

**Global Investment Research** 

### **The Economic Potential of Generative Al**

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### An Overview of Generative AI

### Step 1: Training Data to Neural Network

#### Previous ML methods:

Data trained on specialized databases for specific purposes (e.g., make statistical predictions about election results, answer questions about biomedical literature, etc.)

#### Generative AI:

Data trained on large, generalized databases (i.e., the entire internet); thus 1) wider range of use cases and 2) more easily able to spawn complementary innovations with specialized use cases ("deepening of AI").

#### Step 2: Neural Network to Al Output

Previous ML methods: Models generate statistical predictions based on relationships in training data.

#### **Generative AI:**

Models seek to generate new information that is indistinguishable from human data. Achieved via the introduction of a second "discriminative" neural net, which evaluates the output of the primary "generative" neural net for authenticity relative to human output. This "adversarial neural networks" approach forces the generative network to revise its output and learn to consistently "fool" the discriminative network.

### Step 3: Al Output to Human Interface

#### Previous ML methods:

Users must use specific code or syntax to make narrow requests based on the model's intended function.

#### Generative AI:

Use of large language models (LLMs) allows for advanced natural language processing (NLP) that ncorporates context in larger swaths of text, enabling a wider variety of requests and a more accessible interface for human-Al interaction.

#### **Step 4: Applications**

Previous ML methods: - Text classification - Facial and image recognition Statistical prediction and inference

#### Generative AI:

- Answer complex textual questions with human-like language and structure
- Create original images, graphics, and video based on user queries
   Generate and explain code which can be used for other programming and data science applications

#### Three key changes:

Generalized rather than specialized - wider use cases and more complementary innovations
 Generative rather than descriptive - can produce original results indistinguishable from human output
 Approachable rather than technical - can interface via complex and contextual natural language



### One-Fourth of Current Work Tasks Could Be Automated by AI in the US and Other DMs



### Larger Estimates Assume the Automation of Physical Tasks Less; Maybe Less Likely in Near Term



### Replacement in Legal and Administrative Fields, Productivity-Enhancement Elsewhere



# Technological Innovation Drives Employment Growth



Source: Goldman Sachs Global Investment Research.

### Generative AI Could Boost Aggregate Labor Productivity Growth in the US and Other DMs



## Significant Upside to Global GDP...



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### ... But Productivity Growth Is Otherwise Slowing Barring Further Technological Advancement...



# ... ICT Investment Has Driven Recent Productivity Growth (and Could Be Double-Counted)...



### Goldman (and Hard to Predict) Soldman (and Hard to Predict)



# Most Companies Expect to Start Using Generative AI in the Next 3-10 Years



### Moderate Upside to Potential Growth



## A Sizable Investment Cycle Is Possible



### Market Implications of AI: Equities Biggest Beneficiary; Effect on Rates Depends on Whether Anticipated

Asset Class:	Equities	FX	Interest rates	Commodities
Anticipated	Equities rise up front, valuations increase.	Appreciation pressure for DM from structural rerating and cyclical boost. USD may benefit as early adopter and beneficiary of "investment phase".	Interest rates likely higher as domestic spending rises. Neutral rate may shift higher.	Commodity prices higher than baseline as cyclical pressures build.
Unanticipated	Equities rise more gradually in line with earnings.	Gradual upward pressure on DM equilibrium FX rates. Less scope for cyclical outperformance.	Greater chance of disinflation. Policy could remain tighter than needed. Less pressure on neutral rate.	Commodities rise more gradually vs baseline as incomes rise.