Discrete-Choice Wizards

Microsoft Excel add-ins that facilitate discrete-choice projects

Discrete-Choice Models

In recent years, discrete-choice analysis has emerged as a powerful tool in the market-research arsenal. Based on consumers' hypothetical or real-world choices, discrete-choice models help guide product managers' critical tasks:

- Positioning products in a competitive marketplace
- Developing strategic and tactical pricing strategies
- Sizing markets for new products
- Determining the optimal mix of product features
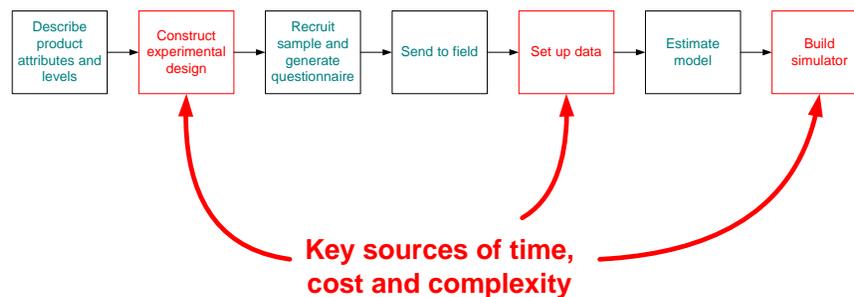- Isolating market segments based on product preferences

However, key factors limit adoption

- Complexity of available techniques, e.g.,
  - Nested specifications
  - Allowance for heterogeneity (mixed logit)
  - Latent-class choice
- Expense of typical projects - $100,000 +
- Need for specialists
- Time required to design and execute projects
  - Often 6-12 weeks
  - Longer if many constituents are involved

A Typical DCM Project Schedule

Describe product attributes and levels	Construct experimental design	Recruit sample and generate questionnaire	Send to field	Set up data	Estimate model	Build simulator

Key sources of time, cost and complexity

If you're a market-research manager or practitioner,

Would you like to:

- Make generating experimental designs EASY
- Make data setup EASY
- Make building a simulator EASY

while improving quality?

| Describe product attributes and levels | → | **Design Wizard** | → | Recruit sample and generate questionnaire | → | Send to field | → | **Data Wizard** | → | Estimate model | → | **Simulator Wizard** |

To be more precise,

Would you like to:

- Produce an experimental design in minutes rather than hours?
- Eliminate the tedium in reformatting data to suit requirements of computer programs?
- Cut days out of the time it takes to implement a discrete-choice project?
- Automatically deliver an Excel-based simulator to your end-users?

If so, take a look at StatWizards®

- Design Wizard - An Excel add-in that takes a list of product attributes and generates an experimental design
- Data Wizard – A second add-in that takes a spreadsheet of respondent data and configures it for the most popular discrete-choice estimation packages
- Simulator Wizard - A third add-in that reads the output from a statistical package and builds a market simulator in Excel

Design Wizard

| Describe product attributes and levels | Design Wizard | Recruit sample and generate questionnaire | Send to field | Set up data | Estimate model | Build simulator |

An Excel add-in that generates an experimental design and choice sets based on a list of product attributes

Design Wizard Features

- Automatic selection of best design
- Designs are fully customizable
- Permits blocked and unblocked designs
- Supports up to 13 attribute levels
- Suggests values for choices per store
- Recommends blocking factor, if needed
- Uses Solver to maximize efficiency and minimize overlap
- Permits extremely complex designs
- Translates choice exercises into other languages
- Employs best-practice defaults at every step

Design Wizard Benefits

- Greatly reduced time in design construction
- High-quality, optimal designs
- Elimination of error
- Flexibility to meet most needs
- Facilitation of very complex designs
- Ease of learning and use
- Typically pays for itself in one project

Design Wizard Requirements

- A list of product attributes, e.g.,
  - Brand
  - Price
  - Key features
- A list of levels or level ranges for each attribute, e.g.,
  - $100 - $500
  - Bundled vs. unbundled
  - Sony, Motorola, Ericsson

Design Wizard Walkthrough - 1

1. Start with a simple list of product attributes and levels in Excel.

Attribute name:	Model	Brand	Meter shelf price	Mfr. Rebate	Trade-in allowance	Glucose test strip quantity	Glucose test speed	Glucose test strip unit price
	CheckIt Instant	X	$16.88	$0.00	$0.00	25	5 sec	$0.50
	CheckIt Simple	X	$109.99	$40.00	$40.00	100	15 sec	$0.85
	King	None					30 sec	
Test values:	2In1	Ours					40 sec	
	ExactlyRight	Y						
	OneDrop	Z						
	TakeControl	Ours						
	LightTouch	Big						

Experimental Design Wizard Step 1 of 7

Welcome to the Experimental Design Wizard. Using a spreadsheet with attributes you want to test, this wizard creates an experimental design you can use to estimate discrete-choice models.

Step 1. Select the cells containing the attributes you want to test. If you disagree with the range provided, press the button to select a new range with your mouse.

$A$1:$U$9

Cancel   << Back   Next >>   Finish

2. Run the wizard from Excel's Tools menu.

Design Wizard Walkthrough - 2

3. The wizard adds some information and directions to your workbook…

Design Wizard Walkthrough - 3

4. It spreads attribute ranges and assigns unique variable names…

Design Wizard Walkthrough - 4

5. …then in seconds builds an experimental design, …

	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI
1							1	2	3	4	5	6
2				Choice set	Question	Alt	Model	Brand	Meter shelf price	Mfr. Rebate	Trade-in allowance	Glucose test strip quantity
3									X4X5	X6X7	X8X9	X10X11
4	X28X29	X30X31	X32X33		Question	AltNo			MtrPrice	MfrRbt	TrdAllwn	GlcQnty
5	0	0	0	1	1	1	CheckIt Instant	X	$16.88	$0.00	$0.00	25
6	3	2	0		1	2	CheckIt Simple	X	$47.92	$40.00	$0.00	75
7	2	3	2		1	3	King	None	$47.92	$13.33	$13.33	75
8	3	0	2		1	4	2In1	Ours	$78.96	$0.00	$40.00	100
9	2	3	2		1	5	ExactlyRight	Y	$109.99	$13.33	$40.00	25
10	3	3	1		1	6	OneDrop	Z	$16.88	$0.00	$26.66	75
11	1	0	2		1	7	TakeControl	Ours	$47.92	$40.00	$40.00	50
12	0	0	2		1	8	LightTouch	Big	$47.92	$0.00	$26.66	100
13	2	0	1	2	2	1	CheckIt Instant	X	$16.88	$26.66	$13.33	50
14	1	3	0		2	2	CheckIt Simple	X	$78.96	$40.00	$26.66	50
15	3	2	1		2	3	King	None	$47.92	$13.33	$26.66	50
16	3	1	3		2	4	2In1	Ours	$16.88	$26.66	$26.66	100
17	0	3	3		2	5	ExactlyRight	Y	$16.88	$26.66	$0.00	50
18	0	2	0		2	6	OneDrop	Z	$109.99	$26.66	$26.66	50
19	2	3	0		2	7	TakeControl	Ours	$109.99	$26.66	$0.00	100
20	1	1	1		2	8	LightTouch	Big	$47.92	$13.33	$40.00	25
21	0	2	2	3	3	1	CheckIt Instant	X	$16.88	$26.66	$40.00	75

H ◄ ► H \ Attributes / Variables / Available designs \ Design / Layout / Export / |◄|

Design Wizard Walkthrough - 5

6. …complete with printer- or Web-ready shopping excursions, …

8

Design Wizard Walkthrough - 6

7. … and a data set ready for export to most statistical packages.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Question	AltNo	MtrPrice	MfrRbt	TrdAllwn	GlcQntty	GlcSpeed	GlcPrice	GlcAvlbl	GlpQntty	GlpPrice	Bundle	BndDscnt
2	1	1	16.88	0	0	25	5	0.5	0	2	0	0	0
3	1	2	47.92	40	0	75	5	0.62	1	4	3.33	1	0.2
4	1	3	47.92	13.33	13.33	75	15	0.5	0	8	10	1	0.2
5	1	4	78.96	0	40	100	30	0.85	0	8	3.33	1	0
6	1	5	109.99	13.33	40	25	30	0.5	0	4	3.33	0	0.1
7	1	6	16.88	0	26.66	75	40	0.5	1	8	3.33	1	0.1
8	1	7	47.92	40	40	50	40	0.5	1	8	0	1	0.1
9	1	8	47.92	0	26.66	100	30	0.5	1	12	10	0	0.2
10	1	9	0	0	0	0	0	0	0	0	0	0	0
11	2	1	16.88	26.66	13.33	50	40	0.5	0	4	10	1	0.3
12	2	2	78.96	40	26.66	50	5	0.5	0	8	6.66	1	0.3
13	2	3	47.92	13.33	26.66	50	5	0.74	0	12	6.66	0	0
14	2	4	16.88	26.66	26.66	100	5	0.74	0	4	3.33	0	0.3
15	2	5	16.88	26.66	0	50	15	0.62	1	8	3.33	0	0
16	2	6	109.99	0	26.66	50	15	0.85	0	2	3.33	1	0.3
17	2	7	109.99	26.66	0	100	40	0.74	1	12	6.66	0	0.1
18	2	8	47.92	13.33	40	25	15	0.85	1	12	3.33	0	0.3
19	2	9	0	0	0	0	0	0	0	0	0	0	0
20	3	1	16.88	26.66	40	75	5	0.85	1	12	6.66	1	0.3
21	3	2	109.99	0	13.33	100	40	0.62	0	12	0	0	0.2
22	3	3	109.99	40	26.66	100	30	0.62	1	2	0	1	0.2

Attributes / Variables / Available designs / Design / Layout

Design Wizard Limitations

- 3-level designs are not supported
  - Must be converted to 4 levels, with some loss in balance
  - Often this is not a critical limitation
- Designs above 2^{11} support main effects only
  - In practice this is a good compromise between complexity and tractability

The Design Wizard

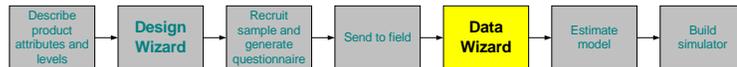Turbo-charges the generation of efficient experimental designs, making the process **EASY**

Data Wizard

Describe product attributes and levels		Design Wizard		Recruit sample and generate questionnaire		Send to field		Data Wizard		Estimate model		Build simulator

An Excel add-in that converts a spreadsheet of participant responses into data sets and control files accepted by major statistical programs

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Data Wizard Features

- Starts with a spreadsheet of responses – the simplest data form
- Automatically distinguishes between continuous, categorical, binary and choice variables.
- Handles both stated-preference (SP) and revealed-preference (RP) data
- Can incorporate design data from other spreadsheets
- Generates data sets and starting command files for most popular statistical estimation packages
  - Latent GOLD Choice
  - Limdep
  - R
  - Biogeme
  - Gauss (Kenneth Train's mixed logit programs)

Data Wizard Benefits

- Eliminates the most tedious portion of a discrete-choice project: Data setup
- Removes a common source of error:
  - The lengthy customized data manipulation routines needed to sort and merge design and response data.
- Cuts at least a day off a discrete-choice project's schedule
- Typically pays for itself in one project

Data Wizard Requirements

- A spreadsheet of response data, with respondents in rows and variables in columns
- Optional: a separate worksheet containing design elements
- A supported statistical package that can estimate discrete-choice models
  - Latent GOLD Choice
  - LIMDEP's NLOGIT
  - R's mlogit library
  - Biogeme
  - Gauss + Kenneth Train's Mixed Logit routine

Data Wizard Walkthrough - 1

1. Start with a simple spreadsheet containing survey responses.

2. Run the wizard from Excel's Tools menu.

Data Setup Wizard

Welcome to the Data Setup Wizard. Using a spreadsheet with an experimental design plus a spreadsheet with raw data, this wizard creates a dataset that serves as input to a DCM statistical estimation package.

Step 1. Select the cells containing the raw data.

Your selection must contain a header row. If you disagree with the range provided, press the button to select a new range with your mouse.

$A$7:$Y$348

Cancel   << Back   Next >>   Finish

Data Wizard Walkthrough - 2

3. The wizard adds some additional information to your workbook…

Automatically determines variable type

Automatically generates variable names

Data Wizard Walkthrough - 3

4. It recognizes discrete variables and sets up categories, ...

	A	B	C	D	E	F	G	H
1	Value	Age	InsSttn	MdcPlan	WhnDgnsd	DbtType	Income	Ethnicit
2	1		Ins01	Mdc01	Whn01	Dbt01	Inc01	Eth01
3	2	Age02	Ins02	Mdc02	Whn02	Dbt02	Inc02	
4	3	Age03		Mdc03	Whn03	Dbt03	Inc03	Eth03
5	4	Age04	Ins04	Mdc04				Eth04
6	5	Age05	Ins05					
7	6	Age06	Ins06					Eth06
8								
9								
10		The above variable names are just placeholders.						
11		You will probably want to substitute more descriptive names.						
12		For example, you might replace a name such as "Age02" with "Age25X34".						
13		When you have replaced all the above names with ones you want,						
14		rerun Tools	Data setup from Excel's menu (or press Ctrl-Shift-D).						
15								

Data / DO NOT USE \ **Variables** /

5. … then allows the user to designate category names.

(It will import any names in an SPSS file)

	A	B	C	D	E	F	G	H
1	Value	Age	InsSttn	MdcPlan	WhnDgnsd	DbtType	Income	Ethnicit
2	1	AX25	HMO	UseInsln	DiagX2	Type1	IncX35	AfricAmr
3	2	A25X34	PPO	UseDiet	Diag2x5	Type2	Inc35x60	
4	3	A35X44	TradInsr	UseMeds	Diag5X	TypeUnkn	Inc60X	Caucasn
5	4	A45X54	Medicare	UseOther				Hispanic
6	5	A55X64	OthStIns					
7	6	A65X	OthInsur					OthEthn
8								

Data / DO NOT USE \ **Variables** / Export /

Data Wizard Walkthrough - 4

6. The wizard then reformats the data for export to most statistical packages.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	ID	AX25	A25X34	A35X44	A45X54	A55X64	A65X	HMO	PPO	TradInsr	Medicare	OthStIns	OthInsur	ReimbMA	ReimbMP	ReimbSA
2	1001	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
3	1002	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1
4	1004	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1
5	1005	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1
6	1006	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1
7	1007	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1
8	1008	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1
9	1009	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0
10	1010	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1
11	1011	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1
12	1012	0	0	0	1	0	0	0	1	0	0	0	0			1
13	1012	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
14	1013	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1
15	1014	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
16	1015	0	0	0	1	0	0	0	0	0	0	1	0	1	0	1
17	1016	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
18	1017	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1
19	1018	0	0	0	0	0	1	1	0	0	1	0	0	1	0	1

Data / DO NOT USE / Variables \ **Export** /

Data Wizard Walkthrough - 5

7. Next, it asks the user to select from a number of statistical packages….
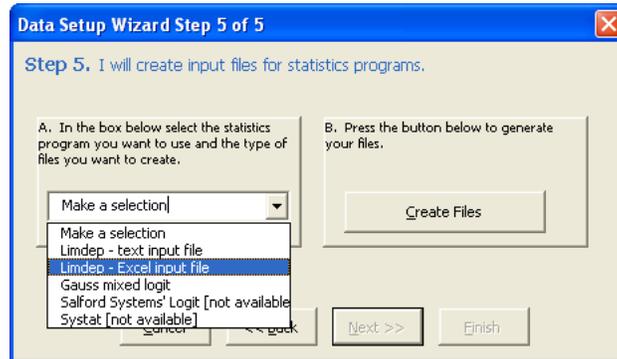
Data Wizard Walkthrough - 6

8. Finally, it combines socio-demographic with design data (e.g., from the Design Wizard) to produce a data set ready for input into the chosen statistics program…

9. …and generates a command file needed to load the data set.

Data Wizard Limitations

- Current release does not cover all estimation packages. Does not yet include:
  - SAS
  - S Plus
  - SYSTAT
  - Dan Steinberg's LOGIT program
  - Kenneth Train's Probit program in Gauss
- Support for these packages will be added on request

The Data Wizard

Makes organizing even large data sets for discrete-choice estimation **EASY**

Simulator Wizard

Describe product attributes and levels	Design Wizard	Recruit sample and generate questionnaire	Send to field	Data Wizard	Estimate model	Simulator Wizard

An Excel add-in that reads output files from statistical estimation programs (and StatWizards spreadsheets, if they exist), then builds a market simulator in Excel

Simulator Wizard Features

- Quickly translates statistical output to a powerful tool that product managers can use.
- Can be easily customized and extended. Examples:
  - Inclusion of production cost data
  - Calculation of contribution margins
- Users don't have to deal with underlying statistics
- Easily handles individual-level coefficients
- Automatically generates presentation-ready charts
  - Price curves
  - Feature importance
  - Willingness to pay

Simulator Wizard Benefits

- Translates statistical output into a form that product managers can use to make critical decisions
- Gives managers a powerful tool for pricing and positioning their product or service in a competitive marketplace
- Use of Excel allows extensive customization to suit individual requirements
- Fast construction saves time
- Typically pays for itself in one project

Simulator Wizard Requirements

- Text file containing output from a discrete-choice estimation
  - Latent GOLD Choice
  - LIMDEP
  - R's mlogit library
  - Biogeme
  - Gauss
- Optional: data spreadsheet created with the Data Setup Wizard
- Optional: design spreadsheet created with the Experimental Design Wizard

Simulator Wizard Walkthrough - 1

1. Start with output file from a program that estimates discrete-choice models.

Simulator Wizard Walkthrough - 2

2. Run the wizard from Excel's Tools menu.

Simulator Wizard Walkthrough - 3

3. The Wizard prompts for some additional information, …

Simulator Wizard Walkthrough - 4

4. … links the originating data and design sheets, …

Simulator Wizard Walkthrough - 5

5. … and builds a market simulator, …

…complete with a diffusion model …

Simulator Wizard Walkthrough - 6

…and a price curve generator.
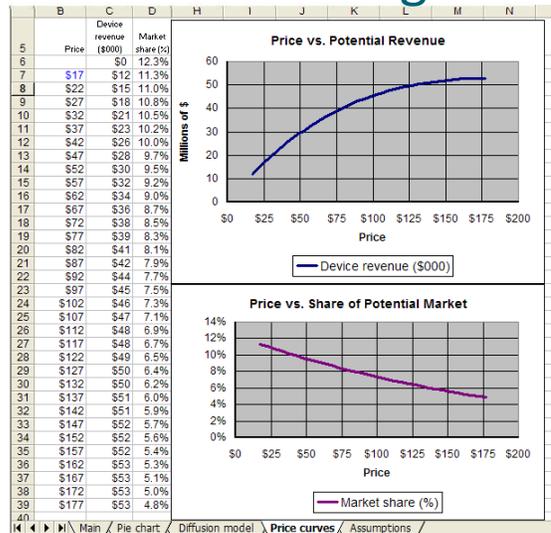
Simulator Wizard Limitations

- Does not yet handle dynamic discrete-choice models, where parameters vary over time.
  - This is a future release
- Requires calibration to be effective.
  - Revealed preference data can be used here
  - Let a market expert apply factor adjustments
  - The program includes reasonable defaults for calibration
- Some complex specifications may require manual intervention.

Suite Features

- Each wizard can stand alone, yet benefits from the other wizards
  - The Data Wizard can automatically incorporate designs produced by the Design Wizard
  - The Simulator Wizard can automatically incorporate information from both Data and Design Wizards
- Common look and feel resemble Microsoft wizards, making them easy to learn and use.
- Payback is immediate
  - Cost savings from just one project can exceed the cost of the entire suite

Summary

- StatWizards® are Excel add-ins that facilitate the execution of discrete-choice projects.
- Each wizard can either stand alone or integrate with others.
- Combined, the suite cuts days off projects, reduces costs, and improves the accuracy of the results.
- Return on investment is immediate.

Conclusion

If you do serious market research, the StatWizards® modules,

- Design Wizard
- Data Wizard
- Simulator Wizard

will improve the quality of your staff's work and make your life **EASY**

Contact Information

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