pos. while Waiting	.	.	-17.47	.	.
			(27.72)		
Pos. Donation Attitude	.	.	-51.78**	.	.
			(23.35)		
Pos. View of Blood Service	.	.	-47.58*	.	.
			(26.75)		
Acceptable Wait Time	.	.	26.16*	.	.
			(15.34)		
Constant	365.47***	581.62***	418.82***	391.03***	523.31***
	(21.66)	(117.16)	(147.27)	(13.42)	(63.59)
Observations	848	848	848	2388	2388
Pseudo R^2	0.0007	0.007	0.008	0.0005	0.008
Center Fixed Effects	N	Y	Y	N	Y
Day of Week Fixed Effects	N	Y	Y	N	Y
Time of Day Fixed Effects	N	Y	Y	N	Y
AB Pos & O Neg	N	Y	Y	N	Y
Emotions & Attitudes	N	N	Y	N	N

Linear regression coefficients with right-censored observations at 1440 days. Outcome variable is the duration (number of days) beyond eligibility until the donor returns. Col (1) can be interpreted as a 20 minute increase in average wait time results in a nearly 60 day delay. The estimated effect of wait time increases if we increase the duration of the non-return donors. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S9: Average Effect of Wait Times, Probit Regression

	Survey donors		All donors	
	Likelihood to Return in 50 days	Likelihood to Return in 100 days	Likelihood to Return in 50 days	Likelihood to Return in 100 days
$\widehat{Wait}$	-0.0003	-0.0009	-0.0003**	-0.001*
	(0.0003)	(0.001)	(0.0002)	(0.0006)
Yearly Donation Rate	0.007	0.13***	0.02***	0.16***
	(0.005)	(0.02)	(0.003)	(0.01)
Female	-0.01	-0.06	-0.004	-0.07***
	(0.01)	(0.04)	(0.006)	(0.02)
Older than 65 years	-0.03***	0.09	-0.03***	0.02
	(0.009)	(0.06)	(0.004)	(0.04)
Observations	796	848	2388	2388
Pseudo R^2	0.12	0.09	0.14	0.1
Center Fixed Effects	Y	Y	Y	Y
Day of Week Fixed Effects	Y	Y	Y	Y
Time of Day Fixed Effects	Y	Y	Y	Y
AB Pos & O Neg	Y	Y	Y	Y

Marginal effects from probit regressions. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S10: Effect of Wait Times, robustness to specification

	Survey donors		All donors	
	Likelihood to Return Cox PH Model Semi-Parametric	Likelihood to Return Log-Logistic Parametric	Likelihood to Return Cox PH Model Semi-Parametric	Likelihood to Return Log-Logistic Parametric
$\widetilde{Wait}$	-0.005**	0.004*	-0.004**	0.003**
	(0.002)	(0.003)	(0.002)	(0.002)
Yearly Donation Rate	0.28***	-0.31***	0.34***	-0.37***
	(0.06)	(0.04)	(0.03)	(0.03)
Female	-0.12	0.07	-0.19***	0.18***
	(0.07)	(0.08)	(0.04)	(0.05)
Older than 65 years	0.34***	-0.16**	0.19**	-0.03
	(0.13)	(0.08)	(0.09)	(0.06)
AB Positive	0.16	-0.25	0.07	-0.15
	(0.2)	(0.22)	(0.13)	(0.15)
O Negative	0.1	-0.07	0.17**	-0.14**
	(0.12)	(0.11)	(0.07)	(0.07)
Constant	.	5.43***	.	5.37***
		(0.25)		(0.14)
Observations	848	848	2389	2389
Log Likelihood	-4333.38	-1353.02	-14141.89	-3837.17
Center Fixed Effects	Y	Y	Y	Y
Day of Week Fixed Effects	Y	Y	Y	Y
Time of Day Fixed Effects	Y	Y	Y	Y
AB Pos & O Neg	Y	Y	Y	Y

Col (1) & (3) replicates Table 4 of main text using a semi-parametric Cox proportional hazard model. The semi-parametric model does not parameterize the baseline hazard and thus the estimates do not suffer from potential mis-specification. Col (2) & (4) replicates Table 4 in main text with log-logistic parametrization, Time Ratios Reported. The log-logistic function permits non-monotonic hazard functions; (2) . Center, day of week, time of day fixed effects included and dummies for AB Positive and O Negative blood types. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S11: Discrete Time Hazard and IV Estimators: Likelihood to Return, All Donors

	Discrete Time Hazard	IV Estimator Control Function Estimation	IV Estimator GMM Estimation
$\widetilde{\text{Wait}}$	-0.003**	-0.006***	-0.007**
	(0.002)	(0.003)	(0.005)
Donation History	0.41***	0.40***	0.40***
	(0.04)	(0.05)	(0.02)
Female	-0.20*	-0.20	-0.21**
	(0.05)	(0.05)	(0.05)
Older than 65 years	0.17*	0.18**	0.18**
	(0.10)	(0.09)	(0.09)
AB Positive	0.10	0.11	0.11
	(0.14)	(0.14)	(0.14)
O Negative	0.18**	0.19**	0.19**
	(0.08)	(0.08)	(0.08)
Residual	.	-.005	.
		(0.003)	
Constant	-2.47***	-2.15***	-2.14***
	(0.18)	(0.24)	(0.18)
Observations	58,087	60,473	60,365
Log Likelihood	-7405.30	.	.

Col (1) Coefficients of the discrete time hazard model estimated via logistic regression. Col (2) Coefficients from second stage of the IV estimation, using the control function approach and standard errors bootstrapped with 199 replications. Col (3) Coefficients from IV estimation, using a one-step GMM estimation. Center fixed effects, time of day, and day of week. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Given that we have a directional hypothesis for the effect of wait time, the estimates on $\widetilde{Wait}$ are one-tailed; all other coefficient tests are two-tailed.

Supplemental Table S12: Factor Loadings, Emotions and Attitudes

	Feelings about waiting experience	
	Factor 1	
pleasant	0.8857	
enjoyable	0.8529	
fair	0.8965	
reasonable	0.8908	
	Feelings while waiting	
	Factor 1	Factor 2
relaxed	-0.2127	0.9163
calm	-0.2053	0.9279
annoyed	0.8803	-0.1837
angry	0.9272	-0.1373
frustrated	0.9126	-0.1937
upset	0.8857	-0.2073
content	-0.1019	0.7651
	Attitudes towards Blood Donation	
	Factor1	
loss if gave up	0.6400	
means more to me than just donating	0.7191	
important part of me	0.7999	
moral obligation to donate	0.7787	
personality responsibility to donate	0.8265	
social obligation to donate	0.6808	
	Attitudes towards Blood Service	
	Factor1	
high integrity	0.8587	
counted on to do what's right	0.8816	
honest & truthful	0.8558	
fast efficient procedures	0.7160	
highly competent	0.8650	
knows what they're doing	0.8925	

Factor loadings were estimated using principal factor analysis.

Supplemental Table S13: Effect of Wait Times, robustness to specification, whole blood donors only

	Survey donors Likelihood to Return Cox PH Model Semi-Parametric	All donors Likelihood to Return Cox PH Model Semi-Parametric
$\widetilde{Wait}$	-0.005**	-0.003**
	(0.003)	(0.002)
Yearly Donation Rate	0.29***	0.37***
	(0.06)	(0.05)
Female	-0.11	-0.18***
	(0.08)	(0.05)
Older than 65 years	0.45***	0.27***
	(0.14)	(0.1)
AB Positive	0.06	-0.0002
	(0.23)	(0.15)
O Negative	0.15	0.22***
	(0.12)	(0.07)
Observations	776	2198
Log Likelihood	-3849.75	-12682.98
Center Fixed Effects	Y	Y
Day of Week Fixed Effects	Y	Y
Time of Day Fixed Effects	Y	Y
AB Pos & O Neg	Y	Y

Coefficients from a Cox proportional hazard model, replicating Table 7. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S14: Effect of Wait on Total Donations

	Survey Donors, Whole Blood		Survey Donors, All		All Donors	
Total Donations over Next 48 months						
$\widetilde{Wait}$	-0.01***	-0.01**	-0.01**	-0.01**	-0.007**	-0.01***
	(0.006)	(0.006)	(0.005)	(0.006)	(0.003)	(0.003)
Yearly Donation Rate	1.21***	0.96***	1.14***	0.96***	0.84***	0.49***
	(0.14)	(0.11)	(0.13)	(0.11)	(0.13)	(0.11)
Female	-0.22	-0.16	-0.19	-0.16	-0.39***	-0.42***
	(0.19)	(0.18)	(0.19)	(0.18)	(0.11)	(0.11)
Older than 65 years	0.75**	0.72**	0.96***	0.72**	1.28***	1.22***
	(0.36)	(0.28)	(0.36)	(0.28)	(0.27)	(0.24)
Constant	2.01***	.	1.83***	.	2.28***	.
	(0.57)		(0.57)		(0.33)	
Observations	776	848	848	848	2387	2387
R^2	0.28	.	0.26	.	0.2	.
Pseudo R^2	.	0.12	.	0.12	.	0.08
Center Fixed Effects	Y	Y	Y	Y	Y	Y
Day of Week Fixed Effects	Y	Y	Y	Y	Y	Y
Time of Day Fixed Effects	Y	Y	Y	Y	Y	Y
AB Pos & O Neg	Y	Y	Y	Y	Y	Y

Col (1), (3), (5) are OLS coefficients. Col (2), (4), (6) are marginal effects from Poisson regressions. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Given that we have a directional hypothesis for the effect of wait time, the estimates on $\widetilde{Wait}$ are one-tailed; all other coefficient tests are two-tailed.

Supplemental Table S15: Proportional Hazards with Competing Risks

	Survey Donors			All Donors		
$\widetilde{Wait}\times$ Return to WB	-0.005**	-0.005*	-0.005**	-0.005***	-0.004**	-0.004**
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)
$\widetilde{Wait}\times$ Return to P	-0.01**	-0.01**	-0.01*	-0.01***	-0.01***	-0.01**
	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)
Yearly Donation Rate	.	0.34***	.	.	0.38***	.
		(0.07)			(0.04)	
Female	.	-0.13	.	.	-0.22***	.
		(0.09)			(0.05)	
Older than 65 years	.	0.51***	.	.	0.38***	.
		(0.18)			(0.12)	
Yearly Donation Rate × Return to WB	.	.	0.34***	.	.	0.42***
			(0.08)			(0.06)
Yearly Donation Rate × Return to P	.	.	0.31***	.	.	0.38***
			(0.12)			(0.04)
Female × Return to WB	.	.	-0.12	.	.	-0.19***
			(0.09)			(0.06)
Female × Return to P	.	.	-0.24	.	.	-0.38**
			(0.26)			(0.16)
Older than 65 years × Return to WB	.	.	0.62***	.	.	0.45***
			(0.19)			(0.13)
Older than 65 years × Return to P	.	.	-1.85*	.	.	-2.53**
			(1.01)			(1.01)
AB Positive × Return to WB	.	.	-0.07	.	.	-0.07
			(0.25)			(0.16)
AB Positive × Return to P	.	.	0.77**	.	.	0.67**
			(0.39)			(0.3)
O Negative × Return to WB	.	.	0.21	.	.	0.24***
			(0.15)			(0.09)
O Negative × Return to P	.	.	-0.64	.	.	-0.24
			(0.6)			(0.3)
Constant	-4.20***	-4.86***	-4.85***	-4.32***	-4.71***	-4.79***
	(0.07)	(0.28)	(0.3)	(0.04)	(0.15)	(0.16)
Observations	1649	1649	1649	4653	4653	4653
Log Likelihood	-2141.68	-2058.27	-2037.46	-6123.09	-5839.65	-5805.94
Ancillary Parameter ($\hat{p}$)	.	.	.	.	.	.
Center Fixed Effects	N	Y	Y	N	Y	Y
Day of Week Fixed Effects	N	Y	Y	N	Y	Y
Time of Day Fixed Effects	N	Y	Y	N	Y	Y
AB Pos & O Neg	N	Y	Y	N	Y	Y
$\hat{p}$ Return to Plasma	-.006***	-.005***	-.006***	-.003**	-.003**	-.003**
Constant		-.007***	-.007***	-.007***	-.007***	-.007***

Coefficients of Survival model with Gompertz parametrization. Robust Standard Errors clustered at the donor-level in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Given that we have a directional hypothesis for the effect of wait time, the estimates on $\widetilde{Wait}$ are one-tailed; all other coefficient tests are two-tailed. Donors who returned to give plasma before they were eligible to return to give whole blood are never "at risk" of returning to whole blood.

Supplemental Table S16: Proportional Hazards Coefficient, Gender Effects

	Survey Donors		Survey Donors, WB only		Survey Donors				All Donors
	Satisfaction	Intention	Return	Return	Return	Return	Return	Return	Return
$\widetilde{Wait}$	.	.	-0.01***	0.001	.	.	.	.	.
			(0.003)	(0.003)					
$\widetilde{Wait}$ × Male	-0.003***	-0.002**	.	.	-0.009***	-0.008***	.	.	.
	(0.001)	(0.001)			(0.003)	(0.003)			
$\widetilde{Wait}$ × Fem	-0.006***	-0.002**	.	.	-0.0006	0.0003	.	.	.
	(0.001)	(0.001)			(0.003)	(0.003)			
$\widetilde{Wait}$× Male × Return to WB	.	.	.	.	.	.	-0.009***	-0.01***	-0.009***
							(0.003)	(0.004)	(0.002)
$\widetilde{Wait}$× Male × Return to P	.	.	.	.	.	.	-0.009	-0.005	-0.003
							(0.01)	(0.009)	(0.003)
$\widetilde{Wait}$× Female × Return to WB	.	.	.	.	.	.	0.001	0.002	-0.0009
							(0.003)	(0.004)	(0.002)
$\widetilde{Wait}$× Female × Return to P	.	.	.	.	.	.	-0.02**	-0.02**	-0.003
							(0.008)	(0.01)	(0.004)
Yearly Donation Rate	-0.02	0.13***	.	.	.	0.24***	.	.	.
	(0.01)	(0.01)				(0.04)			
Female	0.06*	0.07***	.	.	.	-0.08	.	.	.
	(0.03)	(0.03)				(0.07)			
Older than 65 years	0.1*	0.04	.	.	.	0.27***	.	.	.
	(0.06)	(0.06)				(0.1)			
AB Positive	0.02	0.06	.	.	.	0.18	.	.	.
	(0.08)	(0.07)				(0.18)			
O Negative	0.02	-0.02	.	.	.	0.09	.	.	.
	(0.05)	(0.05)				(0.1)			
Yearly Donation Rate × Return to WB	.	.	.	.	.	.	.	0.35***	0.09**
								(0.07)	(0.03)
Yearly Donation Rate × Return to P	.	.	.	.	.	.	.	0.29**	0.28***
								(0.11)	(0.01)
Female × Return to WB	.	.	.	.	.	.	.	-0.11	-0.24***
								(0.09)	(0.05)
Female × Return to P	.	.	.	.	.	.	.	-0.34	-0.2**
								(0.27)	(0.09)
Older than 65 years × Return to WB	.	.	.	.	.	.	.	0.62***	0.64***
								(0.19)	(0.12)
Older than 65 years × Return to P	.	.	.	.	.	.	.	1.85*	-0.26
								(1.01)	(0.22)
AB Positive × Return to WB	.	.	.	.	.	.	.	-0.001	-0.22
								(0.26)	(0.15)
AB Positive × Return to P	.	.	.	.	.	.	.	0.71*	0.5***
								(0.4)	(0.16)
O Negative × Return to WB	.	.	.	.	.	.	.	0.23	0.25**
								(0.15)	(0.1)
O Negative × Return to P	.	.	.	.	.	.	.	-0.65	-0.54**
								(0.61)	(0.27)
Constant	.	.	-4.08***	-4.29***	-4.93***	-5.46***	-4.21***	-4.92***	-4.24***
			(0.09)	(0.1)	(0.04)	(0.21)	(0.07)	(0.29)	(0.15)
Observations	848	848	416	360	848	848	1649	1649	5584
Log Likelihood	.	.	-934.66	-786.09	-1333.37	-1293.82	-2138	-2032.88	-8473.9
Ancillary Parameter ($\hat{p}$)	.	.	-0.008	-0.008	-0.004	-0.004	.	.	.
χ^2 test: Wait× Male=Wait× Fem	2.36	.00	.	.	5.16**	4.49**			
χ^2 test: Wait× Male WB=Wait× Male P							.00	.25	2.96*
χ^2 test: Wait× Fem WB=Wait× Fem P							6.02**	4.92**	.23

Col (1) & (2) present marginal coefficients from an ordered probit regressions. Cols (3)-(6) present coefficients of Survival model with Gompertz parametrization. Columns (7)-(9) present coefficients from a competing risks hazard model with Gompertz parametrization. Center fixed effects, time of day, day of week, and dummies for AB Positive and O Negative blood types included. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Given that we have a directional hypothesis for the effect of wait time, the estimates on $\widetilde{Wait}$ are one-tailed; all other coefficient tests are two-tailed.

Supplemental Table S17: Effect of Wait Times on Plasma Conversion by Gender

	$Pr\left[Plasma = 1\right]$	
	Survey donors	All donors
$\widetilde{Wait}$ × Male	-0.0003	-0.0002
	(0.0006)	(0.0004)
$\widetilde{Wait}$ × Fem	-0.002**	-0.0005
	(0.0007)	(0.0004)
Female	0.04	-0.0007
	(0.04)	(0.02)
Older than 65 years	-0.07***	-0.08***
	(0.01)	(0.006)
AB Positive	0.11	0.07*
	(0.07)	(0.04)
O Negative	-0.04*	-0.007
	(0.02)	(0.02)
Constant	.	.
Observations	843	2388
Pseudo R^2	0.09	0.08
Center Fixed Effects	Y	Y
Day of Week Fixed Effects	Y	Y
Time of Day Fixed Effects	Y	Y
AB Pos & O Neg	Y	Y

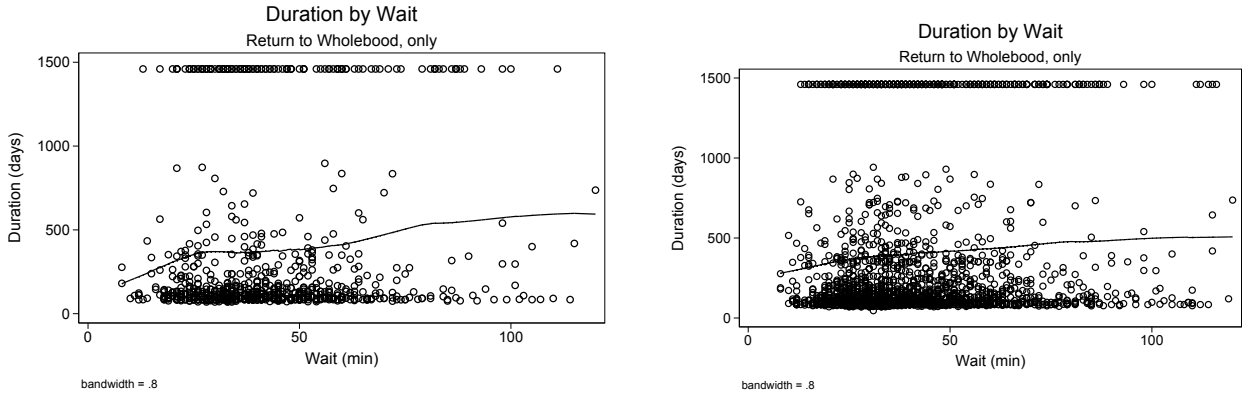
Marginal Coefficients from Probit Regressions. Outcome variable takes a value of 1 if the donor converted to plasma on the subsequent donation and 0 otherwise. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Supplemental Table S18: Donation frequency and wait time effects

	Survey donors				All donors			
$\widetilde{Wait}$	-0.004**	-0.006***	-0.003*	-0.004**	-0.004***	-0.006***	-0.003**	-0.004***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Frequent Lifetime Donor (75th pct, donations)	0.49***	0.39**	.	.	0.54***	0.45***	.	.
	(0.18)	(0.19)			(0.11)	(0.11)		
$\widetilde{Wait}\times$ Frequent Lifetime Donor	0.002	0.002	.	.	0.004*	0.004*	.	.
	(0.004)	(0.004)			(0.002)	(0.002)		
$\widetilde{Wait}\times$ New Donor	.	.	-0.005	-0.005	.	.	0.001	0.0002
			(0.006)	(0.006)			(0.004)	(0.004)
New Donor	.	.	-0.41***	-0.36**	.	.	-0.63***	-0.59***
			(0.14)	(0.14)			(0.08)	(0.08)
Female	.	-0.12*	.	-0.17**	.	-0.19***	.	-0.27***
		(0.07)		(0.07)		(0.04)		(0.04)
Older than 65 years	.	0.26***	.	0.47***	.	0.15**	.	0.36***
		(0.09)		(0.09)		(0.07)		(0.06)
AB Positive	.	0.07	.	0.16	.	-0.02	.	0.09
		(0.19)		(0.19)		(0.13)		(0.13)
O Negative	.	0.11	.	0.13	.	0.2***	.	0.21***
		(0.1)		(0.1)		(0.06)		(0.06)
Constant	-5.12***	-5.12***	-4.88***	-4.91***	-5.19***	-5.04***	-4.93***	-4.75***
	(0.05)	(0.19)	(0.04)	(0.2)	(0.03)	(0.1)	(0.02)	(0.1)
Observations	848	848	848	848	2388	2388	2388	2388
Log Likelihood	-1310.47	-1302.36	-1329.37	-1311.43	-3732.79	-3710.45	-3779.21	-3731.38
Ancillary Parameter ($\hat{p}$)	-0.004	-0.004	-0.004	-0.004	-0.003	-0.003	-0.004	-0.003
χ^2 test: Wait+Wait$\times$ Frequent Donor=0	.30	.80		.	.11	.81	.	
χ^2 test: Wait+Wait$\times$ New Donor=0				1.96	3.43		.32	1.35

Hazard model with Gompertz parametrization. Robust Standard Errors in parentheses and *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Given that we have a directional hypothesis for the effect of wait time, the estimates on $\widetilde{Wait}$ are one-tailed; all other coefficient tests are two-tailed.

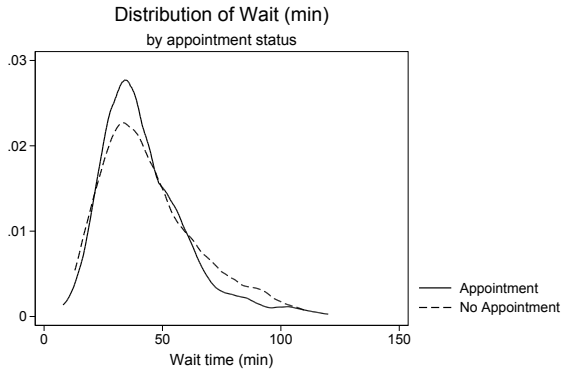
Supplemental Figure S1: Duration by Wait Time, Whole Blood Only



(a) Survey Donors (b) All Donors

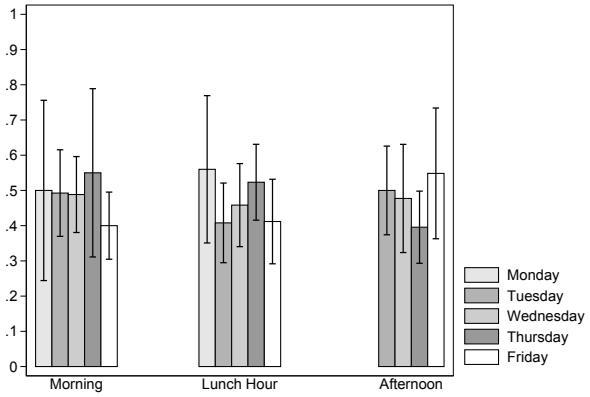
Non-parametric regression of Duration until next donation by wait time.

Supplemental Figure S2: Distribution of Wait time by appointment status

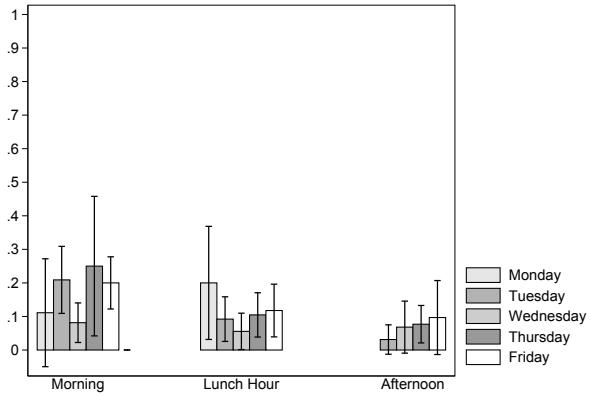


The Kolmogorov-Smirnov equality-of-distributions test cannot reject the null that the distributions are the same (p-value=.38); The Kruskal-Wallis equality-of-populations rank test cannot reject the null that the distribution are drawn from the same population (p-value=.27).

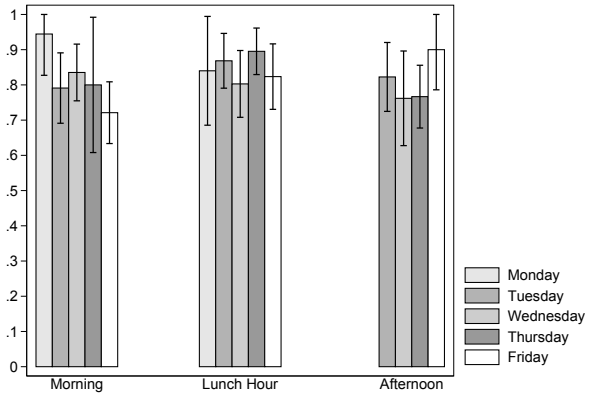
Supplemental Figure S3: Arrivals, pooled across centers



(a) Percent of Female Donors

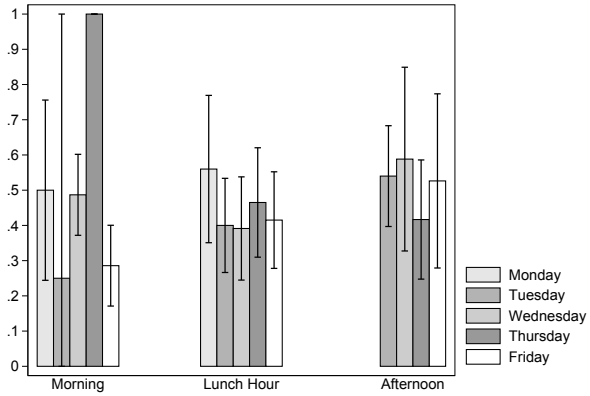


(b) Percent of Donors over 65 years

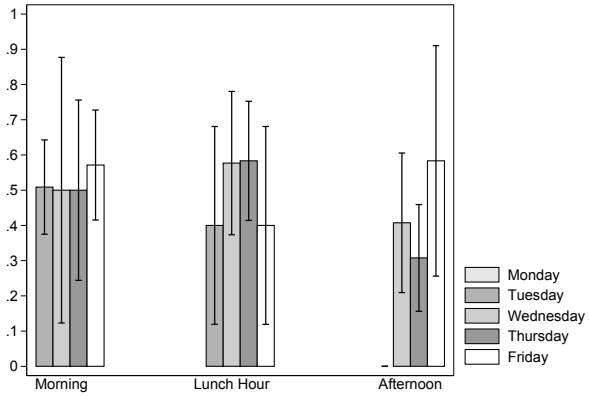


(c) Percent with Appointments

Supplemental Figure S4: Arrivals by Gender

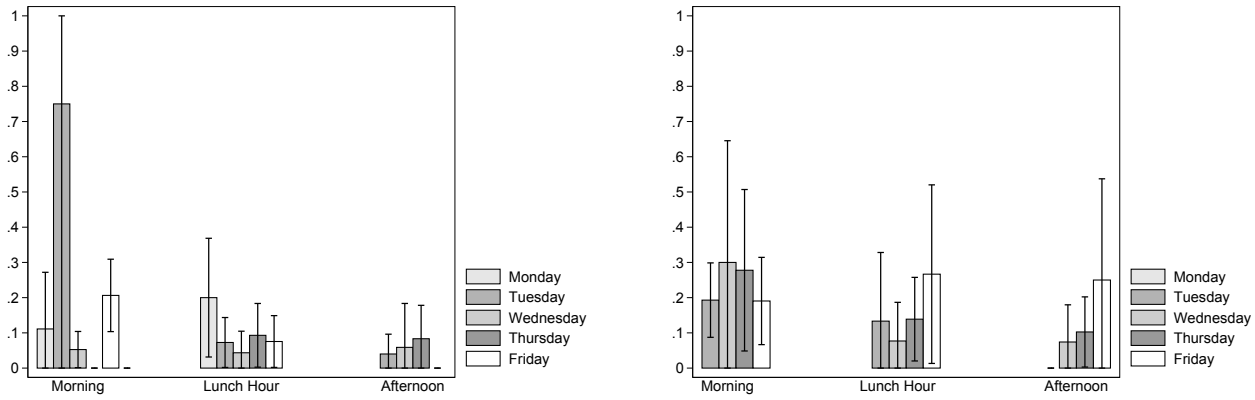


(a) Center A



(b) Center D

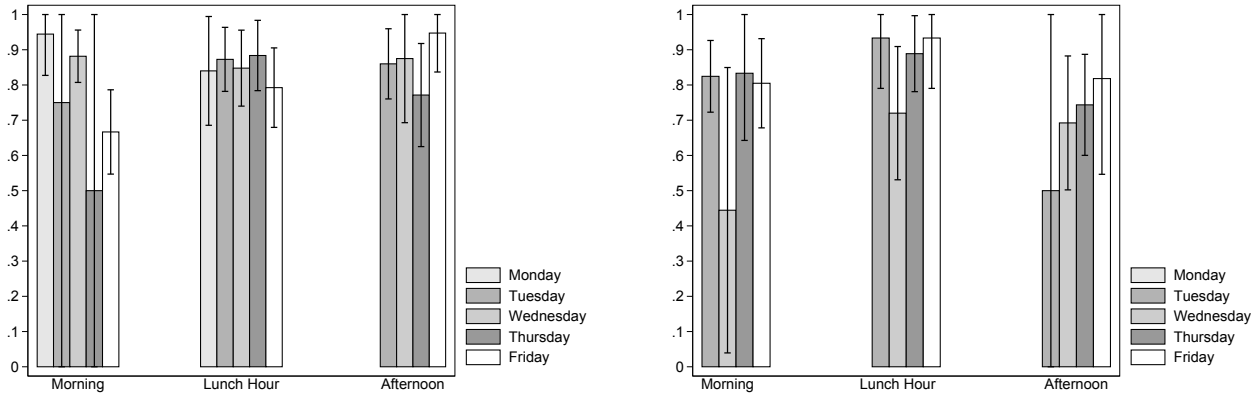
Supplemental Figure S5: Arrivals by Age



(a) Center A

(b) Center D

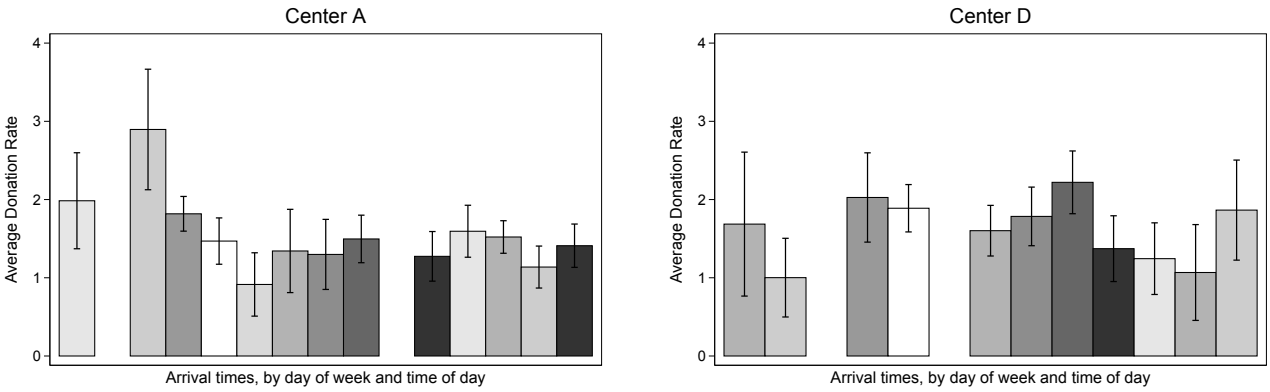
Supplemental Figure S6: Arrivals by Appointments



(a) Center A

(b) Center D

Supplemental Figure S7: Donation Frequency and Strategic Arrivals



(a) Center A

(b) Center D

Each bar represents a day of week-time of day combination, listed in order from the shortest historical wait times to the longest historical waits times. At center A, the list of the 15 time blocks from shortest to longest historical wait times is as follows: Monday PM, Monday AM, Wednesday AM, Friday PM, Tuesday PM, Thursday AM, Friday AM, Monday Lunch, Thursday Lunch, Tuesday AM, Wednesday PM, Wednesday Lunch, Tuesday Lunch, Friday Lunch. At center D, the equivalent list is: Monday AM, Monday PM, Tuesday AM, Wednesday AM, Friday AM, Friday PM, Wednesday PM, Monday Lunch, Tuesday Lunch, Thursday AM, Thursday PM, Thursday Lunch, Wednesday Lunch, Tuesday PM, Friday Lunch. The y-axis is the average yearly donation rate of donors in our sample who arrived to donate at each day-time combination.

Supplementary Material B

Conceptual Model

Equation 1 is the first order condition resulting from the maximization of Equation 3 in the main text.

$$ln(\beta)\left[1-(\beta\delta)^{t^*}\right]-\delta^{t^*}ln(\beta\delta)\left[1-\beta^{t^*}\right]=\frac{f(c_0^i)(1-\beta\delta)ln(\beta)}{u(b^i)} \tag{1}$$

Implicitly differentiating 1, it is straightforward to show that t^* increases as the cost of the last donation c_0^i increases and the benefits of donating decrease:

$$\frac{\partial t^*}{\partial c_0^i}=-\frac{f'(c_0^i)(1-\beta\delta)ln(\beta)}{u(b^i)\delta^t ln(\beta\delta)ln(\delta)(1-\beta^{t^*})}>0 \tag{2}$$

$$\frac{\partial t^*}{\partial b^i}=\frac{f(c_0^i)u'(b^i)(1-\beta\delta)ln(\beta)}{u(b^i)^2\delta^t ln(\beta\delta)ln(\delta)(1-\beta^{t^*})}<0 \tag{3}$$

Comparative Statics

Recall, $f'(c_0)>0$, $0<\delta,\beta<1$, $b>0$, $t\geq 1$.

In this section, we drop the $*$ superscript on t, as well as the i superscripts on b and c. In order to obtain comparative statics for the parameters of the model we use implicit differentiation. First, we are interested in the effect of an increase in costs on t^*. This comparative static is obtained through implicit differentiation of equation 1. To simplify notation, I will drop the superscript on t. Thus, I'm interested in $\frac{\partial t}{\partial c_0}$.

$$D\left[ln(\beta)\left[1-(\beta\delta)^{t^*}\right]-\delta^{t^*}ln(\beta\delta)\left[1-\beta^{t^*}\right]-\frac{f(c_0)(1-\beta\delta)ln(\beta)}{u(b)}\right]=D\left[0\right]$$

$$D\left[-ln\beta(\beta\delta)^t\right]-D\left[\delta^t ln(\beta\delta)\right]+D\left[(\beta\delta)^t ln(\beta\delta)\right]-D\left[\frac{f(c_0)(1-\beta\delta)ln(\beta)}{b}\right]=0$$

$$\partial t\delta^t ln(\beta\delta)\left[-\beta^t ln(\beta)-ln(\delta)+\beta^t ln(\beta\delta)\right]=\frac{f'(c_0)(1-\beta\delta)ln(\beta)}{u(b)}\partial c_0$$

$$\frac{\partial t}{\partial c_0}=-\frac{f'(c_0)(1-\beta\delta)ln(\beta)}{u(b)\delta^t ln(\beta\delta)ln(\delta)(1-\beta^t)}>0 \tag{4}$$

It is then straightforward to find an expression for $\frac{\partial t}{\partial b}$

$$\frac{\partial t}{\partial b} = \frac{f(c_0)u'(b)(1-\beta\delta)ln(\beta)}{(u(b))^2 \delta^t ln(\beta\delta)ln(\delta)(1-\beta^t)} < 0 \tag{5}$$

Expressions for $\frac{\partial t}{d\beta}$ and $\frac{\partial t}{\partial \delta}$ can also be obtained via implicit differentiation. $\frac{\partial t}{\partial \delta}$ can be obtained as follows from equation 1:

$$\begin{aligned} & t' \left[-(\beta\delta)^t \delta ln(\beta\delta) - \delta\delta^t ln(\beta\delta)ln(\delta) + \delta(\beta\delta)^t ln(\beta\delta)ln(\beta\delta) \right] \\ & = -\frac{f(c_0)\beta\delta ln(\beta)}{u(b)} + t\left[(\beta\delta)^t + \delta^t ln(\beta\delta) - (\beta\delta)^t ln(\beta\delta) \right] + \delta^t(1-\beta^t) \end{aligned}$$

Rearranging and simplifying the righthand side of the equation yields:

$$\begin{aligned} & t'\delta\delta^t ln(\beta\delta)\left[\beta^t(ln(\beta)-1) - ln(\delta)(1-\beta^t) \right] \\ & = -\frac{f(c_0)\beta\delta ln(\beta)}{u(b)} + t\left[(\beta\delta)^t + \delta^t ln(\beta\delta) - (\beta\delta)^t ln(\beta\delta) \right] + \delta^t(1-\beta^t) \end{aligned}$$

Finally, solving for $t' = \frac{\partial t}{\partial \delta}$

$$\frac{\partial t}{\partial \delta} = \frac{1}{\delta\delta^t ln(\beta\delta)\left[\beta^t(ln\beta - 1) - ln\delta(1-\beta^t)\right]} \left[-\frac{f(c_0)\beta\delta ln\beta}{u(b)} + t\left[(\beta\delta)^t + \delta^t ln(\beta\delta) - (\beta\delta)^t ln(\beta\delta) \right] + \delta^t(1-\beta^t) \right] \tag{6}$$

$\frac{\partial t}{\partial \delta} > 0$ when two conditions are met:

1. $\beta^t(ln(\beta)-1) - ln(\delta)(1-\beta^t) > 0 \rightarrow \frac{\beta^t}{1-\beta^t} < \frac{-ln(\delta)}{1-ln(\beta)}$
2. $t\left[(\beta\delta)^t + \delta^t ln(\beta\delta) - (\beta\delta)^t ln(\beta\delta) \right] > 0 \rightarrow \frac{\beta^t}{1-\beta^t} < -ln(\beta\delta)$

When these two conditions hold, $\frac{\partial t}{\partial \delta} > 0$. This relationship between t^* and δ is intuitive: the more quickly the benefits (e.g., the warm glow) from donating wear off, then the more quickly a donor will return to donate in order to reset his benefits.

Again, use implicit differentiation to obtain $\frac{\partial t}{\partial \beta}$ from equation 1

$$\begin{aligned} & t' \left[-\beta(\beta\delta)^t ln(\beta\delta)ln\beta - \beta\delta^t ln\delta ln(\beta\delta) + \beta(\beta\delta)^t ln(\beta\delta)ln(\beta\delta) \right] \\ & = \frac{f(c_0^i)\left[1-\beta\delta-\beta\delta ln\beta\right]}{u(b)} - (1-\delta^t) - t(\beta\delta)^t ln\delta \end{aligned}$$

Simplifying the left-hand side of the equation yields:

$$t'\beta\delta^t ln(\beta\delta)\left[(\beta^t - 1)ln\delta \right] = \frac{f(c_0^i)\left[1-\beta\delta-\beta\delta ln\beta\right]}{u(b)} - (1-\delta^t) - t(\beta\delta)^t ln\delta$$

Solving for $t' = \frac{\partial t}{\partial \beta}$ yields:

$$\frac{\partial t}{\partial \beta} = \frac{-1}{\beta\delta^t ln(\beta\delta)\left[(1-\beta^t)ln\delta\right]}\left[\frac{f(c_0^i)\left[1-\beta\delta-\beta\delta ln\beta\right]}{u(b)} - (1-\delta^t) - t(\beta\delta)^t ln\delta\right] \tag{7}$$

$\frac{\partial t}{\partial \beta} > 0$ when $\frac{f(c_0^i)[1-\beta\delta-\beta\delta ln\beta]}{u(b)} - (1-\delta^t) - t(\beta\delta)^t ln\delta < 0$ and $\frac{\partial t}{\partial \beta} < 0$ if $\frac{f(c_0^i)[1-\beta\delta-\beta\delta ln\beta]}{u(b)} - (1-\delta^t) - t(\beta\delta)^t ln\delta > 0$.

The benefits of donating are discounted by beta in every period, whereas the costs are discounted only once every t^* periods. An increasing relationship between t^* and β occurs when, as β increases, the increase in the present value of a donor's stream of benefits increases more than the discounted present value of future costs.

Supplementary Material C

Survey