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BURGUNDY SCHOOL OF BUSINESS

Chaire Banque Populaire en microfinance

Management information systems for microfinance institutions: the U-shaped features-scale curve

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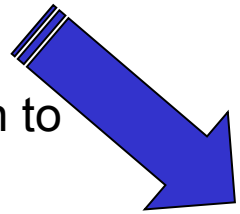
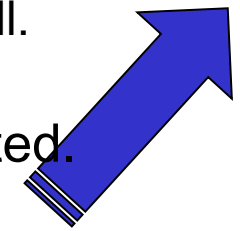
Intro

- Exists a U-shaped Functionality-Scale curve specific to management information systems for microfinance institutions;
- The left side of the curve is sloping downwards
  MFIs switch form manual MIS to semi-computerized (spreadsheets), then to low-end DB engines or self-developed software.

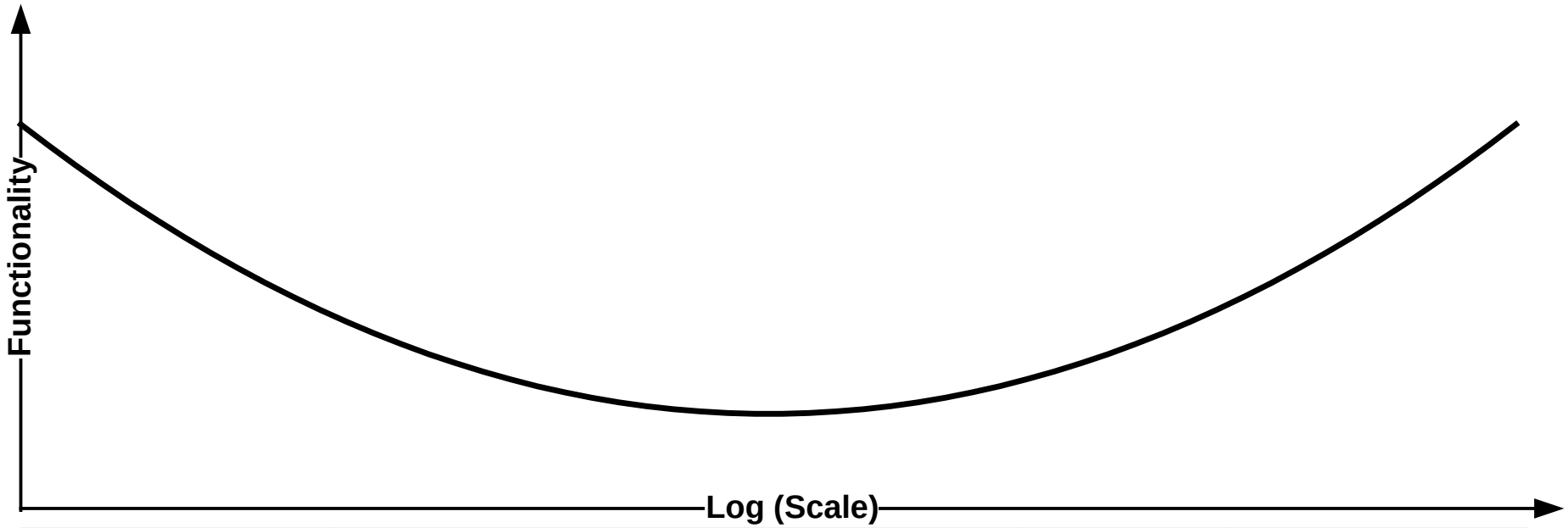


- Left side effect – tradeoff between Functionalities and Scale.
- Breaking point – acquisition of appropriate MIS
  MIS prevents 40% of MFIs to achieve fixed goals, of these 60% are small.



- Right side effect - Scale and Functionalities are positively correlated.
- Question:
  Why the initial tradeoff? Is it bad?
  Has to be avoided?
  Solutions?

The Curve



Phases in practice:

1. Tradeoff;
2. Breaking point;
3. (Exponential) growth.

Phases in theory:

1. (Constant) growth.

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The Paper

Client	MFI	Stakeholders

The tradeoff stage (1)

- Stage 1 (manual)
  - Almost unlimited number of data manipulations al lowest cost reporting the number of female borrowers is immediate
  - Changing a procedure or collecting new type of data is immediate.

- The extra 2 steps (+ investments):
  0. Investment in IT infrastructure (Hardware + Software);
  1. Conversion of information from paper to computerized data;
  - Data loss due to unsupported functionalities (photos, descriptions);
  + Computer assisted data treatment and generation of reports;
  2. Printing data / information on paper for reporting purposes.

- Stage 2 (semi-manual):
  - Built-in functionalities, possibility to use formulas and macros;
  - Facilitates scaling but imply a certain loss in functionalities;
  - New ratios - automatic calculation requires intervention of authorized specialized personnel that will update formulas or macros;
  - Limited to 5.000 loans per sheet (problem with 1 – many relationships).

The tradeoff stage (2)

- Stage 2 (semi-manual).

- The extra steps (+ investments):
  - Network;
  - Server;
  - DB software..

- Stage 3 (semi-automated):
  - Use of low-end database engines;
  - Centralized database / standardized forms;
  - No problem with one-to-many data relationships;
  - Interface required to work with data: queries and forms;
  - Access to raw data is impossible;
  - Even the procedure of counting current loans requires (hard) codding.

- Tradeoff: functionalities for possibility to continue (one-dimensional) scaling.

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The breaking point (3)

- MIS based on low-end database engines + own development prevents the MFI from scaling at a faster pace.

- 40% of MFIs have their MIS preventing them from achieving MFI's goals. Of these, 60% are institutions with less than 10,000 clients (CGAP, 2008)

- Breaking point intervenes when the MFI decides to acquires the appropriate off-the-shelf MIS.

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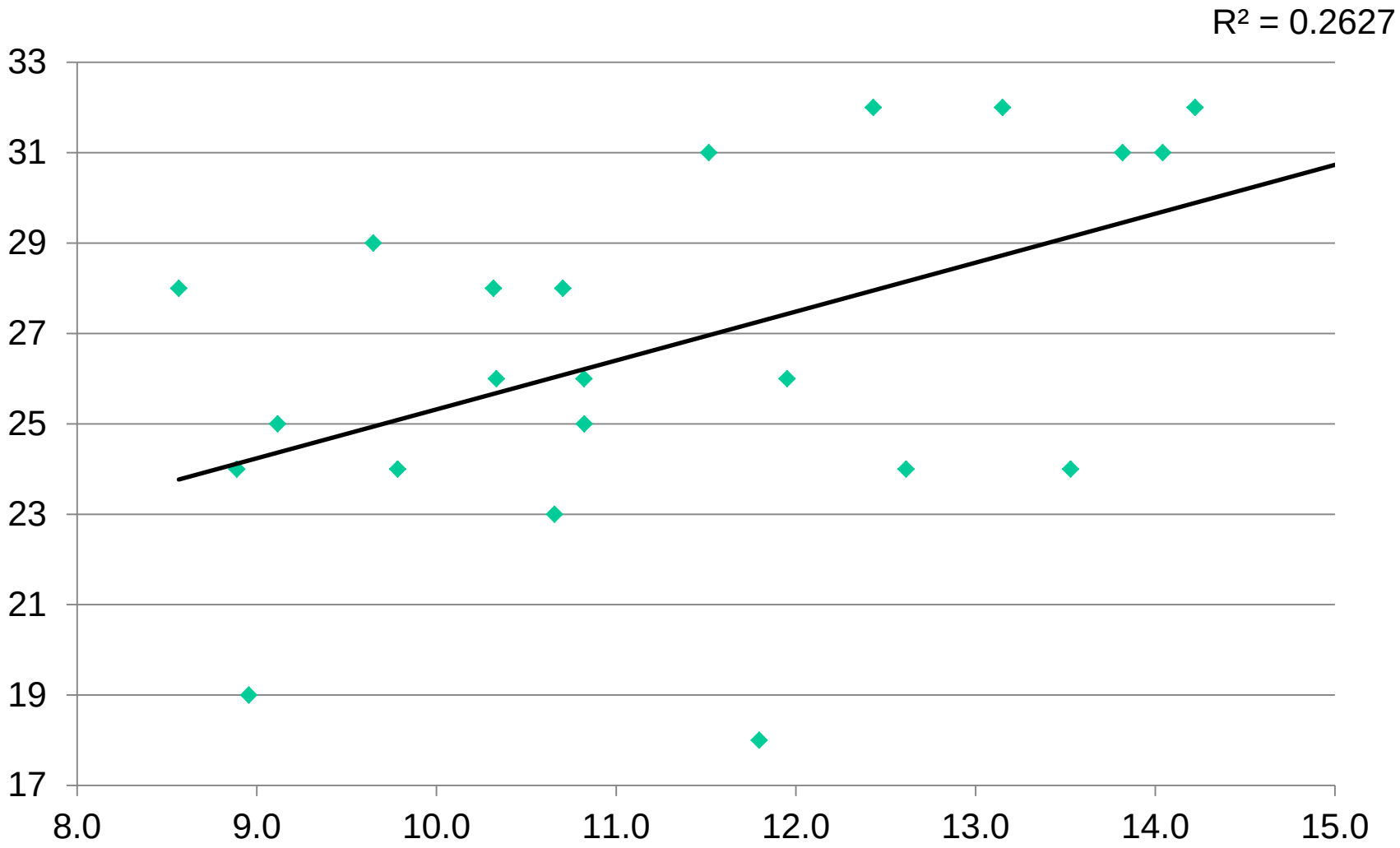
The positive correlation stage



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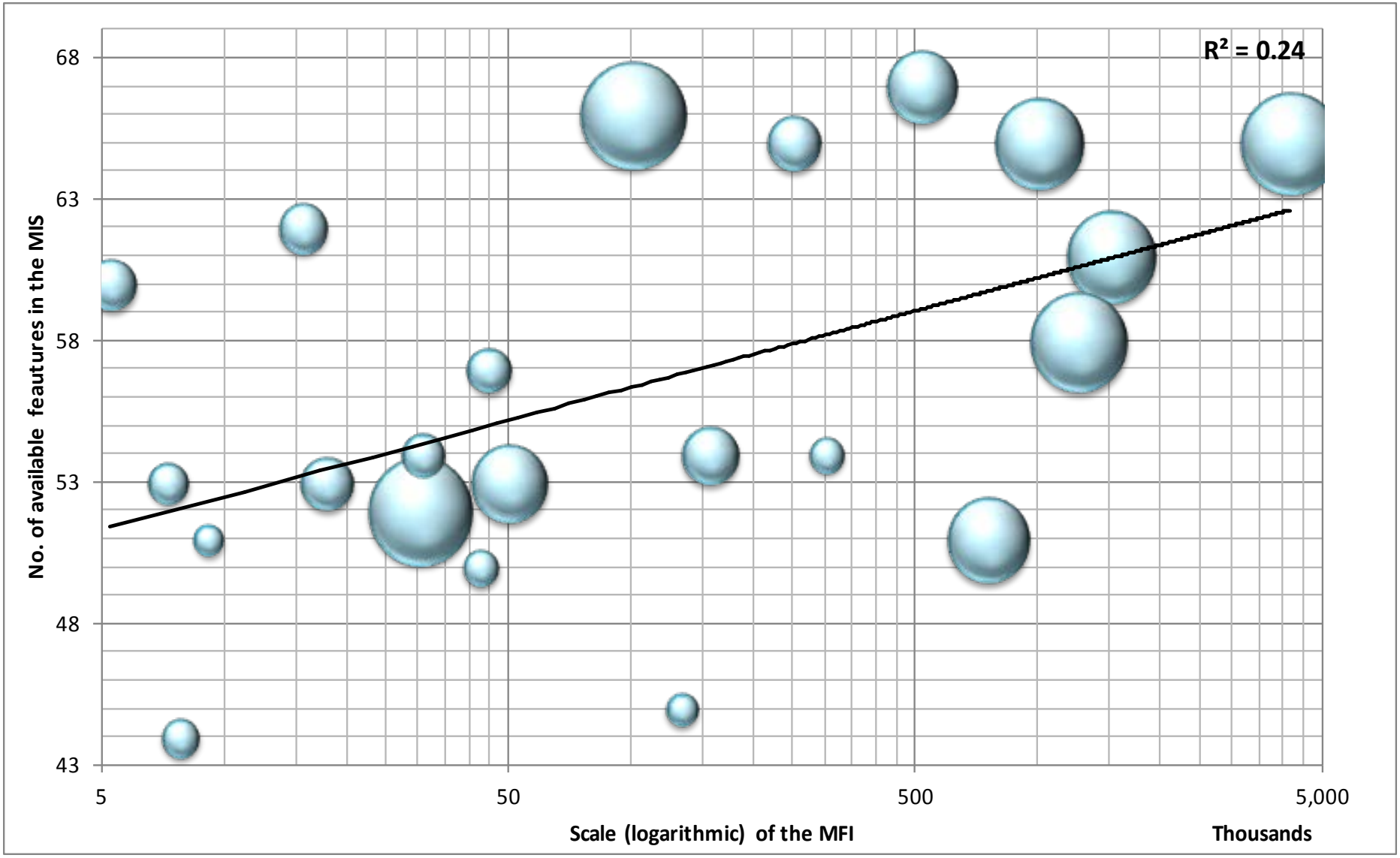
The positive stage & costs



The quality of the MIS

- ISO framework (ISO/IEC 25010:2011).

- The ISO Systems and software Quality Requirements and Evaluation (SQuaRE) identifies eight components of quality of MIS:

    1. functional suitability,
    2. reliability,
    3. operability,
    4. performance efficiency,
    5. security,
    6. compatibility,
    7. maintainability and
    8. transferability.

The quality data

- Functional suitability – the functionalities
- Reliability – proxy: the median level of the scale of clients (Max – Min)/2
- Operability – proxy: CGAP evaluation of “Ease of Use” of the MIS using a 4-points scale (1 - poor, 2 – fair, 3 – good, 4 – excellent)
- Performance efficiency – excluded as compensatory
- Security – sum of S features (data encryption, back-up, tracking)
- Compatibility – data export / import tools + accounting integration
- Maintainability – modification (parameterization), D audit and repair tools
- Transferability – transfer from one operational environment to another: a score composed of: Server OS + Workstation OS + DB requirements +

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Linear regression

$R^2 = .76$

Transferability	Maintainability	Compatibility	Security	Operability	Reliability	Functionality	B
(0.07)	0.02	(0.17)	(0.06)	0.28	0.05	0.12	(2.26)
0.03	0.03	0.06	0.04	0.10	0.04	0.02	0.62

$R^2 = .78$

MFI Clients	Transferability	Maintainability	Compatibility	Security	Operability	Reliability	Functionality	B
(0.00)	(0.06)	0.02	(0.13)	(0.05)	0.27	0.04	0.12	(2.20)
0.00	0.03	0.03	0.07	0.04	0.10	0.04	0.02	0.615

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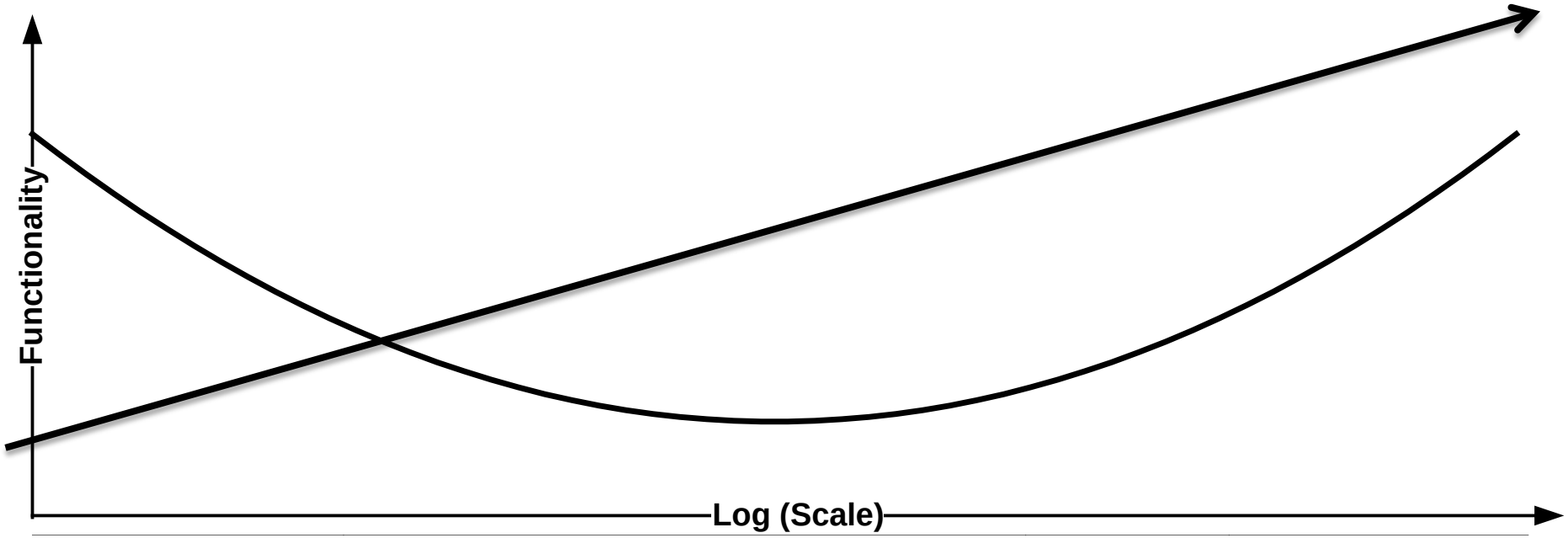
Conclusions



Thanks for your attention and comments!

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