

Response to “Machine Learning and Central Banks: Ready for Primetime?”

*2021 BSP International Research Fair: Central Banking in the Time of Pandemic
13-14 July 2021, Virtual*

Mark Anthony Perez
BSP Department of Supervisory Analytics



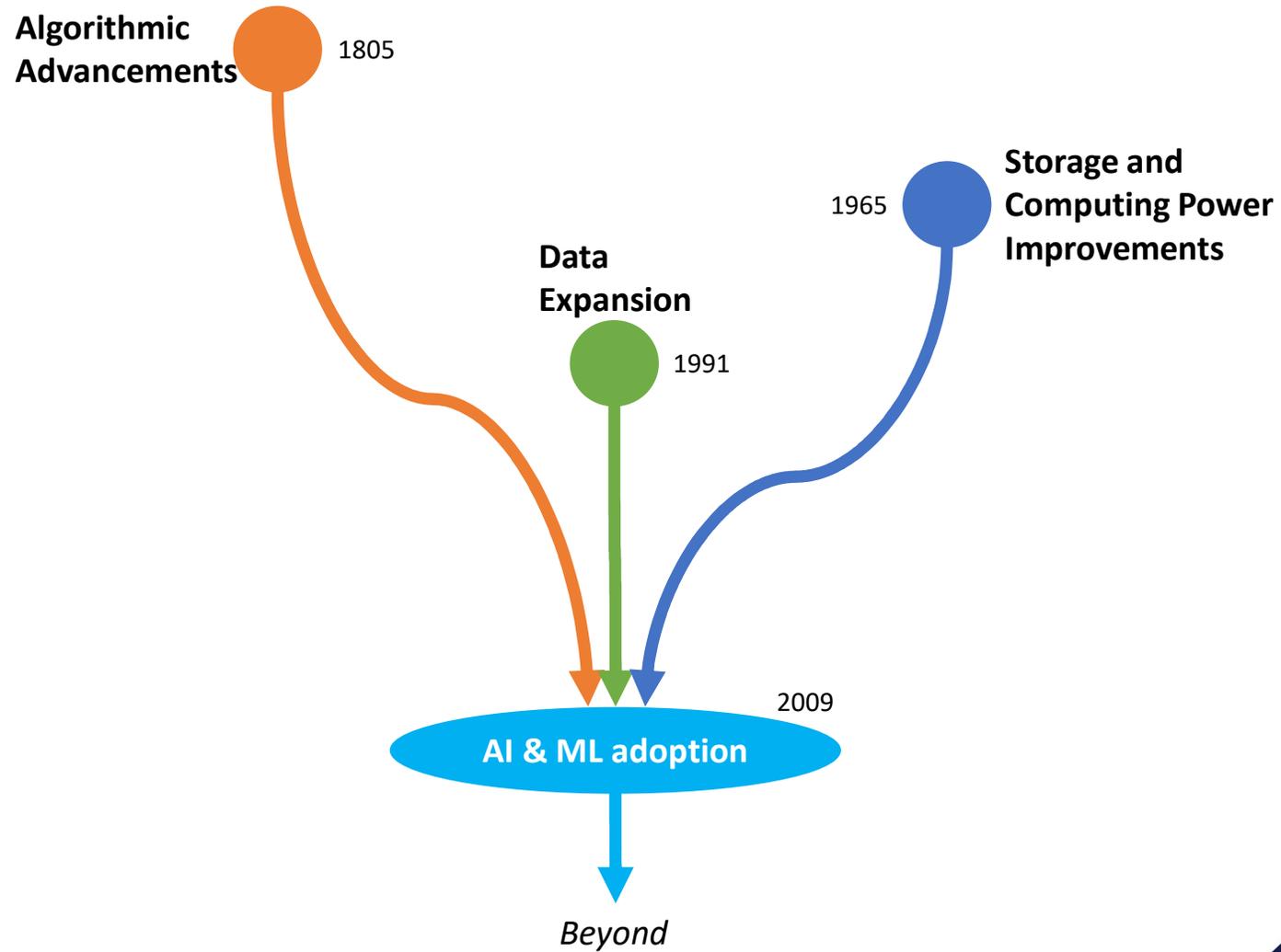
Disclaimer:

The views expressed in this presentation may contain personal opinions that do not necessarily reflect the views of the Bangko Sentral ng Pilipinas (BSP) or its Management.

No part of this presentation may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, mechanical, photocopying, recording or otherwise—without prior permission of the Financial Supervision Sector, Bangko Sentral ng Pilipinas.

*For comments, questions, or clarifications:
Mark Anthony B. Perez
Director, Department of Supervisory Analytics
Email: perezmb@bsp.gov.ph*





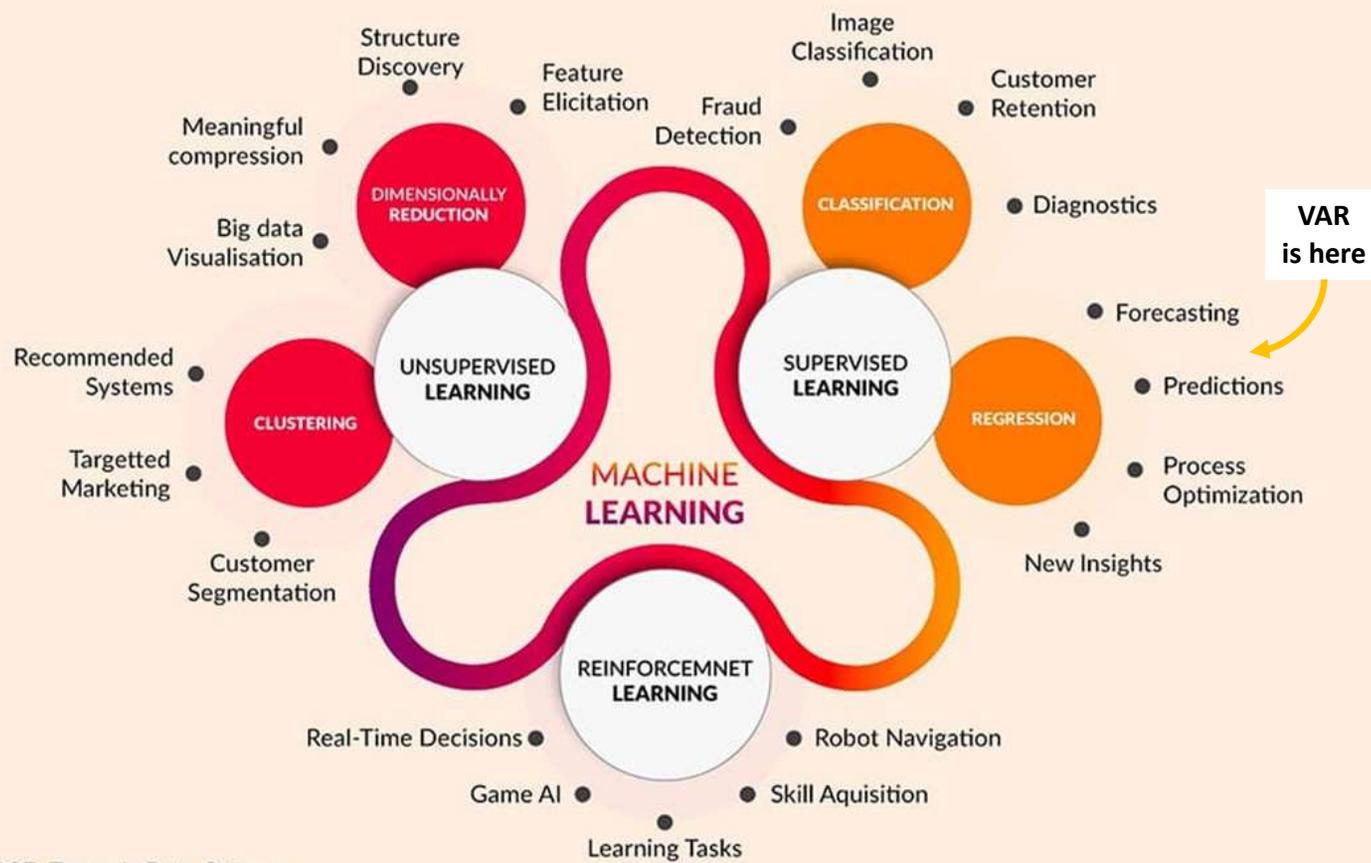
VAR

ML

Five Key Areas

- (1) Summarizing and analyzing data
- (2) Forecasting key macroeconomic variables
- (3) Conducting risk analysis and balance of uncertainties
- (4) Carrying out structural/causal as well as scenario analysis, and
- (5) Communicating and justifying policy decisions vis-à-vis the public





SOURCE: Towards Data Science



Machine Learning Adoption in the BSP

Monetary Policy

Use of non-linear machine learning approaches to develop regional inflation forecasting models

ML used: support vector regression (SVR), artificial neural networks (ANN), and long-short term memory (LSTM)

Financial Inclusion

Enhancement of Consumer Assistance Management System (CAMS) with an AI-ML powered Chatbot Functionality

ML used: cross-lingual natural language processing (NLP) technology, supervised machine learning model continuously teaches the chatbot to correctly interpret end-user "intents" and classify complaints into categories

Financial Supervision

Use of ML and AI tools to support goal of "Augmented Supervision"

ML used: ARIMA, SARIMA, kNN, GBM, Lasso, Decision Tree, Random Forest, Extra Trees, Gradient-boosting Regression, Natural Language Processing



Caveat emptor

- Weaknesses of machine learning techniques
- AI Explainability (XAI) or Interpretable Machine Learning (IML)
- Data Governance



In summary

- VAR (and its extensions) is a logical, somewhat analogous, entry point to ML adoption in central banks.
- When discussing ML applications in central banking, it is very important to explore the breadth and depth of ML applications beyond VAR.
- ML can be used in conjunction with traditional analysis to fill in the already existing gaps in traditional macroeconomics which structural models have generally failed to account for.
- Its use for policy analysis and formulation requires greater AI explainability and improved data governance.



End of presentation.

