getting rich from QoS models

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introduction

some trust projects:

- trust economics $\rightarrow$ probabilistic modelling to improve IT security decision making

- **instant trust $\rightarrow$ exploit economic mechanisms to achieve truth-telling in on-line collaborations**

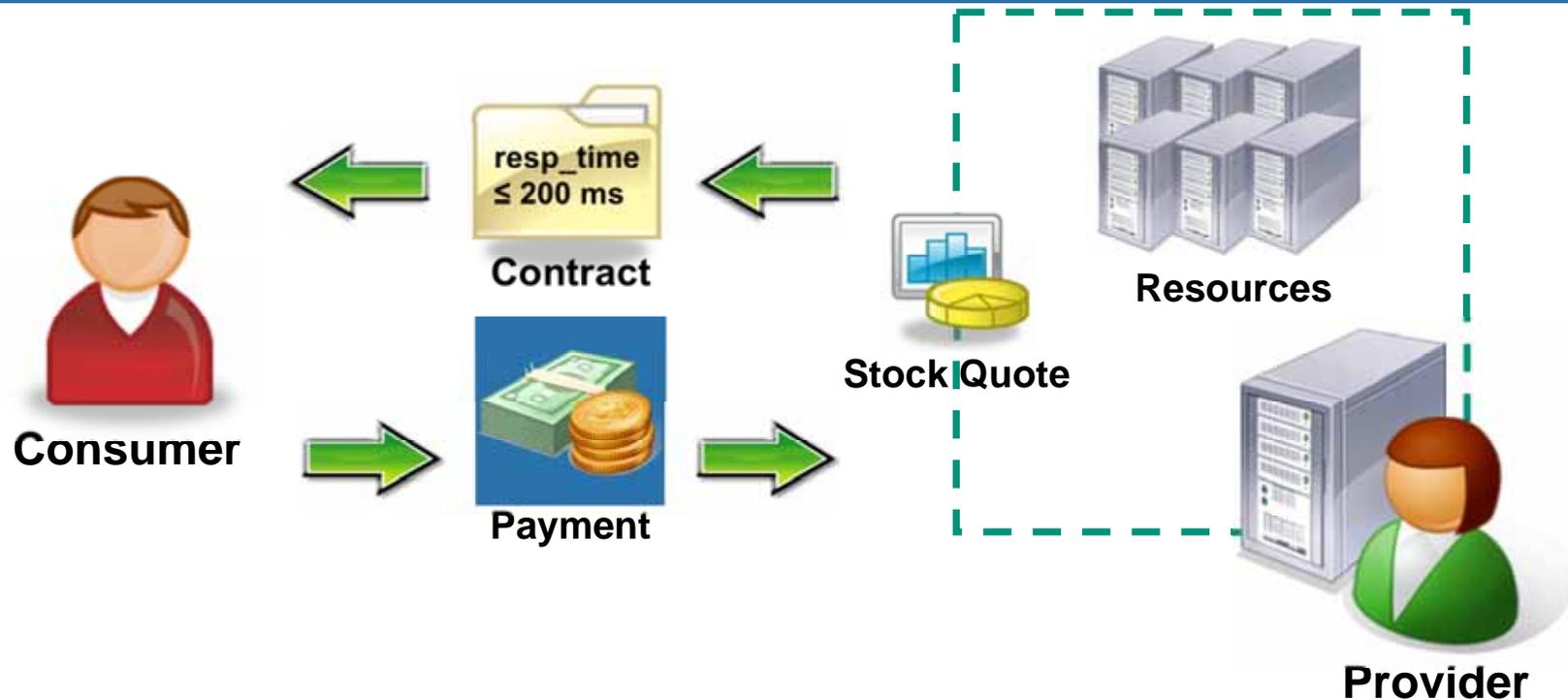- trust paths $\rightarrow$ p2p algorithms

introduction

a slightly different angle, claim:

good models for QoS prediction:

- provide a necessary target for business and process planning → SW development process
- allow a better handle on uncertainty, resulting in better profits → service provisioning

instant trust

how to make sure the provider tells the truth about QoS to be delivered?

set prices and penalties so that the provider makes most profit when being honest

how about uncertainty in QoS predictions

the provider loses money if he *lies* about QoS, and thus also if he is *wrong* about QoS

predicting of QoS critical → good model critical

in theoretical setting, one can distinguish:

- aleatory uncertainty → inherent and irreducible
- epistemic uncertainty → due to lack of knowledge, is reducible, e.g., caused by chosen abstractions or missing data

pricing, trust and uncertainty

we built a grid/cloud (Amazon S3) job scheduler

assume: Exp(λ) aleatory uncertainty (job length), where λ varies over time

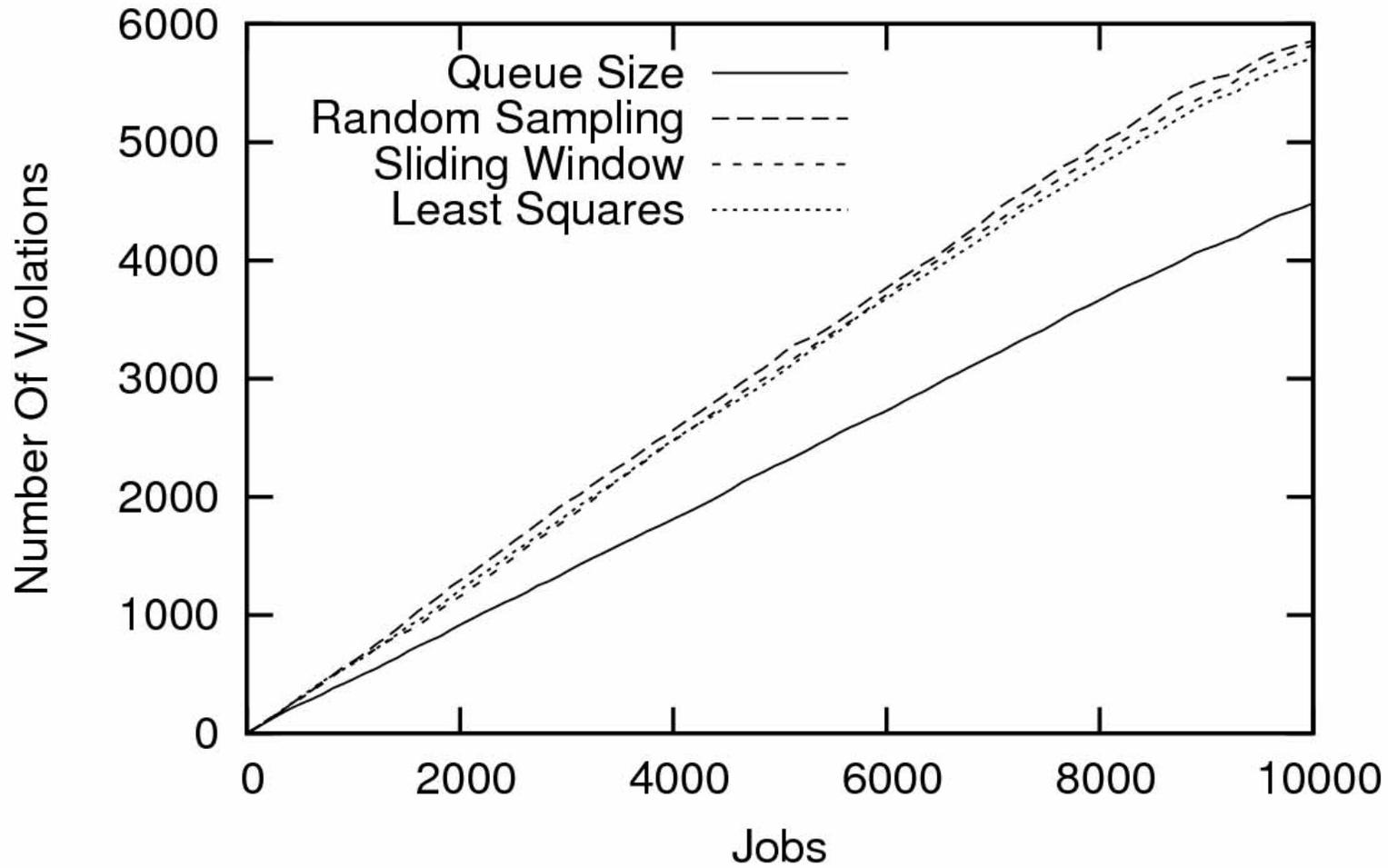what's the impact of epistemic uncertainty when QoS is predicted using:

- all samples
- sliding window of samples
- least-squares extrapolation
- queuing model

Cumulative Utility Earned By Performance Prediction Methods (b)
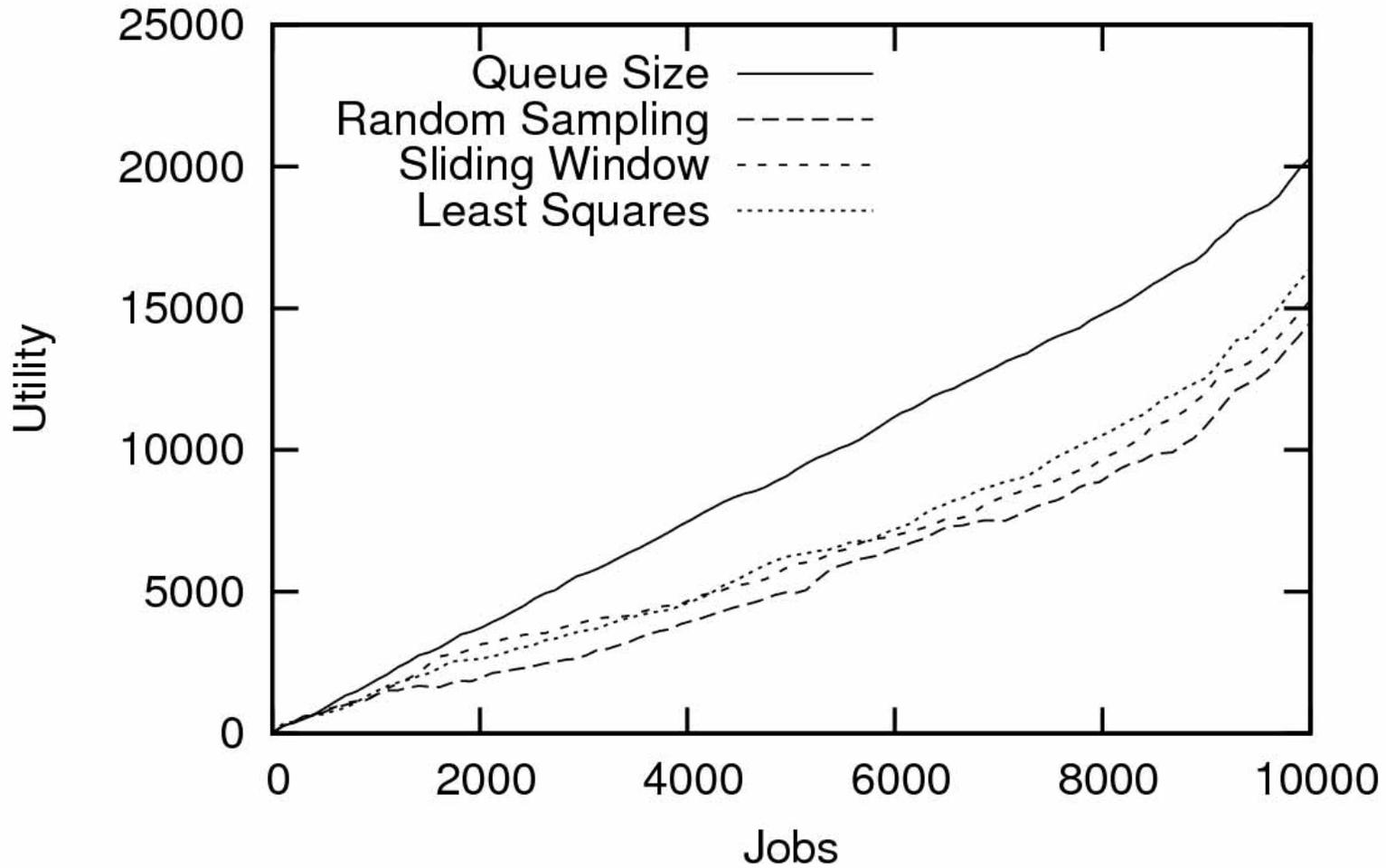
Number Of Violations Incurred By Performance Prediction Methods (d)

impact of good models

work behind the scenes: software and distributed algorithms for instant trust in service provision

this talk, claim: good models for QoS prediction have beneficial side effects (i.e., are needed for):

- better planning of SW development process
- better profits in service provisioning

the small example shows 20% profit difference for a job scheduling case