# The economic benefits of open foundation models

Research note prepared by Mandala

MANDALA

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# Contents

*This study estimates the core economic benefits of open foundation models for businesses in the US economy. This considers profit uplift, operational efficiencies and cost savings in rent reductions for US businesses having access to open foundation models versus closed foundation models.*

*To inform the US National Telecommunications and Information Administration consultation on "Dual Use Foundation Artificial Intelligence Models With Widely Available Model Weights", this study estimates the benefits of a 'diverse' generative AI ecosystem, where both open and closed foundation models exist and are available to access, against the counterfactual of a 'restricted' ecosystem where only closed foundation models are available.*

M A N D A L A

# Open foundation models could support faster adoption of generative AI amongst US businesses and provide an additional $1.5 trillion in benefits for them in 2035

## Access to open foundation models in a diverse ecosystem could support faster adoption of generative AI by businesses

The **transparency**, **competition** and **innovation** supported by open foundation models could accelerate the adoption of generative AI by US businesses in 2035

*% of US businesses adopting generative AI in 2035*

**+26 ppt**

**64%**

38%

**Scenario 1: Diverse ecosystem**

*Future generative AI ecosystem is diverse as it includes highly-capable open and closed foundation models (similar to the current state)*

**Scenario 2: Restricted ecosystem**

*Future generative AI ecosystem is restricted to closed foundation models by government regulation or other competitive dynamics*

## The additional benefits of open foundation models for US businesses in 2035

### $1.5 trillion

in additional benefits for US businesses in 2035 from wider adoption of useful AI technology in a diverse ecosystem versus a restrictive ecosystem

**$0.2 trillion**
additional **uplift in profit** from new goods and services

**+**

**$0.9 trillion**
cost savings from **efficiencies** on current operating costs

**+**

**$0.4 trillion**
cost savings from **rent reduction** on closed foundation models

Note: Benefits are in real terms.
Source: Mandala analysis.

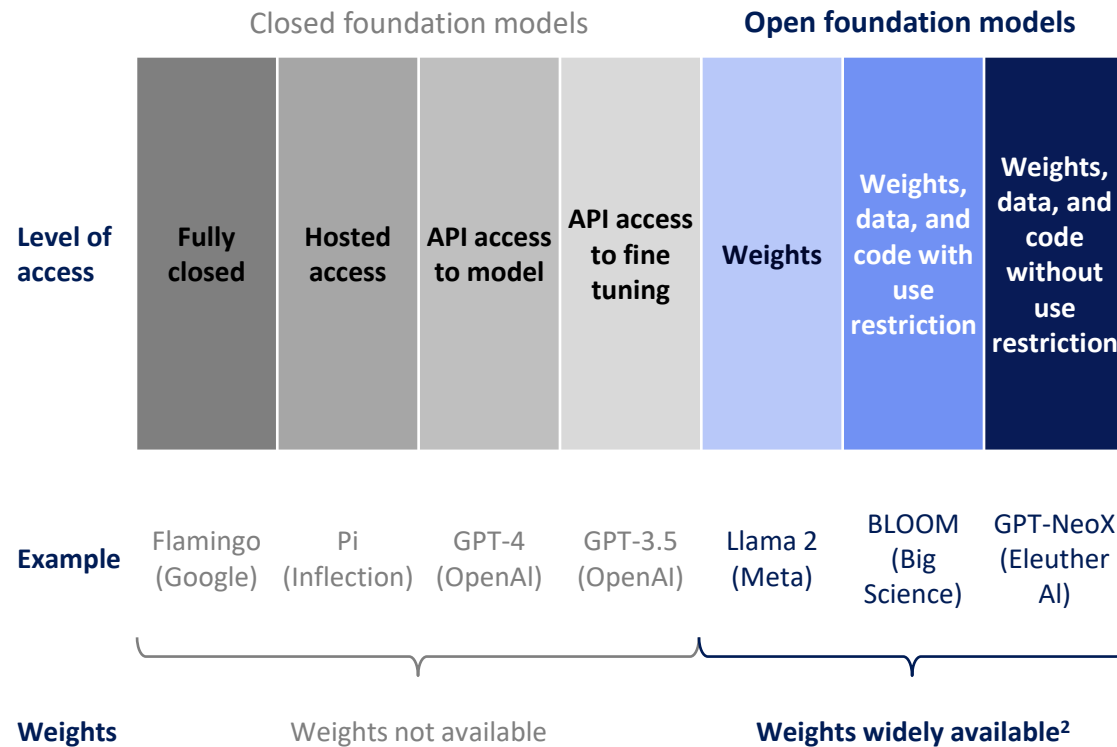| | |
|---|---|
| **1** | **Context**: Open foundation models are a significant and growing part of a diverse generative AI ecosystem |
| **2** | **Approach:** To estimate the benefits of open foundation models we modeled the adoption of generative AI across two scenarios |
| **3** | **Key findings:** A diverse generative AI ecosystem that drives wider adoption could provide $1.5T of additional business benefits in 2035 |

# Open models allow developers to access, deploy, and modify the model…

# …which has played a key role in growing developer activity in generative AI

**Exhibit 1: Definition of an open foundation model[1]**

| | Closed foundation models | | | | Open foundation models | | |
|---|---|---|---|---|---|---|---|
| **Level of access** | **Fully closed** | **Hosted access** | **API access to model** | **API access to fine tuning** | **Weights** | **Weights, data, and code with use restriction** | **Weights, data, and code without use restriction** |
| **Example** | Flamingo (Google) | Pi (Inflection) | GPT-4 (OpenAI) | GPT-3.5 (OpenAI) | Llama 2 (Meta) | BLOOM (Big Science) | GPT-NeoX (Eleuther AI) |
| **Weights** | | Weights not available | | | | **Weights widely available[2]** | |

**Exhibit 2: Number of public generative AI projects on GitHub**

*2016 – 2023*
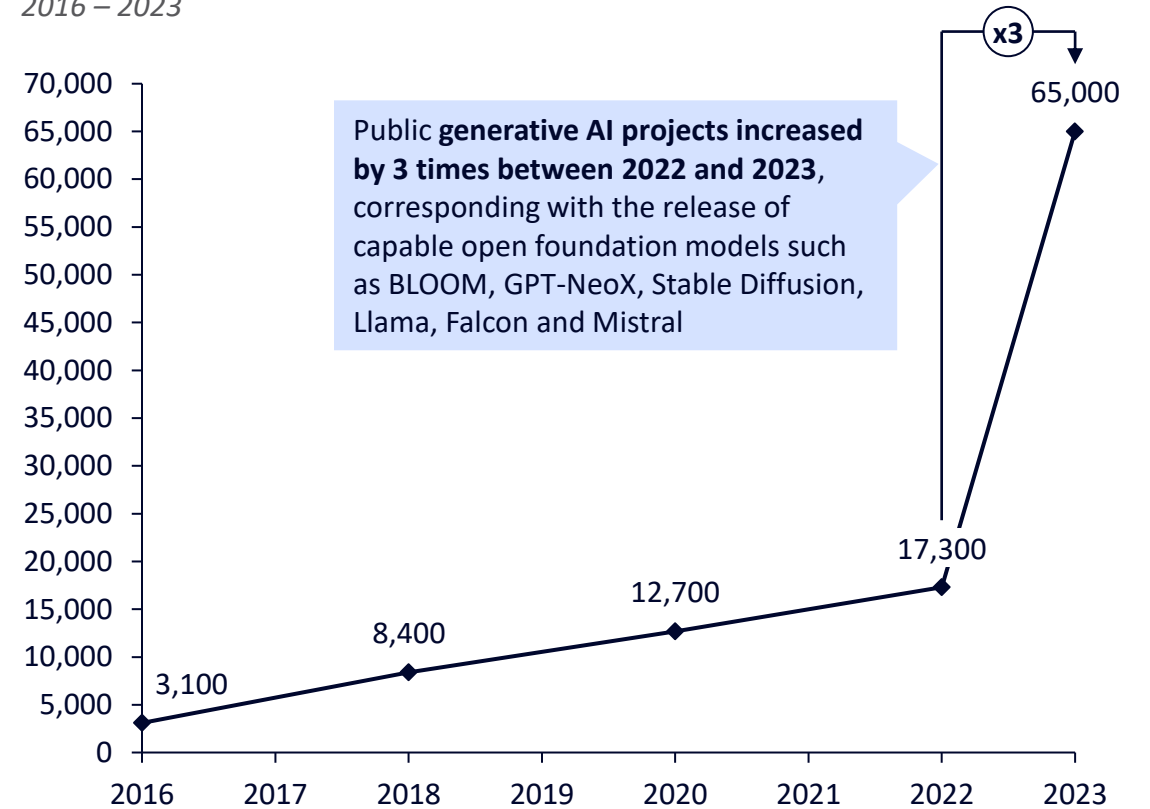
Public **generative AI projects increased by 3 times between 2022 and 2023,** corresponding with the release of capable open foundation models such as BLOOM, GPT-NeoX, Stable Diffusion, Llama, Falcon and Mistral

x3

- 2016: 3,100
- 2018: 8,400
- 2020: 12,700
- 2022: 17,300
- 2023: 65,000

# Open foundation models support transparency, competition and innovation, and are likely to drive higher adoption of generative AI across the US economy

**Exhibit 3: Open foundation models, like other open source technologies, drive three key outcomes**

## Transparency

**Open model weights allows researchers and authorities to inspect, test, modify and deploy models independently**

Experiences suggests US IT professionals recognize the security benefits of open source

**90%** of US IT executives believe enterprise open source is as secure or more secure than proprietary software.[1]

**55%** state the security benefits are driven by (i) the fact their team can use well-tested open source code, and (ii) this code can be use for in-house applications.[1]

## Competition

**As seen with other technologies, open sourcing puts downward pressure on costs and gives businesses greater flexibility and choice**

The top reason businesses use open source software is its cost competitiveness

Reasons for use of OSS (% of survey respondents)[2]

- Low cost: 37%
- Functionality: 31%
- Stability: 28%

## Innovation

**Publishing model weights enables developers to collaborate on fine tuning and crowdsource better, safer models**

Open source models are already supporting thousands of third-party fine tuned models

Number of third-party variant models publicly released to date[3]

- SDXL (Stability AI): 2,036
- Mistral & Mixtral (Mistral AI): 4,955
- Llama (Meta): 12,132
- T5 (Google): 13,547
- BERT (Google): 44,395

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The characteristics of open foundation models are likely to drive higher adoption of generative AI across the US economy.
To estimate the economic benefits of open foundation models in the US we have considered two scenarios: a diverse vs restricted generative AI ecosystem.

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1 Red Hat (2022) *The State of Enterprise Open Source: A Red Hat report*.
2 Open Logic (2024) *State of Open Source Report*. Original response labels for 'Low Cost', 'Functionality' and 'Stability' were 'No License Cost, Overall Cost Reduction', 'Functionality Available to Improve Development Velocity' and 'Stable Technology with Community Long-Term Support' respectively.
3 Stability AI analysis. These are approximate totals: models may be over- or underrepresented due to inconsistencies in naming conventions and model disclosure

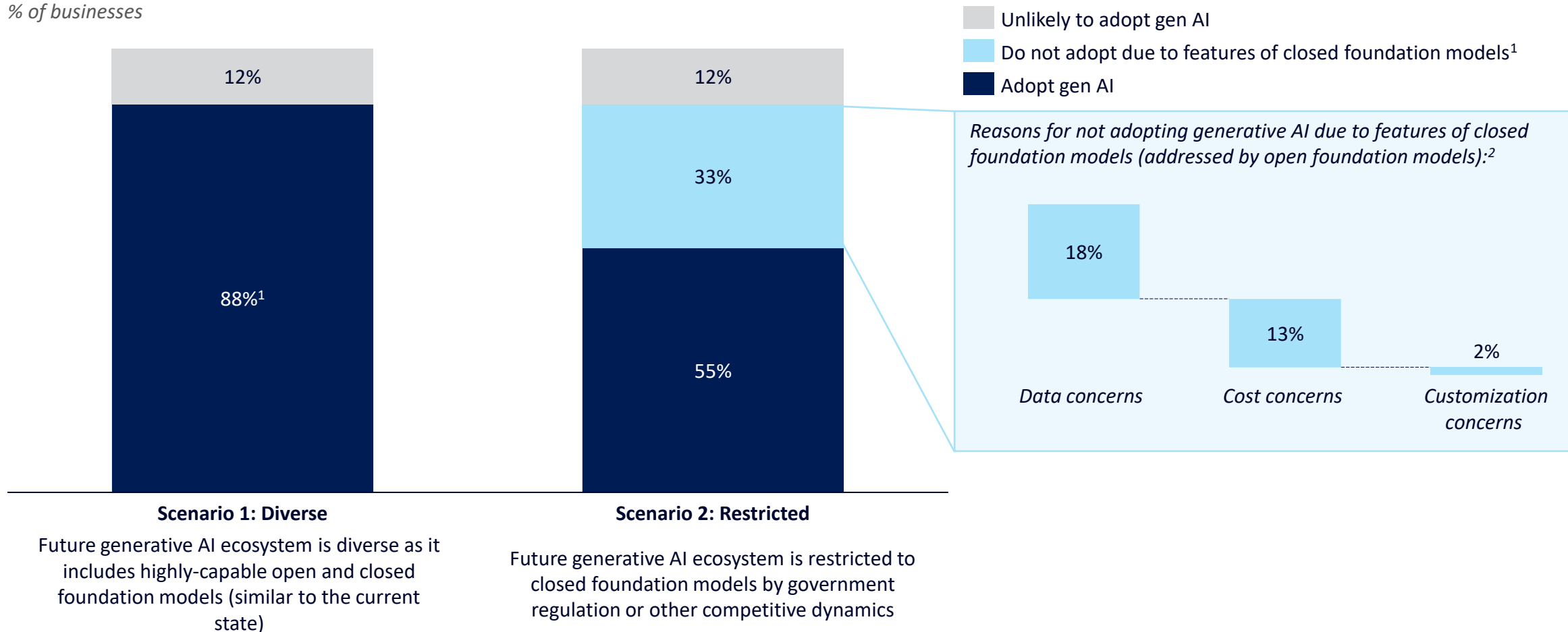| 1 | **Context:** Open foundation models are a significant and growing part of a diverse generative AI ecosystem |
|---|---|
| 2 | **Approach:** To estimate the benefits of open foundation models we modeled the adoption of generative AI across two scenarios |
| 3 | **Key findings:** A diverse generative AI ecosystem that drives wider adoption could provide $1.5T of additional business benefits in 2035 |

# To estimate the economic benefits of open foundation models we have considered two scenarios: a diverse vs restricted generative AI ecosystem

**Exhibit 4: Projected maximum US business adoption of foundation models by scenario**

*% of businesses*



Legend:
- Unlikely to adopt gen AI
- Do not adopt due to features of closed foundation models[1]
- Adopt gen AI

**Scenario 1: Diverse**
12%
88%[1]

**Scenario 2: Restricted**
12%
33%
55%

*Reasons for not adopting generative AI due to features of closed foundation models (addressed by open foundation models):[2]*

- Data concerns — 18%
- Cost concerns — 13%
- Customization concerns — 2%

**Scenario 1: Diverse**
Future generative AI ecosystem is diverse as it includes highly-capable open and closed foundation models (similar to the current state)

**Scenario 2: Restricted**
Future generative AI ecosystem is restricted to closed foundation models by government regulation or other competitive dynamics
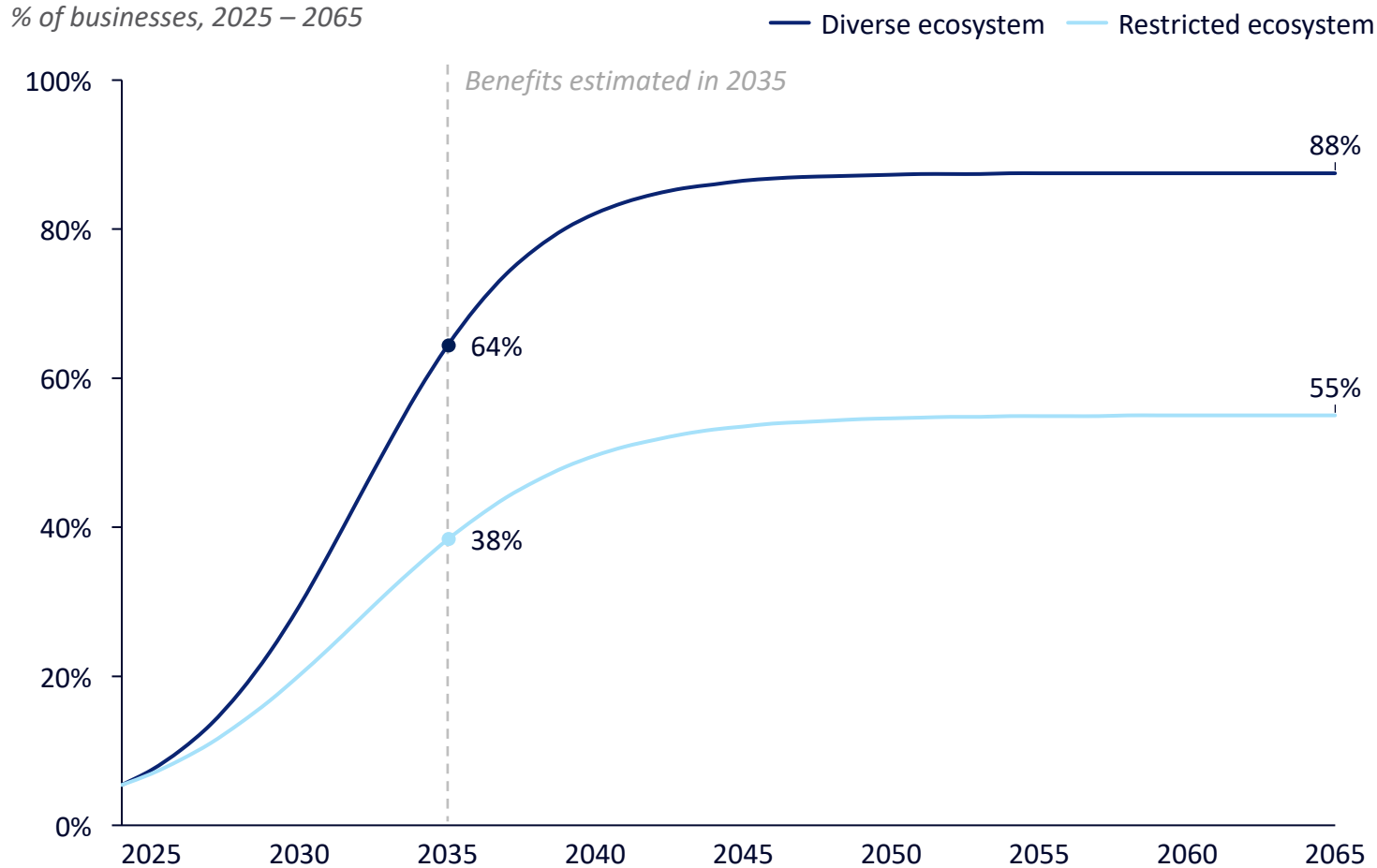
Note: Goldman Sachs (2023) *Upgrading our Longer-Run Global Growth Forecasts to Reflect impact of Generative AI*, estimate 'full adoption' of generative AI between 80-95% of businesses. We take the midpoint (87.5%) as our estimate, and validate against saturation rates of other technologies, including household internet usage, cloud usage and digitized information. This represents a conservative estimate of full adoption of generative AI.
1 Predibase (2023) *Large Language Models in Production*.
Source: Mandala analysis.

# We then modeled likely adoption curves for generative AI across the two scenarios

**Exhibit 5: Projected maximum US business adoption of foundation models by scenario**

*% of businesses, 2025 − 2065*

Diverse ecosystem — Restricted ecosystem

*Benefits estimated in 2035*

88%

64%

55%

38%

2025  2030  2035  2040  2045  2050  2055  2060  2065

- The availability of open foundation models (and resulting transparency, competition and innovation) may help to increase the speed and scale of adoption compared to the restricted generative AI ecosystem.

- This pattern can be modeled as an 'S-Curve':

$$P(t) = \frac{L}{1 + e^{-k(t-t_o)}}$$

Where:
- $P(t)$ is the predicted adoption rate at time t
- $L$ is the maximum value

- $k$ is the growth rate
- $t_o$ is the inflection point
- $e$ is the natural based logarithm

- The variables were modeled by using Census Bureau data for current levels of generative AI adoption,[1] existing adoption studies,[2] and comparisons to adoption of the internet, cloud computing and other digital technologies. See appendix for details.

**1**    **Context:** Open foundation models are a significant and growing part of a diverse generative AI ecosystem

**2**    **Approach:** To estimate the benefits of open foundation models we modeled the adoption of generative AI across two scenarios

**3**    **Key findings:** A diverse generative AI ecosystem that drives wider adoption could provide $1.5T of additional business benefits in 2035
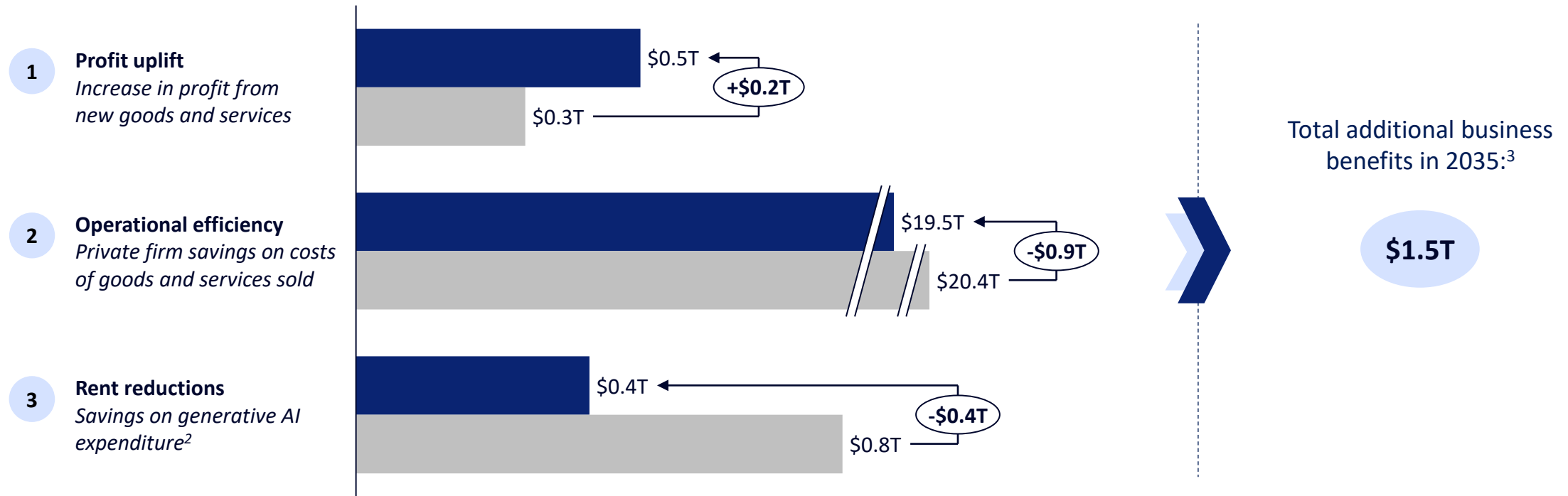
# A diverse generative AI ecosystem, with higher adoption than a restricted ecosystem, could generate $1.5 trillion in additional benefits for US businesses in 2035

**Exhibit 6: Present value of additional economic benefits from a diverse generative AI ecosystem[1]**

*Real $US trillions, 2035*



Legend: ■ Diverse ecosystem  ■ Restricted ecosystem

**1** **Profit uplift**
*Increase in profit from new goods and services*
- $0.5T
- $0.3T
- +$0.2T

**2** **Operational efficiency**
*Private firm savings on costs of goods and services sold*
- $19.5T
- $20.4T
- -$0.9T

**3** **Rent reductions**
*Savings on generative AI expenditure[2]*
- $0.4T
- $0.8T
- -$0.4T

Total additional business benefits in 2035:[3]

**$1.5T**

# Profit uplift: US businesses could generate an additional $0.2T profit in 2035 in a diverse generative AI ecosystem compared to a restricted ecosystem

**Exhibit 7: Present value of profit uplift by scenario**

*Real $US trillions, 2035*

- Generative AI enables businesses to create new and more goods and services, which drive additional sources of profit
- Therefore, in a diverse ecosystem, more businesses adopt generative AI and create more of these goods and services
- As a result, **US businesses could generate an additional $0.2 trillion in profit** in 2035 alone

+$0.2T

$0.5T

$0.3T

Diverse

Restricted
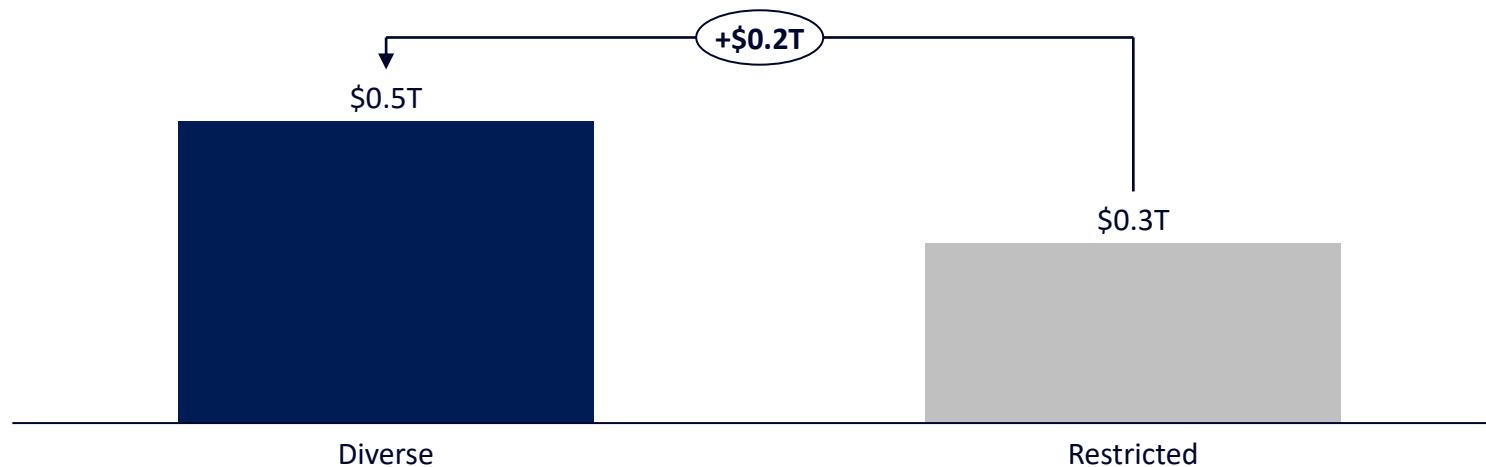
**Key assumptions**

- In both scenarios, we assume a business increases its revenue by 4.8% after adopting generative AI. This is a weighted average of the revenue uplifts from AI adoption found in McKinsey (2023).

- In both scenarios, we assume gross profit margin per business is 28.2%, based on economy wide data from the Bureau of Economic Analysis (2023).

- As shown in Exhibit 5, more businesses adopt generative AI in the diverse scenario compared to the restricted scenario. Therefore, more businesses realize profit gains in the diverse scenario compared to the restricted scenario.

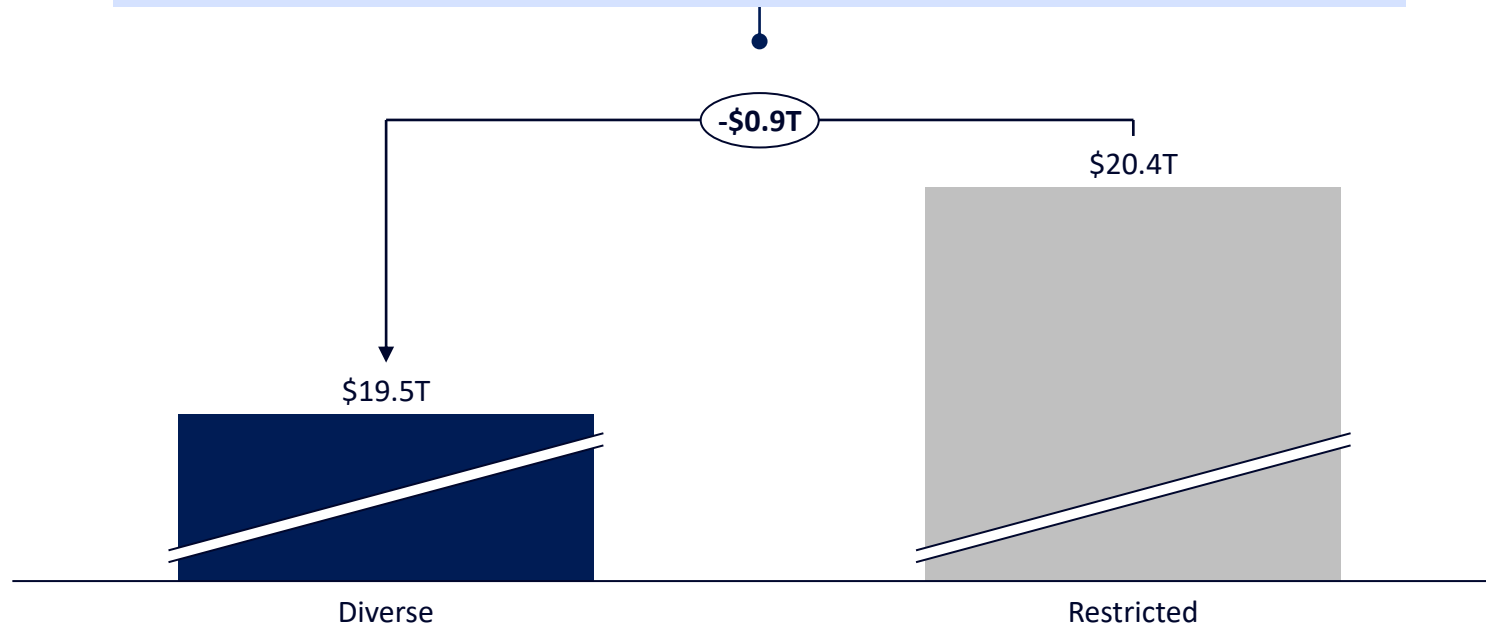- Business revenue is equal to private industries gross output (sales or revenue): Bureau of Economic Analysis (2023).

Source: McKinsey (2023) *The state of AI in 2023—Generative AI's breakout year*; Bureau of Economic Analysis (2023) *Components of Value Added by Industry and Gross Output by Industry;* US Census Bureau (2023) *The Number of Firms and Establishments, Employment, and Annual Payroll by State, Industry, and Enterprise Employment Size*; Mandala analysis.

# Operational efficiency: US businesses could save an additional $0.9T in operational efficiencies in 2035 in a diverse generative AI ecosystem

**Exhibit 8: Present value of total private industry costs by scenario**

*Real $US trillions, 2035*

**Key assumptions**

- Generative AI enables businesses to automate and streamline business processes, producing the same goods and services with fewer inputs
- Therefore, in a diverse ecosystem, more businesses are adopting generative AI and generating operational efficiencies
- As a result, **US businesses could realize an additional $0.9 trillion in efficiency gains** in 2035 compared to a restricted ecosystem

-$0.9T

$20.4T

$19.5T

Diverse

Restricted

- In both scenarios, we assume businesses decrease operating costs by 8.7% after adopting generative AI. This is a weighted average of cost savings from AI adoption found in McKinsey (2023).

- As shown in Exhibit 5, more businesses adopt generative AI in the diverse scenario compared to the restricted scenario. Therefore, more businesses realize efficiency gains in the diverse scenario compared to the restricted scenario.

- Business costs are equal to private industries gross output (sales or revenue) minus private industries gross operating surplus: Bureau of Economic Analysis (2023).

# Rent reductions: US businesses could save $0.4T on expenditure for closed foundation models in 2035 in a diverse generative AI ecosystem

**Exhibit 9: Present value of generative AI product expenditure by scenario**

*Real $US trillions, 2035*

- Open foundation models and related products cost less to use than closed foundation models
- Therefore, the presence of cheaper generative AI products (open foundation models) in the market will drive competition and decrease overall costs
- As a result, **US businesses could save $0.4T** on expenditure for generative AI in 2035 compared to a restricted ecosystem
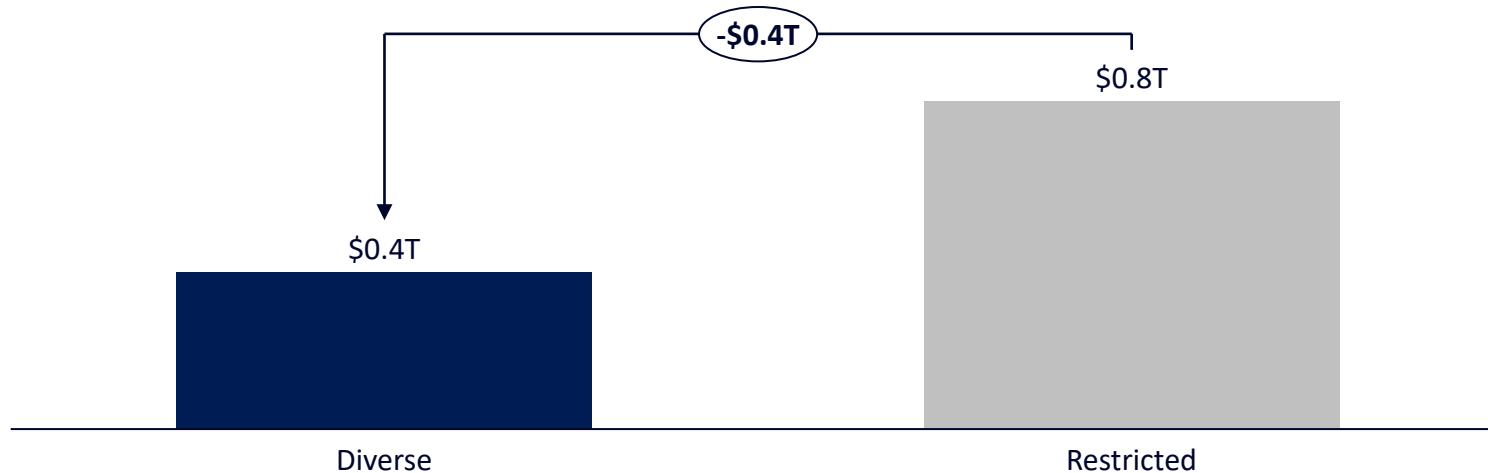
-$0.4T

$0.8T

$0.4T

Diverse

Restricted

**Key assumptions**

- In both scenarios, we assume individual business expenditure on IT grows to 7% of revenue by 2035 (growing from 6% in 2025): Deloitte (2023).

- In both scenarios we assume individual business expenditure on generative AI will grow to 15% of their IT budget by 2035 (growing from 5% in 2025): Bloomberg Intelligence (2023).

- Finally, studies indicate business spend on generative AI could be 3.5 times higher if open foundation models did not exist (based on estimated spend on software if open source software did not exist): Harvard Business School (2024).

- See appendix for the full methodology.

Source: Bloomberg Intelligence (2023) *Generative AI to Become a $1.3 Trillion Market by 2032, Research Finds*; Harvard Business School (2024) *Value of Open Source Software*; Deloitte (2023) *Global Technology Leadership Study*; Mandala analysis.

# We first estimated the max adoption of generative AI by US businesses across the two scenarios

Full adoption of generative AI will be reached when the market is at maximum saturation.

In the diverse scenario, it is estimated that full adoption will be reached with 88% of businesses using generative AI to produce goods and services.
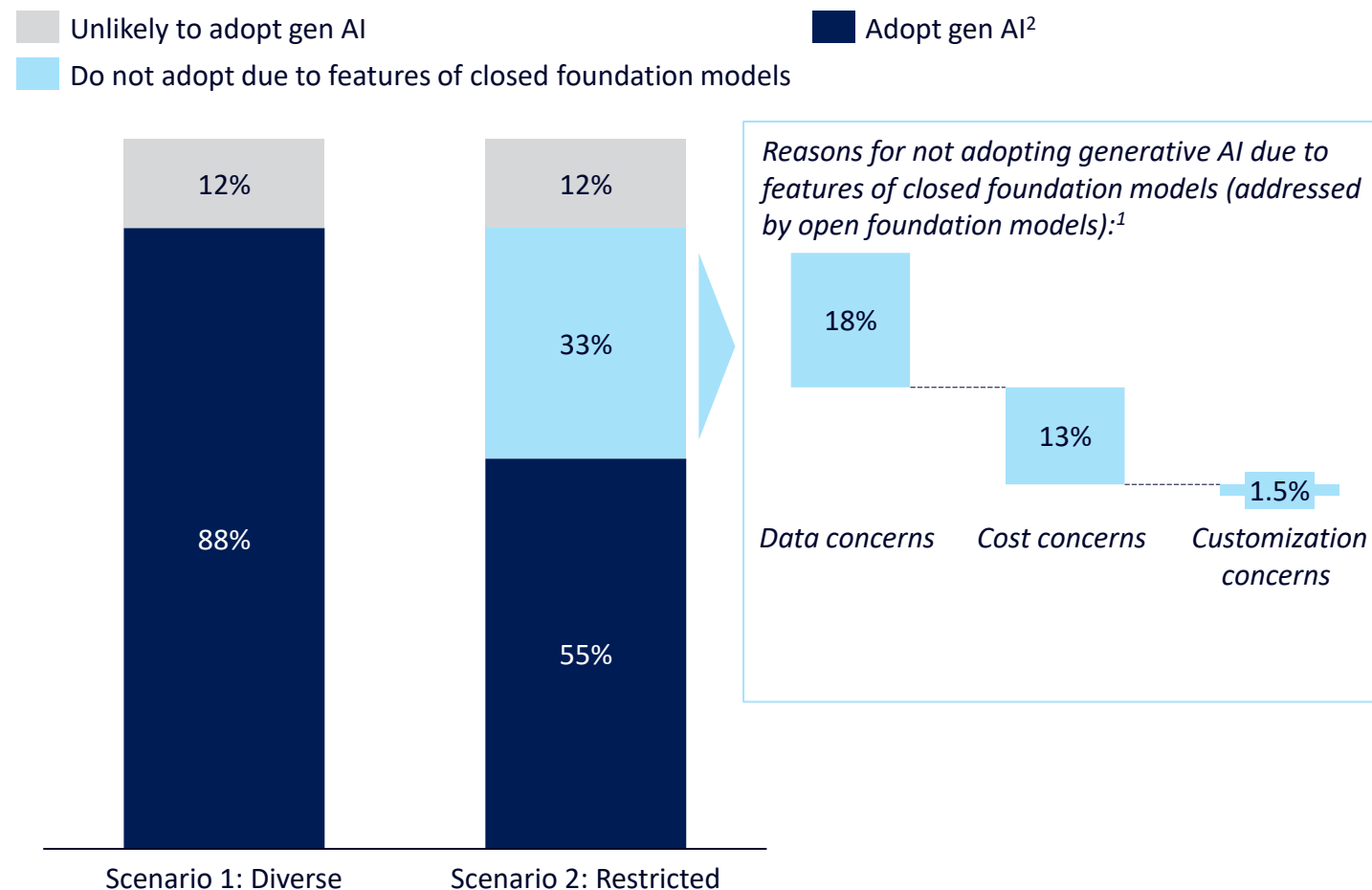
This estimate is the midpoint of Goldman Sachs' estimate of full generative AI adoption at 80% to 95% of businesses.[1] This estimate has been validated against the saturation rate of other technologies, including household internet usage, cloud usage and digitized information.

In the restricted scenario, fewer businesses will adopt generative AI given the unavailability of open foundation models, and the features of closed foundation models. It is estimated that full adoption in the restricted scenario is 55% of businesses.

This accounts for current rates of businesses that report not using generative AI due to data security concerns (36%), cost concerns (13%) and customization (3%)[2] and assumes that these proportions will decrease over time (to 18%, 13% and 1.5% respectively), as closed foundation model developers address some of these concerns e.g. OpenAI's finetuning options.

At full adoption, 33% of businesses are unlikely to adopt generative AI in the 'restricted' scenario.

**Exhibit A1: Projected maximum US business adoption of foundation models by scenario**

*% of businesses*

Legend:
- Unlikely to adopt gen AI
- Do not adopt due to features of closed foundation models
- Adopt gen AI[2]



*Reasons for not adopting generative AI due to features of closed foundation models (addressed by open foundation models):[1]*

Data concerns: 18%
Cost concerns: 13%
Customization concerns: 1.5%

Scenario 1: Diverse — 12% / 88%
Scenario 2: Restricted — 12% / 33% / 55%

1 Goldman Sachs (2023) *Upgrading our Longer-Run Global Growth Forecasts to Reflect impact of Generative AI*, estimate 'full adoption', or the saturation level, of generative AI is between 80-95% of businesses adopting generative AI. We take the midpoint (87.5%) as our estimate, and validate against the saturation rate of other technologies, including household internet usage, cloud usage and digitized information
2 Predibase (2023) *Large Language Models in Production*.
Source: Mandala analysis.

# We then modeled likely adoption curves for generative AI across the two scenarios

Adoption curves for generative AI scenarios illustrate how businesses are expected to reach full adoption over time.

The availability of open foundation models (and the resulting transparency, competition and innovation) will increase the speed and scale of generative AI adoption compared to the restricted generative AI ecosystem. This pattern can be modeled as an 'S-Curve' with the following equation:

$$P(t) = \frac{L}{1 + e^{-k(t-t_o)}}$$

Where:
- $P(t)$ is the predicted adoption rate at time t
- $L$ is the maximum value
- $k$ is the growth rate
- $t_o$ is the inflection point
- $e$ is the natural based logarithm

**Diverse scenario adoption curve**

| Input | Value | Source |
|-------|-------|--------|
| $L$ | 87.5% | See previous slide |
| $P(2024)$ | 5.4% | US Census, Business trends and outlook survey[1] |
| $t_o$ | 2032 | Goldman Sachs (2023)[2] |
| $k$ | 0.34 | Solve using equation |

**Restricted scenario adoption curve**

| Input | Value | Source |
|-------|-------|--------|
| $L$ | 55.0% | See previous slide |
| $P(2024)$ | 5.4% | US Census, Business trends and outlook survey[1] |
| $t_o$ | 2032 | Goldman Sachs (2023)[2] |
| $k$ | 0.28 | Solve using equation |

**Exhibit A2: Business adoption of foundation models by scenario**
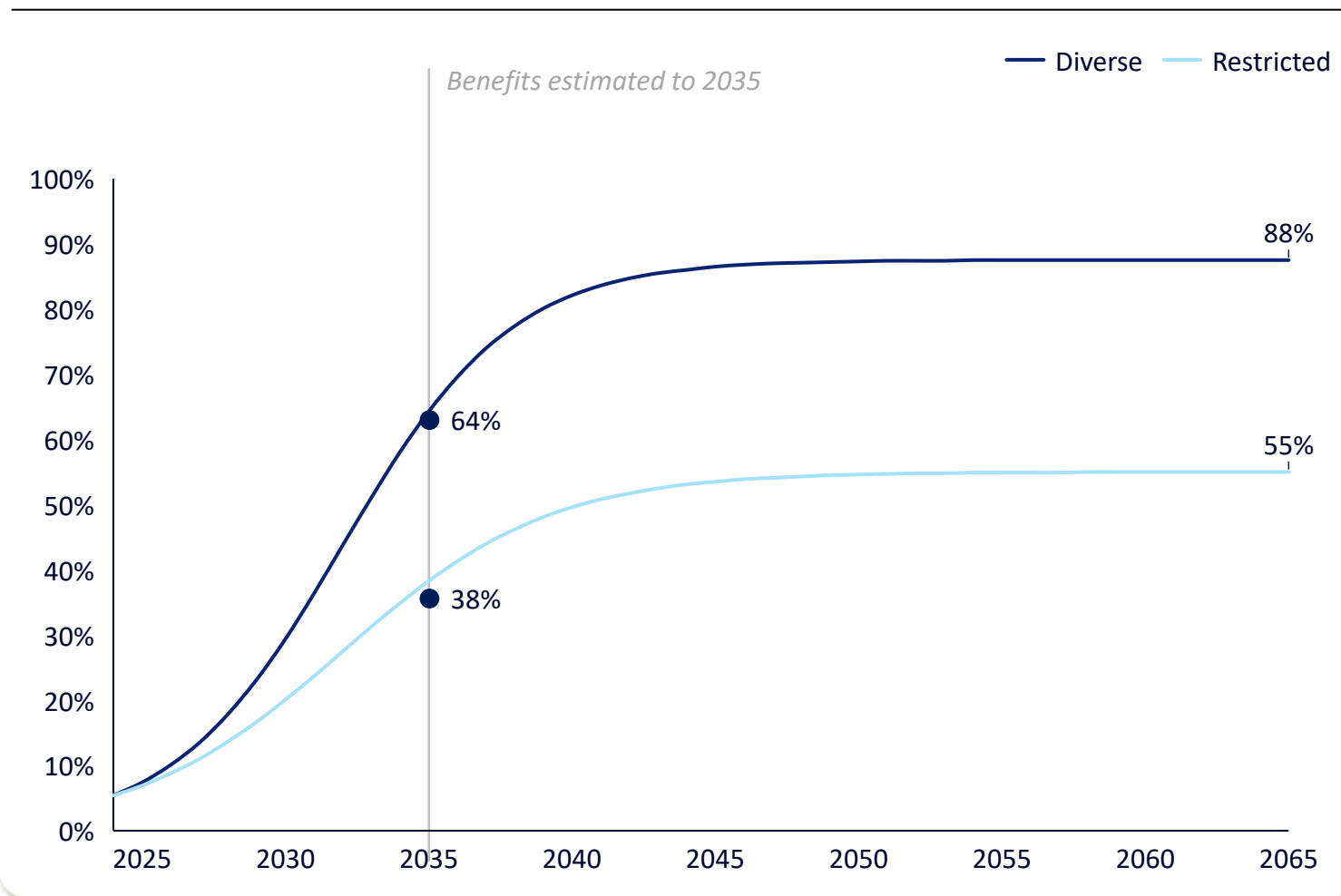
*% of businesses, 2025 – 2065*



1. US Census Bureau (2024) *Business Trends and Outlook Survey* asks "In the last two weeks, did this business use Artificial Intelligence (AI) in producing goods or services? (Examples of AI: machine learning, natural language processing, virtual agents, voice recognition, etc)
2 Goldman Sachs (2023) *Upgrading our Longer-Run Global Growth Forecasts to Reflect impact of Generative AI*;
Source: Mandala analysis.

# To estimate the business benefits of OFMs, we modeled the impact across two scenarios: a diverse generative AI ecosystem vs a restricted ecosystem
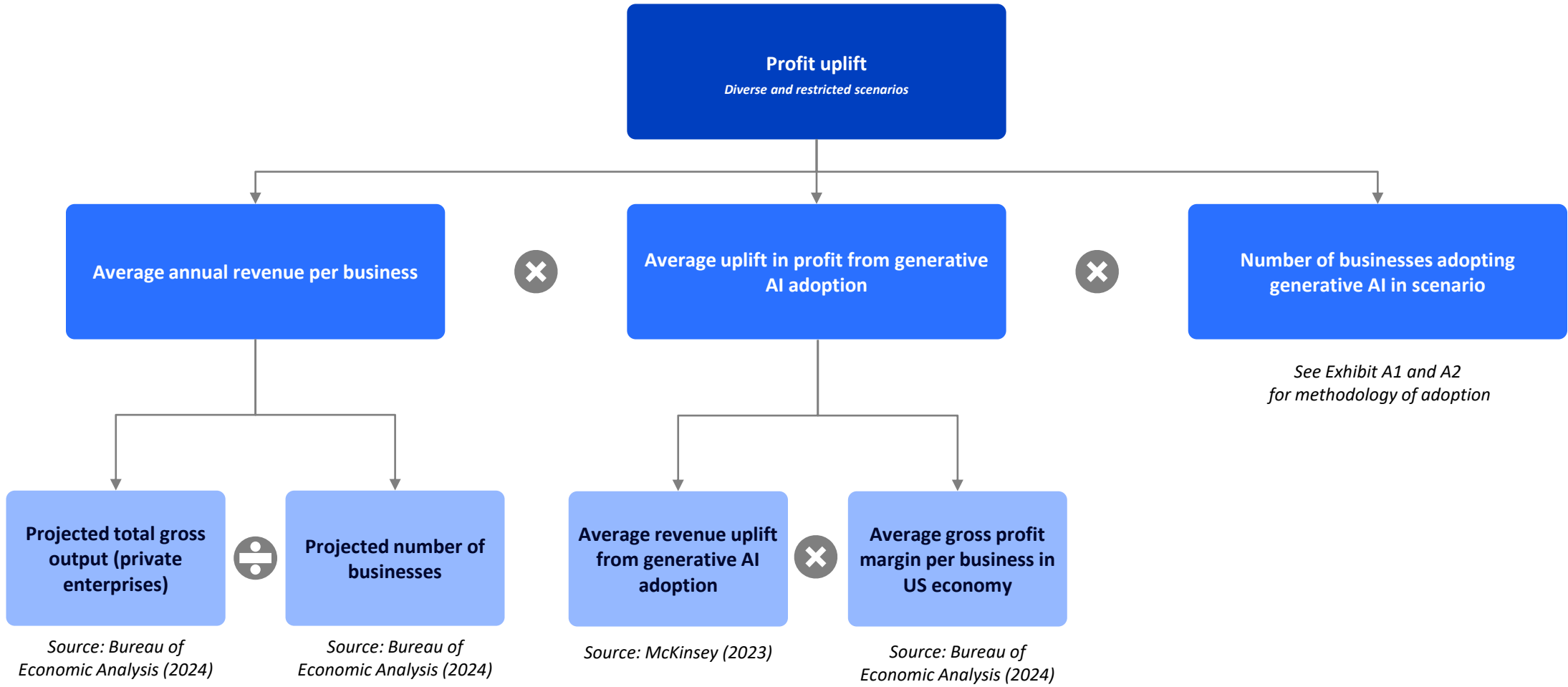
**Exhibit A3: Method for quantifying the benefits of open foundation models to businesses**

# Method for calculating profit uplift

Exhibit A4: Methodology to derive revenue uplift benefits



**Profit uplift**
*Diverse and restricted scenarios*

**Average annual revenue per business** ✕ **Average uplift in profit from generative AI adoption** ✕ **Number of businesses adopting generative AI in scenario**

*See Exhibit A1 and A2 for methodology of adoption*

**Projected total gross output (private enterprises)** ÷ **Projected number of businesses**

**Average revenue uplift from generative AI adoption** ✕ **Average gross profit margin per business in US economy**

*Source: Bureau of Economic Analysis (2024)*

*Source: Bureau of Economic Analysis (2024)*

*Source: McKinsey (2023)*

*Source: Bureau of Economic Analysis (2024)*

# Method for calculating operational efficiency

**Exhibit A5: Methodology to derive operational efficiency benefits**



**Operational efficiency**
*Diverse and restricted scenarios*

**Total private industry costs** — **Average decrease in costs from generative AI adoption per business** ✕ **Number of businesses adopting generative AI in scenario**

*See Exhibit A1 and A2 for methodology of adoption*

**Total gross output (private industries)** — **Total gross operating surplus (private industries)**

*Source: Bureau of Economic Analysis (2024)*

*Source: Bureau of Economic Analysis (2024)*

**Average costs per business**

*Source: Bureau of Economic Analysis (2024)*

**% decrease in costs from Gen AI adoption**

*Source: McKinsey (2023)*

Source: Mandala analysis.

# Method for calculating rent reductions

Exhibit A6: Methodology to derive operational efficiency benefits



Source: Harvard Business Review (2024)

Source: Deloitte (2023)

Source: Deloitte (2023)

Source: Bureau of Economic Analysis (2024)
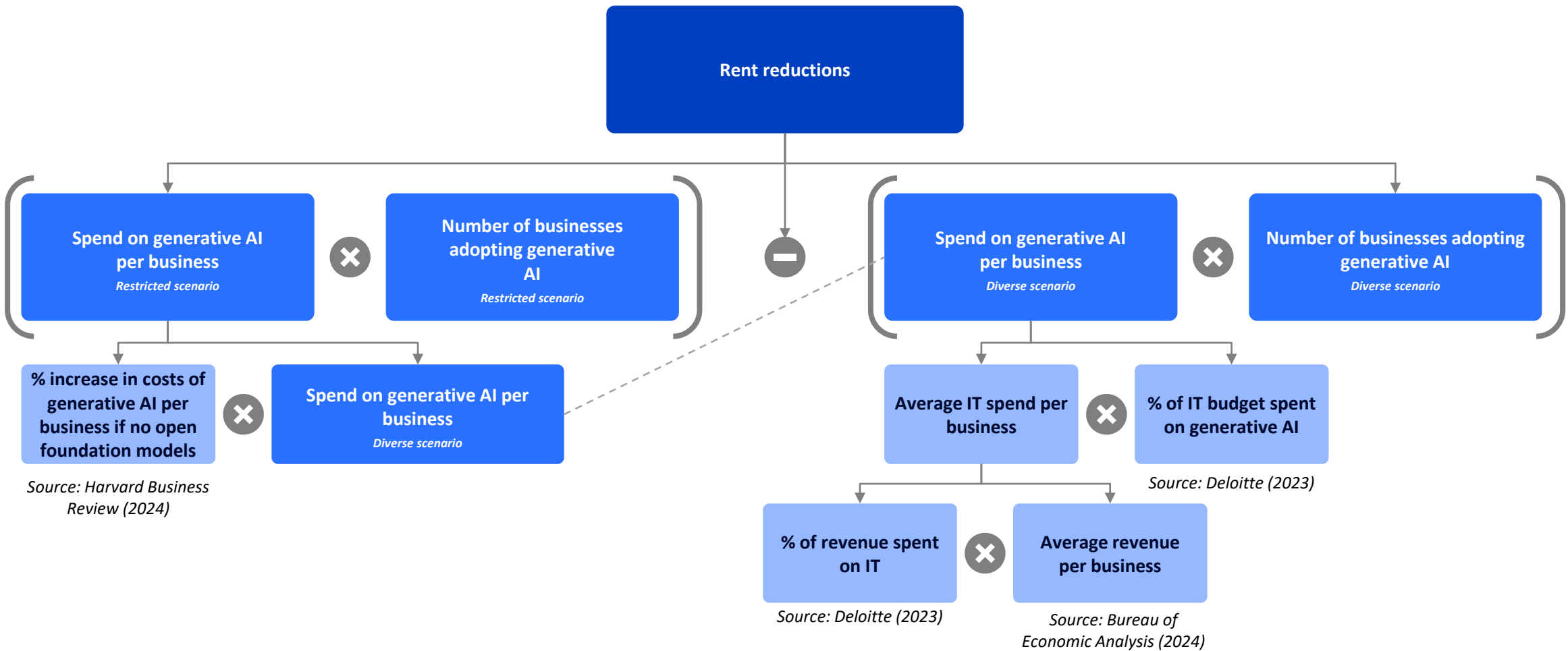
# Modelling assumptions (I/IV)

**Exhibit A7: Modelling assumptions**

| Category | Assumption | Value | Source | Notes |
|---|---|---|---|---|
| **General** | Discount rate | 2% | The White House (2024) *Valuing the Future: Revision of the Social Discount Rate Means Appropriately Assessing Benefits and Costs* | |
| | Inflation rate | 2.5% | Bureau of Economic Analysis (2024) *GDP Price Deflator* | CAGR from 2013-2022 (last 10 years of data) |
| | Annual growth rate of the number of businesses in base case, 2025-2035 | 1% | US Census Bureau (2024) *Statistics of U.S businesses* | CAGR from 2012-2021 (last 10 years of data) |
| **Adoption** | Number of businesses using generative AI to produce goods and services currently | 5.40% | US Census Bureau (2024) *Business Trends and Outlook Survey* | US Census Bureau (2024) *Business Trends and Outlook Survey* asks "In the last two weeks, did this business use Artificial Intelligence (AI) in producing goods or services? (Examples of AI: machine learning, natural language processing, virtual agents, voice recognition, etc) |
| | Years along adoption curve in 2024 | 6 years | Calculation | Assume the starting point of the adoption curve off LLMs in 2018, in line with the release of BERT and developments in transformers |
| | Midpoint of adoption | 2032 | Goldman Sachs (2023) *Upgrading our Longer-Run Global Growth Forecasts to Reflect impact of Generative AI* | |
| | Maximum value of business adoption in diversified scenario | 87.5% | Goldman Sachs (2023) *Upgrading our Longer-Run Global Growth Forecasts to Reflect impact of Generative AI* | Goldman Sachs estimate 'full adoption', or the saturation level, of generative AI is between 80-95% of businesses adopting generative AI. We take the midpoint (87.5%) as our estimate, and validate against the saturation rate of other technologies, including household internet usage, cloud usage and digitized information |

# Modelling assumptions (II/IV)

**Exhibit A8: Modelling assumptions**

| Category | Assumption | Value | Source | Notes |
|---|---|---|---|---|
| **Adoption** | Maximum value of business adoption in restricted scenario | 55.5% | Calculation:<br>• Max adoption in restricted scenario = Max adoption in diverse scenario – % businesses that do not adopt due to concerns with closed foundation models<br><br>• % of businesses that do not adopt due to concerns with foundation models = % of businesses with data security concerns + % of businesses with cost concerns + % of businesses with customisation concerns | In the restricted scenario, there is a proportion of businesses who do not adopt generative AI due to concerns with closed foundation models (and who otherwise would adopt if open foundation models were available).<br><br>To estimate this proportion, we use survey results reported in Predibase (2023) *Language Models in Production,* about businesses' concerns with commercial large language models. See rows below. |
| | % of businesses with data concerns about closed foundation models in 2035 | 18% | Predibase (2023) *Language Models in Production* | Predibase (2023) reports 36% of survey respondents do not large language models from commercial vendors, due to concerns with data security.<br><br>By 2035, we assume this proportion reduces to 18%, as vendors address data concerns with improvements to foundation models. This assumption is guided by improvements in cloud computing and improved attitudes towards cloud security. |
| | % of businesses with cost concerns about closed foundation models in 2035 | 13% | Predibase (2023) *Language Models in Production* | Predibase (2023) reports 13% of survey respondents do not large language models from commercial vendors, due to concerns with cost.<br><br>By 2035, we assume this proportion remains constant at 13%. This is because the cost of adopting foundation models from commercial vendors in the restricted scenario is likely to remain a barrier to entry, as modeled in our 'rent reduction' modelling. |
| | % of businesses with customisation concerns about closed foundation models in 2035 | 1.5% | Predibase (2023) *Language Models in Production* | Predibase (2023) reports 3% of survey respondents do not large language models from commercial vendors, due to concerns with not being able to customize models to a sufficient level.<br><br>By 2035, we assume this proportion reduces to 1.5%, as vendors address such with improvements to foundation models. |

# Modelling assumptions (III/IV)

**Exhibit A9: Modelling assumptions**

| Category | Assumption | Value | Source | Notes |
|---|---|---|---|---|
| **Profit uplift** | Annual growth rate of total output (private industries), 2025-2035 | 6% | Bureau of Economic Analysis(2024) *Gross Output by Industry* | CAGR from 2018-2022 (last 5 years of data of available) |
| | Average increase in business revenue per business from adopting generative AI (percentage points) | 4.8% | McKinsey (2023) *The state of AI in 2023—Generative AI's breakout year* | Weighted average revenue increase of businesses using generative AI, across industries |
| | Average Gross Profit Margin of US Firms | 28.2% | Bureau of Economic Analysis (2024) *Components of Value Added by Industry*<br><br>Bureau of Economic Analysis (2024) *Intermediate Inputs by Industry* | Average of last 5 years |
| **Operational efficiency** | Annual growth rate of operating surplus (private industries), 2025-2035 | 6% | Bureau of Economic Analysis (2024) *Components of Value Added by Industry* | CAGR from 2018-2022 (last 5 years of data of available)<br><br>Gross operating surplus was used to calculated total businesses costs in economy, with the following equation:<br><br>▪ Total costs (private industries) = Total output (private industries) – Gross operating surplus (private industries) |
| | Average decrease in business costs per business from adopting generative AI (percentage points) | 8.7% | McKinsey (2023) *The state of AI in 2023—Generative AI's breakout year* | Weighted average cost decrease of businesses using generative AI, across industries |

# Modelling assumptions (IV/IV)

**Exhibit A10: Modelling assumptions**

| Category | Assumption | Value | Source | Notes |
|---|---|---|---|---|
| **Rent reductions** | Increase in spend on generative AI if open foundation models did not exist | 3.5 times diverse scenario | Harvard Business School (2024) *Value of Open Source Software* | Estimated spend on software if open source software did not exist |
| | Business spend on generative AI (percent of IT budget) | 3-15% per year, increasing | Bloomberg Intelligence (2023) *Generative AI to Become a $1.3 Trillion Market by 2032* | Estimated spend per year<br><br>In both scenarios we assume individual business expenditure on generative AI will grow to 15% of their IT budget by 2035 (growing from 5% in 2025) |
| | Business IT budget (percent of revenue) | 6-7% per year, increasing | Deloitte (2023) *Global Technology Leadership Study* | Estimated spend per year<br><br>In both scenarios, we assume individual business expenditure on IT grows to 7% of revenue by 2035 (growing from 6% in 2025) |
| | Business IT budget, growth rate | 2% | Deloitte (2023) *Global Technology Leadership Study* | CAGR calculated on IT spend per year from 2016-2023 |

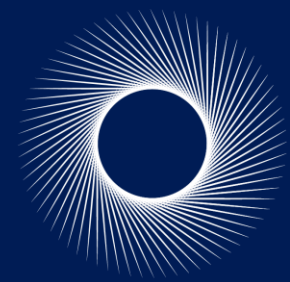| 4 | Appendix |
| A | Methodology |
| **B** | **References** |

# References (I/II)

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