Demand Tables

These tables provide estimates of underlying demand for uniform categories of library materials using annual circulation totals and item counts. The estimates can be used to estimate reader availability and in budget models based on supply/demand equality. They are also valuable for close comparison of alternate rhizomes.

Librarians have traditionally used circulation as a measure of reader demand, but circulation alone does not provide an accurate estimate of underlying demand, particularly for busy collections. The tables in this booklet are based on queuing theory models that enable us to derive a better estimate of demand.

Although the math is not complicated, the method moves beyond the assumptions that we typically make about the reliability of circulation as a surrogate for demand. Instead of being content with a measure of the recorded use of a collection, the tables enable us to estimate the total potential use if all readers were to be satisfied.

1. Circulation does not fully measure underlying demand Most collection budget and planning models are based at least partially on the concept that the supply of library materials should roughly correspond with the demand for those materials by readers: "supply/demand equality." Traditionally librarians have used circulation totals for particular collections as a measure of the demand for those collections. In a rough sense, that measure is useful, but it fails to account for unmet demand: that is, those readers who don't find materials they are interested in and go away unsatisfied. That element of demand is not reflected in circulation alone, which records only satisfied demand.

For a library with similar patterns of demand among its sub-collections, this is not a major issue. But when some sub-collections are more busy than others, the disparity between recorded circulation and underlying demand is a major factor. In public libraries, this disparity is most obvious in the relationship between adult nonfiction collections (typically low demand) and genre fiction, audiovisual and children's collections (typically high demand).

The disparity is exacerbated through the phenomenon of "circulation interference." In any sub-collection, only a few titles account for a high proportion of use. Once these popular titles reach a certain level of use, demand will continue to increase without a corresponding rise in circulation, and the relative relationship between demand and circulations becomes increasingly less direct.

2. Turnover is a measure of relative demand As demand for the titles in a collection increases, so does the turnover (average annual circulation per item). So turnover is also a rough measure of relative demand—sub-collections with a high turnover have more demand. But turnover alone is not a full measure of unmet demand, because it still uses raw circulation for the sub-collection in the calculation. Although turnover typically reflects demand more effectively than circulation for sub-collections in high demand, translating that rate into the full underlying demand cannot be done directly.

One corollary of turnover as a measure is that a typical item in a high-turnover collection is working harder than a typical item in a low-turnover collection. An investment in a high-

turnover sub-collection has higher returns in satisfied readers than the same investment in a low-turnover sub-collection, because on the average more readers will be satisfied by any single new item in the high-turnover sub-collection. This is an important reason for using demand estimates based on turnover rather than raw circulation when setting budget allocations based on supply/demand equality.

3. Queuing theory enables us to estimate unmet demand from turnover Queuing theory employs mean use data, the equivalent of turnover, to inform practical decisions such as how many teller stations a bank should provide or how many phone operators a customer service center needs. Philip Morse, one of the founders of queuing theory, pointed out that standard queuing models can also be used to estimate the underlying demand for sub-collections of library materials.

It is the Morse approach that is used in the demand model. The model defines demand as the annual potential uses of a collection, whether prompted by active search or browsing, thus taking into account casual readers who do not enter the library with the intent of finding a specific item. The demand tables enable us to predict the average number of readers who will be interested in the average item in a collection, and extrapolate from that to the number of potential annual uses for the collection a whole.

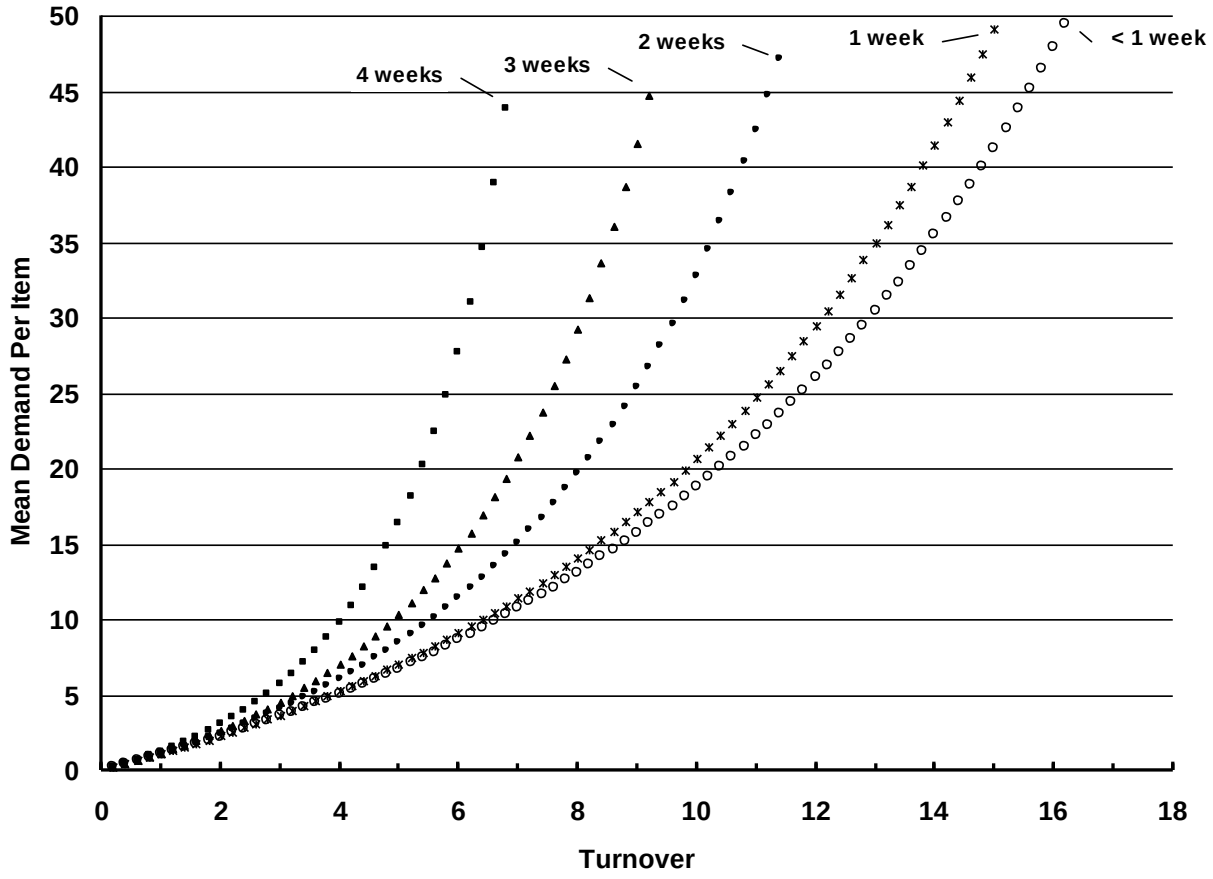
According to the equations Morse sets out, the increase in demand related to turnover is exponential. That is, as turnover increases, demand increases even more. The rate of increase can be plotted using a standard distribution known as the exponential integral. The loan period of the collection is a crucial factor in the relationship. Longer loan periods create greater circulation interference, and so affect the calculation of underlying demand. The graph on page 3 shows how demand per item changes as turnover increases for five standard loan periods. As turnover increases, the number of potential uses for a collection increases at a higher rate. That is why the trend lines in the chart curve upward (exponential), rather than being straight (linear).

4. The collection in place affects turnover One problem with the demand model is that it assumes that sub-collections are well-weeded, or at least weeded at the same rate. The presence of a large number of out-dated, worn, or seldom used items in a collection will be an artificial drag on turnover. Another problem is that the selection of materials in a collection may not be representative of those that readers are seeking. Therefore use will be lower than it might be in a library with a more reader-oriented collection. However, these problems also exist when recorded circulation is used as a measure of demand. The tables will give a clearer picture of underlying demand, but weeding and selection are still important.

When weeding and selection practices become more effective, the measures will tend to stabilize at equilibrium levels among sub-collections. As holdings are increased in sub-collections with high turnover, their turnover will move lower. As holdings are decreased or made more relevant in sub-collections with low turnover, their turnover will move higher. In all collections, turnover will better reflect underlying demand. Distortions in collection size and use based on past over- and under- selection will gradually exert less influence on turnover, so that the measured demand will come closer to the actual demand.

See: Philip M Morse, "Demand for Library Materials: An Exercise in Probability Analysis," *Collection Management* 1, no. 3-4 (Fall-Winter 1976): 47-78.

Mean Demand per Item by Turnover for Standard Library Loan Periods



Both mean demand per item and turnover can extend further than is illustrated in this chart, and often do for collections with loan periods shorter than 4 weeks. The tables on pages 8-12 of this booklet extend to the likely limits of turnover for each loan period.

Spreadsheet format available

The demand tables are easily integrated into spreadsheet applications. Excel workbooks with the full tables are available upon request from Roy Kenagy: rjkenagy@netins.net.

How to Use the Demand Tables

1. Determine the collection category that will be measured. The category should be relatively homogenous (picture books, adult biographies, entertainment videos, true crime, etc.) and ideally include at least 400 items.

2. Determine the average annual number of items in the category. If the number of items is stable, simply use the mean of the holdings at the beginning and end of the year. Otherwise, determine the mean of the monthly holdings.

3. Determine the circulation of the category for the year. Ideally, use the number of original circulations: the number of circulations without renewals. If renewals can't be separated, the demand estimates will be high. They will be most useful for comparing collections with the same likely rate of renewal, rather than as a measure of absolute demand.

4. Determine the turnover for the category. Divide the annual circulation of the category (3 above) by the average annual number of items (2 above).

5. Select the table to use. The five tables correspond to standard library loan periods: partial week (2-4 days), 1 week, 2 weeks, 3 weeks, and 4 weeks. Use the table that corresponds to the loan period for the category being measured.

6. Find the turnover for the collection being measured in the table corresponding to the standard loan period. For the partial week and 1 week tables, you will need to round the turnover to the nearest even tenth before accessing the table.

7. The figure in the column to the right of the turnover is the average demand per item. It represents the average number of readers per item who would have checked out items in the collection if all items had been available when readers were examining the collection.

8. Multiply the average demand per item (7 above) times the average annual number of items in the category (2 above). This is the demand for the entire collection: the annual number of potential uses for the collection. Round the results to the nearest ten.

Caveats

The tables assume that the average actual length of loan in a category approximates the standard loan period. Morse provides a means of calculating more exact loan lengths from a snapshot of the number of items checked out. I have developed spreadsheets with complete sets of the tables if you are interested in estimates based on the precise loan lengths for your collection. Contact me at rjkenagy@netins.net for more information.

Collections with seasonal variations in circulation may need to be analyzed by season. Divide the data into segments corresponding to the variations (summer library program months compared to all others, for instance). Annualize each segment, perform the calculations, and check for significant differences. Use a similar approach if there is a large change in holdings over the year (15% or more). Collect the data by quarters and then annualize each quarter's data to uncover any significant variations.

Theoretically, demand should always be higher than recorded circulation. When applying the tables to collections with low turnover (>1.0), rounding may yield a demand estimate higher than recorded circulation. Use recorded circulation as the demand estimate if this occurs.

Exercise: Grimes Public Library — 2003-04 data

1. Collection	2. Number of Items	3. Original Circulation	4. Turnover *(3) ÷ (2)*	5-6. Loan Period	7. Demand per item *Table*	8. Total Demand *(2) x (7)*
Picture Books	3,843	16,199		3 weeks		
Board Books	407	2,536		3 weeks		
Videos	1,127	10,949		1 week		
DVDs	805	13,015		1 week		
Audiobooks - tapes	1,005	2,327		3 weeks		
Audiobooks - CDs	438	971		3 weeks		

Exercise

1. Collection	2. Number of Items	3. Original Circulation	4. Turnover *(3) ÷ (2)*	5-6. Loan Period *Table*	7. Demand per item *Table*	8. Total Demand *(2) x (7)*

Copy this form for use with your own collections.

1. Collection	2. Number of Items	3. Original Circulation	4. Turnover *(3) ÷ (2)*	5-6. Loan Period *Table*	7. Demand per item *Table*	8. Total Demand *(2) x (7)*

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1. Collection	2. Number of Items	3. Original Circulation	4. Turnover *(3) ÷ (2)*	5-6. Loan Period *Table*	7. Demand per item *Table*	8. Total Demand *(2) x (7)*

Partial-week loan period *Use for standard loan periods of 2-4 days.*

Turnover	Demand	Turnover	Demand	Turnover	Demand	Turnover	Demand
0.2	0.2	**8.2**	13.6	**16.2**	49.4	**24.2**	182
0.4	0.4	**8.4**	14.1	**16.4**	50.9	**24.4**	189
0.6	0.6	**8.6**	14.7	**16.6**	52.5	**24.6**	196
0.8	0.8	**8.8**	15.2	**16.8**	54.1	**24.8**	204
1.0	1.1	**9.0**	15.7	**17.0**	55.7	**25.0**	212
1.2	1.3	**9.2**	16.3	**17.2**	57.5	**25.2**	221
1.4	1.5	**9.4**	16.9	**17.4**	59.2	**25.4**	230
1.6	1.8	**9.6**	17.5	**17.6**	61.0	**25.6**	240
1.8	2.0	**9.8**	18.1	**17.8**	62.9	**25.8**	250
2.0	2.3	**10.0**	18.8	**18.0**	64.9	**26.0**	262
2.2	2.5	**10.2**	19.4	**18.2**	66.9	**26.2**	273
2.4	2.8	**10.4**	20.1	**18.4**	68.9	**26.4**	285
2.6	3.0	**10.6**	20.7	**18.6**	71.1	**26.6**	299
2.8	3.3	**10.8**	21.4	**18.8**	73.3	**26.8**	313
3.0	3.6	**11.0**	22.2	**19.0**	75.6	**27.0**	328
3.2	3.9	**11.2**	22.9	**19.2**	78.0	**27.2**	344
3.4	4.2	**11.4**	23.7	**19.4**	80.5	**27.4**	361
3.6	4.5	**11.6**	24.4	**19.6**	83.0	**27.6**	380
3.8	4.8	**11.8**	25.2	**19.8**	85.7	**27.8**	400
4.0	5.1	**12.0**	26.0	**20.0**	88.5	**28.0**	422
4.2	5.4	**12.2**	26.9	**20.2**	91.3	**28.2**	446
4.4	5.7	**12.4**	27.7	**20.4**	94.2	**28.4**	470
4.6	6.1	**12.6**	28.6	**20.6**	97.4	**28.6**	499
4.8	6.4	**12.8**	29.5	**20.8**	100	**28.8**	529
5.0	6.7	**13.0**	30.4	**21.0**	104	**29.0**	562
5.2	7.1	**13.2**	31.4	**21.2**	107	**29.2**	599
5.4	7.5	**13.4**	32.4	**21.4**	111	**29.4**	638
5.6	7.9	**13.6**	33.4	**21.6**	115	**29.6**	683
5.8	8.2	**13.8**	34.4	**21.8**	119	**29.8**	731
6.0	8.6	**14.0**	35.5	**22.0**	123	**30.0**	785
6.2	9.0	**14.2**	36.6	**22.2**	127	**30.2**	848
6.4	9.4	**14.4**	37.7	**22.4**	131	**30.4**	919
6.6	9.9	**14.6**	38.8	**22.6**	136	**30.6**	997
6.8	10.3	**14.8**	40.0	**22.8**	141	**30.8**	1090
7.0	10.7	**15.0**	41.3	**23.0**	146	**31.0**	1193
7.2	11.2	**15.2**	42.5	**23.2**	151	**31.2**	1313
7.4	11.6	**15.4**	43.8	**23.4**	157	**31.4**	1460
7.6	12.1	**15.6**	45.1	**23.6**	163	**31.6**	1627
7.8	12.6	**15.8**	46.5	**23.8**	169	**31.8**	1838
8.0	13.1	**16.0**	47.9	**24.0**	175	**32.0**	2087

1-week loan period

Turnover	Demand	Turnover	Demand	Turnover	Demand	Turnover	Demand
0.2	0.2	**7.2**	11.9	**14.2**	42.9	**21.2**	155
0.4	0.4	**7.4**	12.4	**14.4**	44.4	**21.4**	162
0.6	0.6	**7.6**	13.0	**14.6**	45.9	**21.6**	169
0.8	0.8	**7.8**	13.5	**14.8**	47.5	**21.8**	177
1.0	1.1	**8.0**	14.1	**15.0**	49.2	**22.0**	185
1.2	1.3	**8.2**	14.6	**15.2**	50.9	**22.2**	193
1.4	1.5	**8.4**	15.2	**15.4**	52.7	**22.4**	203
1.6	1.8	**8.6**	15.8	**15.6**	54.5	**22.6**	212
1.8	2.0	**8.8**	16.5	**15.8**	56.4	**22.8**	223
2.0	2.3	**9.0**	17.1	**16.0**	58.4	**23.0**	234
2.2	2.5	**9.2**	17.8	**16.2**	60.5	**23.2**	246
2.4	2.8	**9.4**	18.5	**16.4**	62.6	**23.4**	259
2.6	3.1	**9.6**	19.2	**16.6**	64.8	**23.6**	273
2.8	3.4	**9.8**	19.9	**16.8**	67.1	**23.8**	287
3.0	3.7	**10.0**	20.6	**17.0**	69.5	**24.0**	304
3.2	4.0	**10.2**	21.4	**17.2**	72.0	**24.2**	321
3.4	4.3	**10.4**	22.2	**17.4**	74.7	**24.4**	340
3.6	4.6	**10.6**	23.0	**17.6**	77.3	**24.6**	361
3.8	4.9	**10.8**	23.8	**17.8**	80.2	**24.8**	383
4.0	5.2	**11.0**	24.7	**18.0**	83.2	**25.0**	408
4.2	5.6	**11.2**	25.6	**18.2**	86.2	**25.2**	435
4.4	5.9	**11.4**	26.5	**18.4**	89.5	**25.4**	464
4.6	6.3	**11.6**	27.5	**18.6**	92.9	**25.6**	498
4.8	6.7	**11.8**	28.4	**18.8**	96.3	**25.8**	535
5.0	7.0	**12.0**	29.4	**19.0**	100	**26.0**	576
5.2	7.4	**12.2**	30.5	**19.2**	104	**26.2**	622
5.4	7.8	**12.4**	31.5	**19.4**	108	**26.4**	674
5.6	8.2	**12.6**	32.6	**19.6**	112	**26.6**	734
5.8	8.6	**12.8**	33.8	**19.8**	117	**26.8**	802
6.0	9.1	**13.0**	35.0	**20.0**	121	**27.0**	880
6.2	9.5	**13.2**	36.2	**20.2**	126		
6.4	10.0	**13.4**	37.4	**20.4**	131		
6.6	10.4	**13.6**	38.7	**20.6**	137		
6.8	10.9	**13.8**	40.1	**20.8**	143		
7.0	11.4	**14.0**	41.5	**21.0**	149		

2-week loan period

Turnover	Demand	Turnover	Demand	Turnover	Demand	Turnover	Demand
0.1	0.1	**4.9**	8.2	**9.7**	30.4	**14.5**	117
0.2	0.2	**5.0**	8.5	**9.8**	31.1	**14.6**	121
0.3	0.3	**5.1**	8.7	**9.9**	32.0	**14.7**	125
0.4	0.4	**5.2**	9.0	**10.0**	32.8	**14.8**	129
0.5	0.5	**5.3**	9.3	**10.1**	33.6	**14.9**	134
0.6	0.6	**5.4**	9.6	**10.2**	34.5	**15.0**	138
0.7	0.7	**5.5**	9.9	**10.3**	35.4	**15.1**	143
0.8	0.9	**5.6**	10.2	**10.4**	36.3	**15.2**	149
0.9	1.0	**5.7**	10.5	**10.5**	37.3	**15.3**	154
1.0	1.1	**5.8**	10.8	**10.6**	38.2	**15.4**	160
1.1	1.2	**5.9**	11.1	**10.7**	39.3	**15.5**	166
1.2	1.4	**6.0**	11.4	**10.8**	40.3	**15.6**	172
1.3	1.5	**6.1**	11.7	**10.9**	41.4	**15.7**	179
1.4	1.6	**6.2**	12.1	**11.0**	42.5	**15.8**	187
1.5	1.7	**6.3**	12.4	**11.1**	43.6	**15.9**	194
1.6	1.9	**6.4**	12.8	**11.2**	44.7	**16.0**	203
1.7	2.0	**6.5**	13.1	**11.3**	45.9	**16.1**	211
1.8	2.2	**6.6**	13.5	**11.4**	47.2	**16.2**	220
1.9	2.3	**6.7**	13.9	**11.5**	48.5	**16.3**	230
2.0	2.4	**6.8**	14.3	**11.6**	49.8	**16.4**	240
2.1	2.6	**6.9**	14.7	**11.7**	51.1	**16.5**	252
2.2	2.7	**7.0**	15.1	**11.8**	52.5	**16.6**	264
2.3	2.9	**7.1**	15.5	**11.9**	53.9	**16.7**	276
2.4	3.1	**7.2**	15.9	**12.0**	55.4	**16.8**	290
2.5	3.2	**7.3**	16.3	**12.1**	56.9	**16.9**	304
2.6	3.4	**7.4**	16.8	**12.2**	58.5	**17.0**	320
2.7	3.6	**7.5**	17.2	**12.3**	60.2	**17.1**	337
2.8	3.7	**7.6**	17.7	**12.4**	61.8	**17.2**	356
2.9	3.9	**7.7**	18.2	**12.5**	63.6	**17.3**	376
3.0	4.1	**7.8**	18.7	**12.6**	65.4	**17.4**	399
3.1	4.3	**7.9**	19.1	**12.7**	67.3	**17.5**	423
3.2	4.4	**8.0**	19.6	**12.8**	69.2	**17.6**	450
3.3	4.6	**8.1**	20.1	**12.9**	71.3	**17.7**	479
3.4	4.8	**8.2**	20.7	**13.0**	73.4	**17.8**	510
3.5	5.0	**8.3**	21.2	**13.1**	75.6	**17.9**	547
3.6	5.2	**8.4**	21.8	**13.2**	77.8	**18.0**	587
3.7	5.4	**8.5**	22.3	**13.3**	80.1	**18.1**	631
3.8	5.6	**8.6**	22.9	**13.4**	82.6	**18.2**	683
3.9	5.8	**8.7**	23.5	**13.5**	85.0	**18.3**	741
4.0	6.0	**8.8**	24.1	**13.6**	87.6	**18.4**	807
4.1	6.3	**8.9**	24.7	**13.7**	90.3	**18.5**	882
4.2	6.5	**9.0**	25.4	**13.8**	93.1	**18.6**	967
4.3	6.7	**9.1**	26.0	**13.9**	96.1	**18.7**	1070
4.4	7.0	**9.2**	26.7	**14.0**	99.3	**18.8**	1200
4.5	7.2	**9.3**	27.4	**14.1**	102	**18.9**	1350
4.6	7.4	**9.4**	28.1	**14.2**	106	**19.0**	1530
4.7	7.7	**9.5**	28.8	**14.3**	109	**19.1**	1760
4.8	7.9	**9.6**	29.6	**14.4**	113	**19.2**	2070

3-week loan period

Turnover	Demand	Turnover	Demand	Turnover	Demand	Turnover	Demand
0.1	0.1	**4.1**	7.3	**8.1**	30.3	**12.1**	160
0.2	0.2	**4.2**	7.6	**8.2**	31.3	**12.2**	170
0.3	0.3	**4.3**	7.9	**8.3**	32.4	**12.3**	180
0.4	0.4	**4.4**	8.2	**8.4**	33.6	**12.4**	192
0.5	0.5	**4.5**	8.6	**8.5**	34.8	**12.5**	204
0.6	0.6	**4.6**	8.9	**8.6**	36.0	**12.6**	217
0.7	0.8	**4.7**	9.2	**8.7**	37.3	**12.7**	232
0.8	0.9	**4.8**	9.6	**8.8**	38.7	**12.8**	249
0.9	1.0	**4.9**	9.9	**8.9**	40.1	**12.9**	267
1.0	1.1	**5.0**	10.3	**9.0**	41.6	**13.0**	288
1.1	1.3	**5.1**	10.7	**9.1**	43.1	**13.1**	311
1.2	1.4	**5.2**	11.1	**9.2**	44.7	**13.2**	337
1.3	1.6	**5.3**	11.5	**9.3**	46.4	**13.3**	367
1.4	1.7	**5.4**	11.9	**9.4**	48.2	**13.4**	401
1.5	1.8	**5.5**	12.3	**9.5**	50.0	**13.5**	440
1.6	2.0	**5.6**	12.8	**9.6**	51.9	**13.6**	486
1.7	2.1	**5.7**	13.3	**9.7**	53.9	**13.7**	540
1.8	2.3	**5.8**	13.7	**9.8**	56.1	**13.8**	606
1.9	2.5	**5.9**	14.2	**9.9**	58.3	**13.9**	683
2.0	2.6	**6.0**	14.7	**10.0**	60.7	**14.0**	779
2.1	2.8	**6.1**	15.2	**10.1**	63.1	**14.1**	900
2.2	3.0	**6.2**	15.8	**10.2**	65.7	**14.2**	1050
2.3	3.1	**6.3**	16.3	**10.3**	68.5	**14.3**	1250
2.4	3.3	**6.4**	16.9	**10.4**	71.3	**14.4**	1540
2.5	3.5	**6.5**	17.5	**10.5**	74.5	**14.5**	1960
2.6	3.7	**6.6**	18.1	**10.6**	77.6	**14.6**	2610
2.7	3.9	**6.7**	18.7	**10.7**	80.9	**14.7**	3710
2.8	4.1	**6.8**	19.4	**10.8**	84.6	**14.8**	6210
2.9	4.3	**6.9**	20.0	**10.9**	88.5		
3.0	4.5	**7.0**	20.7	**11.0**	92.5		
3.1	4.8	**7.1**	21.5	**11.1**	96.8		
3.2	5.0	**7.2**	22.2	**11.2**	101		
3.3	5.2	**7.3**	23.0	**11.3**	106		
3.4	5.5	**7.4**	23.8	**11.4**	111		
3.5	5.7	**7.5**	24.6	**11.5**	117		
3.6	5.9	**7.6**	25.5	**11.6**	123		
3.7	6.2	**7.7**	26.3	**11.7**	129		
3.8	6.5	**7.8**	27.2	**11.8**	136		
3.9	6.8	**7.9**	28.2	**11.9**	144		
4.0	7.0	**8.0**	29.2	**12.0**	152		

4-week loan period

Turnover	Demand	Turnover	Demand	Turnover	Demand	Turnover	Demand
0.1	0.1	**2.6**	4.5	**5.1**	17.3	**7.6**	74.3
0.2	0.2	**2.7**	4.8	**5.2**	18.2	**7.7**	79.9
0.3	0.3	**2.8**	5.1	**5.3**	19.1	**7.8**	86.3
0.4	0.4	**2.9**	5.4	**5.4**	20.2	**7.9**	93.3
0.5	0.5	**3.0**	5.7	**5.5**	21.2	**8.0**	102
0.6	0.7	**3.1**	6.0	**5.6**	22.4	**8.1**	110
0.7	0.8	**3.2**	6.4	**5.7**	23.6	**8.2**	120
0.8	0.9	**3.3**	6.8	**5.8**	24.9	**8.3**	132
0.9	1.1	**3.4**	7.1	**5.9**	26.3	**8.4**	145
1.0	1.2	**3.5**	7.5	**6.0**	27.7	**8.5**	160
1.1	1.4	**3.6**	7.9	**6.1**	29.3	**8.6**	178
1.2	1.5	**3.7**	8.4	**6.2**	31.0	**8.7**	199
1.3	1.7	**3.8**	8.8	**6.3**	32.7	**8.8**	225
1.4	1.9	**3.9**	9.3	**6.4**	34.6	**8.9**	256
1.5	2.0	**4.0**	9.8	**6.5**	36.7	**9.0**	294
1.6	2.2	**4.1**	10.3	**6.6**	38.9	**9.1**	341
1.7	2.4	**4.2**	10.9	**6.7**	41.2	**9.2**	403
1.8	2.6	**4.3**	11.5	**6.8**	43.8	**9.3**	485
1.9	2.8	**4.4**	12.1	**6.9**	46.6	**9.4**	598
2.0	3.0	**4.5**	12.7	**7.0**	49.7	**9.5**	768
2.1	3.2	**4.6**	13.4	**7.1**	52.8	**9.6**	1040
2.2	3.5	**4.7**	14.1	**7.2**	56.4	**9.7**	1520
2.3	3.7	**4.8**	14.8	**7.3**	60.3	**9.8**	2510
2.4	4.0	**4.9**	15.6	**7.4**	64.5		
2.5	4.2	**5.0**	16.4	**7.5**	69.2		