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# A PRIMER ON GENERATIVE AI AND VALUATION CONSIDERATIONS FOR INSOLVENCY PROFESSIONALS

DR. SHASTRI SANDY  
RAFAEL KLOTZ  
ETHAN MOORE



**INSOL International, 29-30 Ely Place, London, EC1N 6TD**  
**Tel: +44 (0) 20 7248 3333**

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INSOL International is pleased to present our members with this new technical paper, "A Primer on Generative AI and Valuation Considerations for Insolvency Professionals", written by Dr Shastri Sandy (Principal), Rafael Klotz (Principal) and Ethan Moore (Senior Litigation Specialist) of The Brattle Group.

The paper provides a timely and insightful analysis of the development and key applications of generative artificial intelligence (AI), and the economic potential of generative AI harvested by so-called "Core Gen AI" companies. The paper points out that, in light of past disruptive technologies' "booms and busts", Core Gen AI companies may also be susceptible to insolvency events in the future. In that context, the paper seeks to provide practitioners with an understanding of Core Gen AI companies and the factors to consider in their treatment in insolvency and insolvency proceedings, including the challenges and approaches to valuing these entities.

At a time of rapid technological advancement and evolving insolvency and restructuring laws designed to keep pace with this trend, the paper is an important resource for INSOL's members. We sincerely thank the authors for their time and expertise in preparing the paper.

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<sup>1</sup> The authors are extremely grateful to Dr Bin Zhou (Principal) and Matthew MacKenzie (Manager of Data Engineering) of The Brattle Group for providing peer review and critical feedback on this technical paper. Their insights contributed meaningfully to the rigour and clarity of the final work.

## 1. Introduction

Generative artificial intelligence (AI) utilises machine-learning models to train on existing works, create a complex schema of patterns in these works and their relation to each other, and then respond to user prompts to create content based on what it “learned” in its training on existing content.

The economic potential of generative AI is vast. So-called “Core Gen AI” companies – startup firms, as well as internal divisions of some of the largest technology companies in the world – develop and commercialise generative AI systems capable of creating new content. These firms, or internal divisions, build foundation or application-level models and package them into products for use by third-party customers, either via a platform or Application Programming Interface (API). The core business model of these generative AI firms centres on monetising generative systems through direct sales, licensing, subscriptions or usage-based fees.

Historically, many emergent technologies eventually result in a wave of business failures, which could lead to insolvencies. The late 1990s saw the “dot-com bubble,” and the 2000s saw the satellite insolvencies (with another round in the 2020s, this time affecting satellite firms looking to capitalise on data and internet services). Crypto-related insolvencies are the most recent examples. The unexpected generative AI capabilities of the Chinese startup DeepSeek and the immediate volatility it caused on global markets further suggest that it is only a matter of time before the insolvency industry and courts are required to address the complex issues relating to the failure and insolvency of Core Gen AI companies.

Economic risks to these companies include legal challenges regarding authorship, ownership, biases in generated output<sup>2</sup> and copyright infringement.<sup>3</sup> For example, many generative AI models are alleged to have been trained on copyrighted works, leading to a series of ongoing copyright infringement suits against generative AI firms.<sup>4</sup> If the courts find against the generative AI firms, the statutory damages could result in these firms becoming insolvent and, as a result, being compelled to restructure or liquidate.<sup>5</sup> Bankruptcy or insolvency courts, as the case may be, will then be required to scrutinise generative AI firms and asset values in the context of each jurisdiction’s specific procedures. For example, adequate protection disputes, plan confirmation issues (e.g. cramdown, the best interests of creditors test) and the allowance of claims in US Chapter 11 cases, relative alternative arguments in UK insolvencies, and in general to assess the impact of ongoing copyright infringement litigation in considering the viability of any proposed restructuring or Chapter 11 plan, to highlight just a few likely areas that will put these concepts to the test before the courts.

Consequently, it is important for insolvency practitioners to develop an understanding of Core Gen AI companies and the factors to consider in their treatment in insolvency and bankruptcy or insolvency proceedings.

The first part of this technical paper will summarise AI technology and discuss the potential of speculative valuations of generative AI. The second part of the paper will address the challenges and approaches in valuing Core Gen AI companies in a restructuring and insolvency context.

## 2. Generative AI

### 2.1 Background

Generative AI, once the realm of science fiction, has been rapidly incorporated everywhere,<sup>6</sup> from our workplaces<sup>7</sup> to our schools.<sup>8</sup> The business impact is clear: generative AI can perform complex tasks – such as creating human-like text, images, videos and even decision-making processes – at speeds far beyond human capability. Traditional AI systems often rely on predefined rules or are trained to perform specific tasks such as classification.<sup>9</sup> Generative AI, by contrast, is designed to model patterns in large datasets and use those patterns to generate new outputs that resemble the training data.<sup>10</sup> Given generative AI’s potential to transform knowledge works in a similar manner as automation transformed manufacturing, its rapid business adoption is unsurprising.

Despite the potential economic benefits of hi-tech innovations of broad application, historically many emergent

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- 2 Christine Polek and Shastri Sandy, “The Disparate Impact of Artificial Intelligence and Machine Learning” (2023) 21 *Colorado Technology Law Journal* 85, 96.
  - 3 Francelina Perdomo Klukosky and Matthew D. Kohel, “An Update on The State of Play With Generative Artificial Intelligence and Intellectual Property Issues,” *Intellectual Property Litigation* (2024) 34(1). See also “An End-of-Year Update to the Current State of AI Related Copyright Litigation,” *Ropes & Gray*, 17 December 2024, <https://www.ropesgray.com/en/insights/alerts/2024/12/an-end-of-year-update-to-the-current-state-of-ai-related-copyright-litigation>. Also note Katie Robinson, “8 Daily Newspapers Sue OpenAI and Microsoft Over A.I.” *New York Times*, 30 April 2024, <https://www.nytimes.com/2024/04/30/business/media/newspapers-sued-microsoft-openai.html>.
  - 4 “An End-of-Year Update to the Current State of AI Related Copyright Litigation,” *Ropes & Gray*, 17 December 2024, <https://www.ropesgray.com/en/insights/alerts/2024/12/an-end-of-year-update-to-the-current-state-of-ai-related-copyright-litigation>. See also Katie Robinson, “8 Daily Newspapers Sue OpenAI and Microsoft Over A.I.” *New York Times*, 30 April 2024, <https://www.nytimes.com/2024/04/30/business/media/newspapers-sued-microsoft-openai.html>.
  - 5 For example, an ongoing class action suit against GitHub seeks US \$9 billion in statutory damages related to alleged copyright violations in training their Copilot generative AI platform. Complaint, *Doe v. GitHub, Inc.*, No. 4:22-cv-06823 (N.D. Cal. filed 3 November 2022), [https://githubcopilotlitigation.com/pdf/06823/1-0-github-complaint.pdf?utm\\_source=chatgpt.com](https://githubcopilotlitigation.com/pdf/06823/1-0-github-complaint.pdf?utm_source=chatgpt.com).
  - 6 Matt O’Brien and Sarah Parvini, “In 2024, Artificial Intelligence Was All About Putting AI Tools to Work,” *AP*, 30 December 2024, <https://apnews.com/article/ai-artificial-intelligence-0b6ab89193265c3f60f382bae9bbabc9>.
  - 7 Alexander Bick, Adam Blandin, and David Edming, “The Rapid Adoption of Generative AI,” *Centre for Economic and Policy Research*, 20 October 2024, <https://cepr.org/voxeu/columns/rapid-adoption-generative-ai>.
  - 8 Zara Adams, “Classrooms are Adapting to The Use of Artificial Intelligence” (2025) 56(1) *Monitor On Psychology*, 70, <https://www.apa.org/monitor/2025/01/trends-classrooms-artificial-intelligence>.
  - 9 Adam Zewe, “Explained: Generative AI,” *MIT News*, 9 November 2023, <https://news.mit.edu/2023/explained-generative-ai-1109>.
  - 10 *Ibid.*

technologies have experienced boom and bust cycles. Examples include Global Crossing and WorldCom from the telecom bubble<sup>11</sup> (1996–2002); Pets.com, Webvan, 360networks and eToys from the dot-com bubble<sup>12</sup> (late 1990s–early 2000s); and Celsius Network, FTX, BlockFi and Terraform Labs from the crypto bubble<sup>13</sup> (2022–present). Disruptive technologies – as those from the telecom and dot-com bubbles were, and crypto continues to be – also impact the survival of legacy firms that are not adaptable to new market entrants.<sup>14</sup> Conversely, many firms – such as Amazon, Google, T-Mobile and Verizon – not only survived this period but emerged from them as valuable businesses.<sup>15</sup>

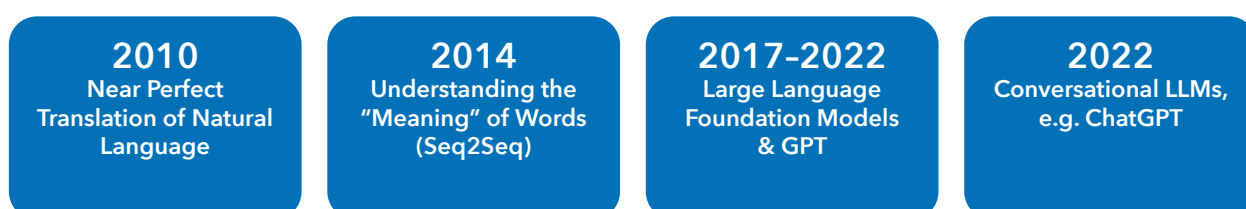
Some practitioners posit that generative AI is already in the midst of a tech bubble,<sup>16</sup> while others downplay the speed of innovation and the ultimate scope of the technology's impact on the global economy.<sup>17</sup> The investment buttressing many of the leading AI platforms – such as Gemini, Copilot and Meta AI – is different from that of prior emerging technologies. These investments are funded by large, entrenched tech companies – such as Google, Microsoft and Meta respectively – as strategic investments rather than financial.<sup>18</sup> We also note that venture capital is being directed at generative AI startups at a historic rate.<sup>19</sup>

## 2.2

### How generative AI functions

Advancements in deep learning<sup>20</sup> and large language models (LLMs)<sup>21</sup> have led to the widespread adoption of generative AI. Specifically, recent milestones in language processing and “foundation” LLMs have enabled an influx of novel consumer-facing products (see below in Figure 1). Improvements in deep learning techniques, from the early 2010s to present, have enabled substantial progress in natural language processing.<sup>22</sup>

**Figure 1: Key milestones in development of generative AI products<sup>23</sup>**



The term “foundation model” refers to a large-scale, general-purpose AI system (e.g. GPT-4) trained on broad datasets capable of supporting a wide range of tasks.<sup>24</sup> These models are typically developed by firms with substantial computational and data resources. Applications such as ChatGPT are built on top of foundation models, incorporating user interfaces and alignment mechanisms that guide the model's behaviour for specific use cases. Foundation models can also be adapted by third parties at the application level, tailored to particular tasks, domains or client needs such as generating marketing content, assisting with software development or analysing legal documents.<sup>25</sup>

- 11 Elise A. Couper, John P. Hejkal, and Alexander L. Wolman, “Boom and Bust in Telecommunications,” Federal Reserve Bank of Richmond, *Economic Quarterly* 89(4) (Fall 2003), [https://www.richmondfed.org/~media/richmondfedorg/publications/research/economic\\_quarterly/2003/fall/pdf/wolman.pdf](https://www.richmondfed.org/~media/richmondfedorg/publications/research/economic_quarterly/2003/fall/pdf/wolman.pdf).
- 12 John D. Penn, “Dot.Bombs: The Internet's New Growth Sector” (2001) 20(5) *American Bankruptcy Institute Journal* 20(5), 28.
- 13 Julian Mark, “The Companies That Helped Create 2022's ‘Crypto Winter,’” *Washington Post*, 13 December 2022, <https://www.washingtonpost.com/business/2022/12/05/crypto-ftx-collapse-bankruptcy-companies/>.
- 14 See for example the 2013 insolvency of Blockbuster in the face of online streaming video, and the 2012 insolvency of Kodak in the case of digital photography. Richard A. Gershon, Ph.D., “Innovation Failure: A Case Study Analysis of Eastman Kodak and Blockbuster Inc” in *Media Management and Economics Research in A Transmedia Environment*, ed. Alan B. Albarran (New York, Routledge, 2013), 46–69.
- 15 For example, as of the time this article was issued Coinbase and a few other cryptocurrency businesses appear to have weathered that industry's crash and seen valuations bounce back. See George Glover, “Coinbase Stock Soars. What's Behind the Rally in Crypto Shares,” *Barron's*, 11 November 2024, <https://www.barrons.com/articles/coinbase-stock-price-crypto-bitcoin-trump-0e1029e8>.
- 16 Luciano Floridi, “Why the AI Hype is Another Tech Bubble” (2024) 37(128) *Philosophy & Technology*, <https://link.springer.com/article/10.1007/s13347-024-00817-w>: “... there is an argument to be made that the current AI Hype Cycle shares significant similarities with previous tech bubbles, exhibiting the typical characteristics of a tech bubble (Widder and Hicks 2024). The rapid advancements in AI, particularly in machine learning, deep learning, and LLMs (or, to be more precise, foundation models), have led to a surge of excitement, investment, and media attention, mutually reinforcing each other and reminiscent of previous tech bubbles, especially the Dot-Com Bubble (Dobre et al., 2020; Krauskopf, 2024/07/02).” See also David Gray Widder and Mar Hicks, “Watching the Generative AI Hype Bubble Deflate,” *Harvard Kennedy School*, 20 November 2024, <https://ash.harvard.edu/resources/watching-the-generative-ai-hype-bubble-deflate/>.
- 17 Michelle Celarier, “Goldman Sachs Throws Cold Water on AI Mania,” *Institutional Investor*, 15 July 2024, <https://www.institutionalinvestor.com/article/2di0s1e6m7h197mfh6fb4/portfolio/goldman-sachs-throws-cold-water-on-ai-mania>.
- 18 Gerrit De Vynck and Naomi Nix, “Big Tech Keeps Spending Billions on AI. There's No End in Sight,” *Washington Post*, 25 April 2024, <https://www.washingtonpost.com/technology/2024/04/25/microsoft-google-ai-investment-profit-facebook-meta/>.
- 19 Rebecca Szkutak, “Here's the full list of 44 US AI startups that have raised \$100M or more in 2024,” *TechCrunch*, 15 November 2024, <https://techcrunch.com/2024/11/15/heres-the-full-list-of-44-us-ai-startups-that-have-raised-100m-or-more-in-2024/>.
- 20 I.D. Mienye and T.G. Swart, “A Comprehensive Review of Deep Learning: Architectures, Recent Advances, and Applications” (2024) 15(12) *Information*, <https://doi.org/10.3390/info15120755>; “A Short History of AI,” *The Economist*, 20 July 2024, <https://www.economist.com/schools-brief/2024/07/16/a-short-history-of-ai>.
- 21 Wang, Zichong et al., “History, Development, and Principles of Large Language Models: An Introductory Survey,” *AI and Ethics* (October 2024), Working Paper available at: <https://arxiv.org/pdf/2402.06853>.
- 22 “Large, Creative AI Models Will Transform Lives and Labour Markets,” *The Economist*, 22 April 2023, <https://www.economist.com/interactive/science-and-technology/2023/04/22/large-creative-ai-models-will-transform-how-we-live-and-work>.
- 23 I.D. Mienye and T.G. Swart, “A Comprehensive Review of Deep Learning: Architectures, Recent Advances, and Applications” (2024) 15(12) *Information*, <https://doi.org/10.3390/info15120755>; Wang, Zichong et al., “History, Development, and Principles of Large Language Models: An Introductory Survey,” *AI and Ethics* (October 2024), Working Paper available at: <https://arxiv.org/pdf/2402.06853>; “A Short History of AI,” *The Economist*, 20 July 2024, <https://www.economist.com/schools-brief/2024/07/16/a-short-history-of-ai>; “Introducing ChatGPT,” OpenAI, 30 November 2022, <https://openai.com/index/chatgpt/>; “Seq2seq,” *Wikipedia*, <https://en.wikipedia.org/wiki/Seq2seq>.
- 24 Schneider, Johannes, Christian Meske and Pauline Kuss, “Foundation Models: A New Paradigm for Artificial Intelligence,” (2024) 66(2) *Bus Inf Syst Eng*, 221–231, <https://link.springer.com/content/pdf/10.1007/s12599-024-00851-0.pdf>.
- 25 “How Businesses Are Actually Using Generative AI,” *The Economist*, 29 February 2024, <https://www.economist.com/business/2024/02/29/how-businesses-are-actually-using-generative-ai>.

The development of generative AI models involves two main phases: training and generation.<sup>26</sup>

LLMs are first trained on vast datasets to capture the statistical structure and relationships within text, images or other inputs. This training phase is computationally intensive and enables the model to assign weights across complex data networks, allowing it to generate coherent outputs.

This process is modelled after the function of the human biological brain, wherein a trigger in a given neuron activates or turns off activity in connected neurons, creating a “neural network”. Similarly, LLMs create deep learning neural networks that map complex relationships between datapoints – the text, images, or video they are trained on. The models then assign weights to the datapoints based on the strength of their connections. Following a 2017 technology advancement – the use of “transformers” in the LLMs<sup>27</sup> – these relationships can be mapped across the billions of training datapoints without the need to give specific explicit instructions. These transformers appear in the name ChatGPT, whose LLM is an example of such a GPT model, or “generative pre-trained transformer” model. The “Chat” component of ChatGPT reflects that users interact with the GPT model through a chatbot.

In the second phase – the generation phase – the assigned weighted associations enable the model to generate outputs (such as new text, video or images) in response to user queries. The model’s response represents the learned relationship between the trained data and the produced content, and can even mimic the trained content in style and structure.<sup>28</sup> Depending on the model’s complexity and purpose, as well as the data it was trained on, generative AI can produce a variety of outputs, from answering coherent text responses (such as assisting in legal briefing<sup>29</sup>) to generating functional code or creating images, video or audio content.<sup>30</sup>

As an illustrative example of how generative AI works, consider ChatGPT. Reported as “the fastest-growing consumer application in history,”<sup>31</sup> ChatGPT has attracted new users across economic sectors.<sup>32</sup> ChatGPT is an artificial intelligence chatbot,<sup>33</sup> developed by OpenAI, that can generate complex responses – phrased in natural human language, in both English and non-English<sup>34</sup> – to user requests. ChatGPT is just the foremost of an expanding landscape of chatbots. Competitor generative AI startups are raising billions in funding,<sup>35</sup> and entrenched technology firms have also been eager to fund their own: Google with Gemini,<sup>36</sup> Meta with MetaAI<sup>37</sup> and Microsoft with Copilot,<sup>38</sup> for example.

A user could prompt ChatGPT with the following instruction: “Write a book blurb in the style of Stephen King similar to *The Stand*, King’s 1978 dark fantasy epic. ChatGPT leverages its training on the author’s work and / or discussions of the works to create the following three-paragraph synopsis:<sup>39</sup>

In the wake of a catastrophic pandemic that ravages the world, humanity is left teetering on the brink of extinction. Amidst the chaos and despair, a disparate group of survivors emerges, each grappling with their own inner demons as they navigate the desolate landscape of a society on the brink of collapse.

But as they struggle to forge new alliances and confront the horrors of their shattered world, they soon realise that the greatest threat may not lie in the remnants of civilisation, but in the darkness that lurks within themselves. As tensions rise and loyalties are tested, they must confront the ultimate question: what does it mean to be human in a world that has lost all semblance of humanity?

From the master of psychological horror comes a gripping tale of survival, redemption, and the enduring power of hope in the face of unimaginable adversity. With its haunting prose and unforgettable characters, “Echoes of the Plague” will leave you breathless until the very last page, and remind you that even in the darkest of times, there is always a glimmer of light waiting to be found.

Created by generative AI, the blurb above – for the “new” title *Echoes of the Plague* – reads similarly to how one would summarise King’s novel *The Stand*, published in 1978 (and still under copyright).<sup>40</sup>

26 Going in depth on the technical details exceeds the scope of this paper. Wu, et al. (2023) provide an in-depth case study of ChatGPT over its iterations of these phases, covering foundational technologies, existential challenges and anticipated trends. Tianyu Wu et al., “A Brief Overview of ChatGPT: The History, Status Quo and Potential Future Development” (2023) 10(3) *IEEE/CAA Journal of Automatica Sinica*, 1122-1136.

27 Cole Stryker and David Bergmann, “What is a Transformer Model?” *IBM*, 28 March 2025, <https://www.ibm.com/think/topics/transformer-model>.

28 Ian Goodfellow, Yoshua Bengio and Aaron Courville, *Deep Learning* (MIT Press, Cambridge, 2017).

29 Kathryn C. Nadro, “Generative AI: Legal Ethics and Best Practices,” *ABI Journal*, December 2024, 83-85.

30 Elysee Bell, “Generative AI: How It Works and Recent Transformative Developments,” *Investopedia*, 7 January 2025, <https://www.investopedia.com/generative-ai-7497939>.

31 Krystal Hu, “ChatGPT Sets Record for Fastest-Growing User Base – Analyst Note,” *Reuters*, 2 February 2023, <https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/>.

32 Anders Humlum and Emilie Vestergaard, “The Adoption of ChatGPT,” University of Chicago Becker Friedman Institute for Economics, 24 April 2024, <https://bfi.uchicago.edu/insights/the-adoption-of-chatgpt>.

33 “What is a Chatbot?” *IBM*, <https://www.ibm.com/think/topics/chatbots>.

34 “How to Change Your Language Setting in ChatGPT,” OpenAI, <https://help.openai.com/en/articles/8357869-how-to-change-your-language-setting-in-chatgpt>.

35 Ryan Browne, “Generative AI Startups Get 40% of All VC Investment in Cloud Amid ChatGPT Buzz,” *CNBC*, 16 October 2024, <https://www.cnbc.com/2024/10/16/generative-ai-startups-get-40percent-of-all-vc-investment-in-cloud-accel.html>.

36 “Introducing Gemini 2.0: Our New AI Model for the Agentic Era,” Google, 11 December 2024, <https://blog.google/technology/google-deepmind/google-gemini-ai-update-december-2024/#ceo-message>.

37 “Meta’s AI Products Just Got Smarter and More Useful,” Meta, 25 September 2024, <https://about.fb.com/news/2024/09/metass-ai-product-news-connect/>.

38 “An AI Companion for Everyone,” Microsoft, 1 October 2024, <https://blogs.microsoft.com/blog/2024/10/01/an-ai-companion-for-everyone/>.

39 ChatGPT 4o, OpenAI, 27 April 2025, <https://chat.openai.com/share/c957604f-879d-44ac-bca2-06412ae897a8>.

40 “Works/Novels: The Stand,” Stephenking.com, <https://stephenking.com/works/novel/stand.html>.

One could similarly generate a summary of major events in a particular industry, or an outline of a legal briefing based on case documents.

For example, a user could prompt ChatGPT with the following request: “In one paragraph, summarise the impact of Part 26A of the Companies Act 2006 in the U.K. on European insolvency proceedings.”

To which ChatGPT outputs:

Part 26A of the Companies Act 2006, introduced in the UK through the Corporate Insolvency and Governance Act 2020, established a new restructuring plan regime that mirrors aspects of U.S. Chapter 11 bankruptcy. Its introduction has had significant implications for European insolvency proceedings, particularly post-Brexit. Although the UK is no longer part of the EU's insolvency recognition framework, English courts have continued to assert jurisdiction over European companies through sufficient connection tests, such as the presence of English law-governed debt. This has led to UK restructuring plans being used by European firms to bind dissenting creditors across jurisdictions, raising questions about cross-border enforceability and forum shopping, and prompting increasing scrutiny from EU courts regarding recognition of such plans.

In this way, generative AI chatbots like ChatGPT can also be used for research and has replaced search engines for some users.<sup>41</sup>

Just as models are trained on – and can output – text as above, other models are focused on images. While in the case of text, the model is predictive of what words go together in response to a prompt, in the case of images the models are predictive of what pixels go together.<sup>42</sup> One of the largest public training datasets, LAION-5B, contains 5.85 billion images.<sup>43</sup> Trained on such a substantial volume of datasets, image-based generative AI platforms can take user text queries or image inputs and generate new images in response.

Two such models, DALL-E 3 and Stable Diffusion, use a technique called diffusion. These models are trained by teaching a neural network to progressively remove a type of distortion from blurred images.<sup>44</sup> The network learns to reverse the process of adding noise. Once training is complete, they can generate images by starting with pure random noise and repeatedly applying the network to gradually denoise and refine the image until a final output is presented to the user.

For example, a generative AI user can prompt DALL-E 3 using the following simple line of text:

“Create a landscape of the night sky over a small town in the style of van Gogh.”

With this exact prompt, DALL-E 3 responded with the AI-generated output shown in Figure 2 below, on the left.<sup>45</sup> For comparison purposes, on the right is a copy of van Gogh’s *The Starry Night*.<sup>46</sup>

41 “Brands Target AI Chatbots as Users Switch from Google Search,” *Financial Times*, 26 April 2025, <https://www.ft.com/content/9cc6cc0b-759f-4b8e-9ed1-9e32ad0fe22f>.

42 “How AI Image-Generators Work,” *The Economist*, 10 July 2023, <https://www.economist.com/the-economist-explains/2023/07/10/how-ai-image-generators-work>.

43 LAION-5B, <https://paperswithcode.com/dataset/laion-5b>.

44 Minshu Chen et al, “Opportunities and Challenges of Diffusion Models for Generative AI” (2024) 11(12) *National Science Review*, <https://academic.oup.com/nsr/article/11/12/nwae348/7810289>. See also “How AI Image-Generators Work,” *The Economist*, 10 July 2023, <https://www.economist.com/the-economist-explains/2023/07/10/how-ai-image-generators-work>.

45 DALL-E 3, OpenAI, 27 April 2025, <https://chatgpt.com/>.

46 Vincent Van Gogh, *The Starry Night*, 1889, oil on canvas.



**Figure 2: Comparison of AI generated image and the starry night**



While the above-left van Gogh-inspired reproduction may not be particularly comparable to the original in the eyes of an art critic or enthusiast, it is important to note that the reproduction came together in about 10 seconds. It took approximately five seconds to enter a single prompt and another five seconds for the model to generate the image.

Also, within seconds, the user can note different outcomes they wish for the reproduction and write a second prompt for the model:

“Create a landscape of the night sky over a small town in the style of van Gogh, with more muted colours and the cypress tree in the foreground.”

One can observe a similar comparison, in Figure 3 below, between the generative AI asset created by the second prompt (left) and the original van Gogh (right).

**Figure 3: Comparison of iterated AI generated image and the starry night**



Thus, within seconds, the model generated an asset based on the user’s original prompt but also iterated the output based on user input.

Similar to text and images, generative AI applications are also available for code and video. As shown in Figure 4 below, companies involved in the creation of generative AI applications are found worldwide.

**Figure 4: Examples of global core gen AI companies by content type**

Content Generated	Example Platforms	Platform Owner
<b>Code</b>	CodeWhisperer Copilot Poolside	Amazon (US) GitHub (US) Poolside.ai (France)
<b>Images</b>	DALL-E Firefly Midjourney Stable Diffusion Veesual	OpenAI (US) Adobe (US) Midjourney (US) Stability AI (U.K.) Veesual (France)
<b>Text</b>	ChatGPT Claude DeepSeek DeepL Translator Gemini Mistral Perplexity SpinningBytes	OpenAI (U.S.) Anthropic (US) DeepSeek (China) DeepL SE (Germany) Google (US) Mistral AI (France) Perplexity (US) SpinningBytes (Switzerland)
<b>Video</b>	FancyTech Sora Synthesia Ying	FancyTech (China) OpenAI (US) Synthesia (UK) Zhipu AI (China)

### 3. Industry impact and why all insolvency professionals should understand the basics

#### 3.1 Economic context

A Federal Reserve Bank of St. Louis report has recently found that almost 40% of the United States population between ages 18 to 64 have used generative AI, and that it is being adopted faster than the internet or personal computer before it.<sup>47</sup>

Last year's CES, the leading technology trade show in the United States, was focused on generative AI.<sup>48</sup> JP Morgan projects that generative AI could increase global GDP by US \$7 to 10 trillion, or by as much as 10%, in 2024.<sup>49</sup>

Generative AI is already being applied to nearly every industrial sector, including data analysis, customer interactions, research and development, content creation and product design. In these sectors and others, the use of generative AI is rarely reserved for a single task or deliverable. For example, large media and entertainment studios are leveraging generative AI across their production process, from screenwriting and editing to visual effects and localisation.<sup>50</sup>

While the breadth of nascent applications is too broad to cover in depth here, a summary of emergent uses of generative AI across industries is provided in Figure 5 below. This is just a sample of adoptions of generative AI and is not meant to be comprehensive. The list below is demonstrative that the addressable market for companies that create generative AI products is diverse and large. This has contributed to the large valuations of these Core Gen AI companies.<sup>51</sup>

47 "The Rapid Adoption of Generative," The Federal Reserve Bank of St. Louis, 23 September 2024, <https://www.stlouisfed.org/on-the-economy/2024/sep/rapid-adoption-generative-ai>.

48 Imad Khan, "AI Is Dominating CES 2024 - You Can Blame ChatGPT For That," *CNET*, 11 January 2024, <https://www.cnet.com/tech/ai-is-dominating-ces-2024-you-can-blame-chatgpt-for-that/>.

49 "Is Generative AI A Game Changer?," *J.P. Morgan*, 14 February 2024, <https://www.jpmorgan.com/insights/global-research/artificial-intelligence/generative-ai>.

50 Jessica Toonkel and Sarah Krouse, "Who Owns SpongeBob? AI Shakes Hollywood's Creative Foundation," *The Wall Street Journal*, 4 April 2023, <https://www.wsj.com/articles/ai-chatgpt-hollywood-intellectual-property-spongebob-81fd5d15>; Will Douglas Heaven, "Welcome to the New Surreal: How AI-Generated Video is Changing Film," *MIT Technology Review*, 1 June 2023, <https://www.technologyreview.com/2023/06/01/1073858/surreal-ai-generative-video-changing-film/>; Audrey Schomer, "Generative AI in Film & TV: A Special Report," *Variety*, 1 December 2023, <https://variety.com/vip-special-reports/generative-ai-in-film-tv-1235792168/>.

51 *Bloomberg Intelligence*, "Generative AI to Become a \$1.3 Trillion Market By 2032, Research Finds," 1 June 2023, <https://www.bloomberg.com/company/press/generative-ai-to-become-a-1-3-trillion-market-by-2032-research-finds/>.

**Figure 5: Industry applications of generative AI<sup>52</sup>**

Industry	Applications of Generative AI
Advertising & Marketing	Ad copy <sup>i</sup> , campaign optimisation <sup>ii</sup> and customer segmentation. <sup>iii</sup>
Architecture & Civil Engineering	Generative design <sup>iv</sup> and urban planning simulations. <sup>v</sup>
Automotive	Autonomous driving, <sup>vi</sup> design and prototyping, <sup>vii</sup> predictive maintenance <sup>viii</sup> and in-car virtual assistants <sup>ix</sup>
Education	Personalised learning <sup>x</sup> , curriculum creation <sup>xi</sup> , automated grading <sup>xii</sup> and language education. <sup>xiii</sup>
Energy	Predictive maintenance, <sup>xiv</sup> delivery and consumption optimisation <sup>xv</sup> and simulation of energy systems. <sup>xvi</sup>
Entertainment & Media	Content creation (text, music, video), <sup>xvii</sup> special effects, <sup>xviii</sup> character design <sup>xix</sup> and scriptwriting. <sup>xx</sup>
Fashion	Trend prediction, <sup>xxi</sup> design automation, <sup>xxii</sup> and virtual fitting rooms. <sup>xxiii</sup>
Finance	Fraud detection, <sup>xxiv</sup> algorithmic trading, <sup>xxv</sup> risk management, <sup>xxvi</sup> customer service chatbots <sup>xxvii</sup> and financial forecasting. <sup>xxviii</sup>
Gaming	Procedural content generation, <sup>xxix</sup> AI-driven storytelling <sup>xxx</sup> and real-time animation. <sup>xxxi</sup>
Healthcare	Medical imaging analysis, <sup>xxxii</sup> personalised medicine, <sup>xxxiii</sup> synthetic data generation <sup>xxxiv</sup> and clinical documentation. <sup>xxxv</sup>
Human Resources	Resume screening <sup>xxxvi</sup> and recruitment. <sup>xxxvii</sup>
Legal	Contract review, <sup>xxxviii</sup> legal document drafting, <sup>xxxix</sup> case prediction and automated legal research. <sup>xl</sup>
Manufacturing	Product design, <sup>xli</sup> predictive maintenance, <sup>xlii</sup> quality control <sup>xliii</sup> and supply chain optimisation. <sup>xliv</sup>
Pharmaceuticals	Drug formulation, <sup>xlv</sup> drug discovery, <sup>xlvi</sup> clinical trial simulations <sup>xlvii</sup> and synthetic data generation for research. <sup>xlviii</sup>
Real Estate	Automated property valuations, customer profiling, <sup>xlix</sup> and personalised buyer searches and interactions. <sup>l</sup>
Retail & E-commerce	Personalised marketing, <sup>li</sup> virtual try-ons, <sup>lii</sup> inventory management, <sup>liii</sup> automated product descriptions <sup>liv</sup> and personalised shopping experiences. <sup>lv</sup>
Supply Chain & Logistics	Route optimisation, <sup>lvi</sup> carrier pricing and routing, <sup>lvii</sup> demand forecasting <sup>lviii</sup> and inventory management. <sup>lix</sup>
Telecommunications	Network optimisation <sup>lx</sup> and network maintenance. <sup>lxi</sup>

Historically, when there is a significant disruption, there are a few big winners and many other companies that fail. For Core Gen AI companies, failures could be due to high operational costs, uncertainty around scalability and evolving business models.<sup>53</sup>

Can Core Gen AI companies justify their current valuations if they will face a similar reckoning to that of the early 2000s “dot com” boom and bust, and subsequent insolvencies?<sup>54</sup> At risk are billions in investments – with an estimated worldwide raise of US \$56 billion in 2024 alone<sup>55</sup> – some of which could be subject to insolvency proceedings.

<sup>52</sup> Endnotes for this table are found at the end of this paper.

<sup>53</sup> “The Hidden Costs of AI: How Generative Models are Reshaping Corporate Budgets,” *IBM*, 14 October 2024, <https://www.ibm.com/blog/ai-economics-compute-cost/>.

<sup>54</sup> Sam Blum, “Warnings About an AI Bubble Are Growing – When Could It Burst?,” *Inc.*, 10 July 2024, <https://www.inc.com/sam-blum/new-warnings-ai-bubble-when-could-it-burst.html>: “As long as the AI goldrush, or arms race, or revolution – whatever you’d like to call it – has been surging, so too has speculation that the billions in investment are fuelling a massive bubble on par with the dot-com bust.”

<sup>55</sup> Kyle Wiggers, “Generative AI Funding Reached New Heights in 2024,” *TechCrunch*, 3 January 2025, <https://techcrunch.com/2025/01/03/generative-ai-funding-reached-new-heights-in-2024/>: “According to data from financial tracker PitchBook compiled for TechCrunch, generative AI companies worldwide raised \$56 billion from VCs in 2024 across 885 deals.”



### 3.2 Valuation of generative AI: dot.com parallels

The economic impact of generative AI may be observed in company valuations. Startups such as OpenAI and Anthropic are the new Silicon Valley “unicorns,” with valuations over US \$1 billion amid surging investment from established tech giants.<sup>56</sup> The stock value for Nvidia – a major provider of the computational power for generative AI – rocketed up 239% in 2023, and another 273% in 2024,<sup>57</sup> leading the *Financial Times* to report that “Nvidia earnings now rival US jobs report for impact on markets.”<sup>58</sup> This upward volatility has been met with a downward turn in 2025, with Nvidia’s stock down 17.34% year-to-date at the time of writing.<sup>59</sup>

These large valuations suggest that the impacts of generative AI are high, not just for the firms developing the platforms and for their investors but also for the users who hope to leverage the technology to generate resources and assets for their own enterprises. An *MIT Technology Review* survey of global executives has recently noted that a majority of respondents believe “generative AI technology will substantially disrupt our industry over the next five years.”<sup>60</sup>

As a comparison, the dot-com boom and bust of the late 1990s was also marked by unprecedented investment in technology firms – internet startups, driven by the promise of a digital revolution in commerce and communication. Venture capitalists and retail investors poured funds into nascent online companies, often valuing them based on speculative potential rather than actual profitability.<sup>61</sup> Many of these startups, such as Pets.com and Webvan, prioritised growth and market share over sustainable business models, resulting in rapid public listings with high valuations.<sup>62</sup> However, by 2000, scepticism over profitability and unsustainable spending led to a market crash, erasing over US \$5 trillion in market value from 2000 to 2002.<sup>63</sup> Many dot-com companies failed as a result, while a few survivors, like Amazon and eBay, adapted their strategies to emerge as dominant players in the digital economy.<sup>64</sup>

The current generative AI boom mirrors some aspects of the dot-com era. Companies like OpenAI<sup>65</sup> and Anthropic<sup>66</sup> have achieved multibillion-dollar valuations, often based more on their perceived transformative potential than demonstrated revenue streams.<sup>67</sup> This enthusiasm has prompted a surge in AI startups and venture funding.<sup>68</sup> As with the dot-com stocks of the late 1990s, the question is whether these valuations are sustainable or merely reflective of speculative hype.<sup>69</sup>

Many AI startups, like their dot-com predecessors, are heavily reliant on external investment and lack proven pathways to profitability.<sup>70</sup> While generative AI is an emerging technology, the valuation and insolvency paradigm impacting technology firms is not new. The late 1990s dot-com stocks were fuelled by investment in internet startups and expectations of a digital revolution in commerce and communication.

56 Hayden Field and Kif Leswing, “Generative AI ‘FOMO’ is Driving Tech Heavyweights to Invest Billions of Dollars in Startups,” *CNBC*, 30 March 2024, <https://www.cnbc.com/2024/03/30/fomo-drives-tech-heavyweights-to-invest-billions-in-generative-ai-.html>.

57 Beth McKenna, “Nvidia Stock Soared 82.5% in the 1st Quarter of 2024: Here’s What Drove the Leading AI Stock,” 30 March 2024, *Yahoo Finance*, <https://finance.yahoo.com/news/nvidia-stock-soared-82-5-160000409.html>; Stock Listing for NVIDIA, accessed 27 April 2025, <https://finance.yahoo.com/quote/NVDA>.

58 Rafe Uddin, “Nvidia Earnings Now Rival US Jobs Report for Impact on Markets,” *Financial Times*, 28 August 2024, <https://www.ft.com/content/3d3be98a-a0cc-46a6-8cf5-1c643e44a430>.

59 Stock Listing for NVIDIA, accessed 27 April 2025, <https://finance.yahoo.com/quote/NVDA>.

60 “Generative AI: Differentiating Disruptors From the Disrupted,” *MIT Technology Review Insight*, 29 February 2024, <https://www.technologyreview.com/2024/02/29/1089152/generative-ai-differentiating-disruptors-from-the-disrupted/>.

61 “The Late 1990s Dot-Com Bubble Implodes in 2000,” Goldman Sachs, <https://www.goldmansachs.com/our-firm/history/moments/2000-dot-com-bubble>: “From October 1998 onwards, markets cheered the seemingly endless IPOs of dot-com firms without paying much attention to the viability of their business models: a financial bubble was inflating. In spite of their huge market capitalizations, most of these internet startups would never generate any revenue or profit.”

62 Stephen Simpson, “Webvan And Other IPO Epic Failures,” *Forbes*, 13 December 2010, <https://www.forbes.com/sites/greatspeculations/2010/12/13/the-biggest-ipo-flops/>: “Although Webvan, eToys and Pets.com were not large IPOs at the time (\$375M, \$166M and \$83M, respectively), the stocks subsequently soared in the e-commerce/tech bubble of the late 1990s and became exhibits of the excesses of speculation.”

63 “The Dotcom Bubble Burst” (2000) *International Banker*, 29 September 2021, <https://internationalbanker.com/history-of-financial-crises/the-dotcom-bubble-burst-2000/>.

64 Kevin Kelleher, “5 Lessons From Survivors of the Dotcom Crash,” *Fortune*, 3 January 2014, <https://fortune.com/2014/01/03/5-lessons-from-survivors-of-the-dotcom-crash/>.

65 Deepa Seetharaman, Tom Dotan, and Barber Jin, “OpenAI Nearly Doubles Valuation to \$157 Billion in Funding Round,” *The Wall Street Journal*, 2 October 2024, <https://www.wsj.com/tech/ai/openai-nearly-doubles-valuation-to-157-billion-in-funding-round-ee220607/>.

66 Chris Ciaccia, “Amazon-Backed Anthropic in Talks to Raise Money at \$40B Valuation: Report,” *Seeking Alpha*, 23 September 2024, <https://seekingalpha.com/news/4152344-amazon-backed-anthropic-in-talks-to-raise-money-at-40b-valuation-report>.

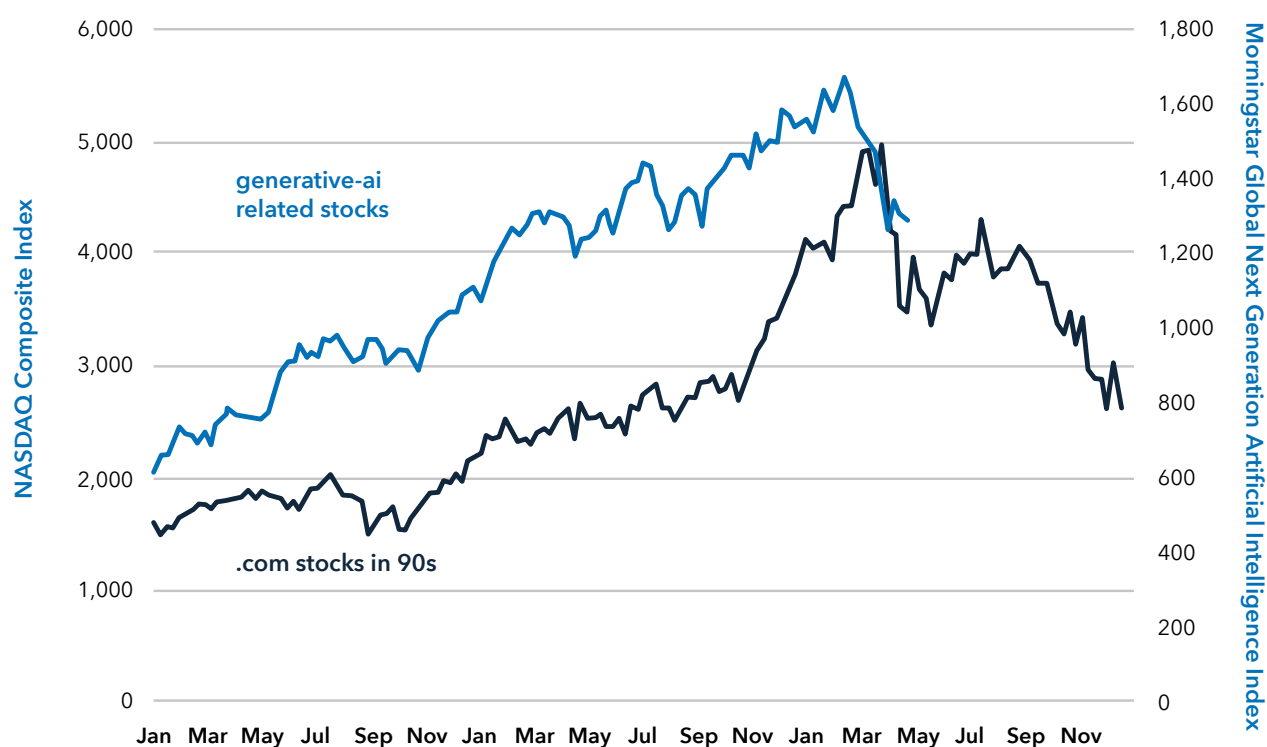
67 “OpenAI Has A \$157 Billion Valuation But It Might Not Change The World,” *Forbes*, 3 October 2024, <https://www.forbes.com/sites/petercohan/2024/10/03/openai-has-a-157-billion-valuation-but-it-might-not-change-the-world/>.

68 Rebecca Szkutak, “Here’s the Full List of 44 US AI Startups that Have Raised \$100M or More in 2024,” *TechCrunch*, 15 November 2024, <https://techcrunch.com/2024/11/15/heres-the-full-list-of-44-us-ai-startups-that-have-raised-100m-or-more-in-2024/>.

69 Will Knight, “Amazon’s Cloud Boss Likens Generative AI Hype to the Dotcom Bubble,” *Wired*, 7 February 2024, <https://www.wired.com/story/amazons-cloud-boss-selipsky-generative-ai-hype/>.

70 Clare Duffy, “Has The AI Bubble Burst? Wall Street Wonders if Artificial Intelligence Will Ever Make Money,” *CNN*, 2 August 2024, <https://www.cnn.com/2024/08/02/tech/wall-street-asks-big-tech-will-ai-ever-make-money/index.html>.

**Figure 6: Index of NASDAQ Composite Index (1998-2000) and Morningstar Global Next Generation Artificial Intelligence Index (2023-April 2025)**



Source: "Morningstar Global Next Generation Artificial Intelligence," *Morningstar*, <https://indexes.morningstar.com/indexes/details/morningstar-global-next-generation-artificial-intelligence-FS00001EKG?currency=USD&variant=TR&tab=overview>; NASDAQ Composite Index, CapIQ.

Figure 6 plots the NASDAQ Composite Index over the period 1998-2000, where dot.com stocks comprised a large component of the Index. We observe a large increase in the Index followed by a sharp drop after the dot.com bubble peaked on 10 March 2000. We observe from Figure 6 that an index of generative AI stocks, over the period 2023-2024, mirrors the upward movement of the dot.com stocks, and the 2025 period mirrors the downward movement of the dot.com stocks.<sup>71</sup> If Core Gen AI companies follow a similar pattern to the dot.com stocks, these companies may face the risks of a valuation bubble like those of past emerging technologies. Even without a technology bubble, risks to Core Gen AI companies, which could also result in their insolvency, include intellectual property right litigation risk,<sup>72</sup> competition from newer entrants<sup>73</sup> and regulatory rule making.<sup>74</sup>

## 4. Key considerations: valuation of core gen AI companies

### 4.1 Overview

It is axiomatic that the valuation of businesses focused on the development and commercialisation of emerging technologies is a challenging undertaking. A significant obstacle is the high degree of unpredictability associated with these businesses. While most valuations include a substantial margin of error,<sup>75</sup> the absence of historical performance and the difficulty of anticipating the sustainability and scalability of nascent products and applications makes the valuation task particularly complex. However, even valuing companies with an established record and business under accepted methodologies requires a measure of estimation uncertainty.<sup>76</sup> This is because the value of a business today is based on expectations of future events which entail forecasts and predictions<sup>77</sup> that require subjective judgments. Therefore, to reach a satisfactory estimate – which, ultimately, it is all a valuation can do<sup>78</sup> – it is crucial to follow established principles regarding future expectations, growth, and risk.

<sup>71</sup> The generative AI related stocks represent, "exposure to leading-edge artificial intelligence technologies, including generative artificial intelligence and adjacent products and services": see <https://indexes.morningstar.com/indexes/details/morningstar-global-next-generation-artificial-intelligence-FS00001EKG?currency=USD&variant=TR&tab=overview>

<sup>72</sup> Kate Knibbs, "Every AI Copyright Lawsuit in the US, Visualized," *Wired*, 19 December 2024, <https://www.wired.com/story/ai-copyright-case-tracker/>.

<sup>73</sup> Brian Eastwood, "Consumers Prefer Early Entrants in New Markets, But 2nd Movers Can Still Win," *MIT Sloan School of Management*, 22 October 2024, <https://mitsloan.mit.edu/ideas-made-to-matter/consumers-prefer-early-entrants-new-markets-2nd-movers-can-still-win>.

<sup>74</sup> "Regulators Are Focusing on Real AI Risks Over Theoretical Ones. Good," *The Economist*, 22 August 2024: <https://www.economist.com/leaders/2024/08/22/regulators-are-focusing-on-real-ai-risks-over-theoretical-ones-good>.

<sup>75</sup> "Barring a very small subset of assets, there will always be uncertainty associated with valuations, and even the best valuations come with a substantial margin for error": Aswath Damodaran, *Damodaran on Valuation: Security Analysis for Investment and Corporate Finance* (Wiley, 2<sup>nd</sup> ed, 2006), 4 (Damodaran on Valuation).

<sup>76</sup> *Idem*, 5.

<sup>77</sup> "From an economic perspective, value is derived from the future financial benefits that a company or a shareholder receives": "Valuation for Insolvency Practitioners" (2025), INSOL International, 12 (Valuation for Insolvency Practitioners), ([https://insol.azureedge.net/cmsstorage/insol/media/document-library/books/valuation-for-insolvencypractitioners.pdf?utm\\_campaign=1661001\\_Valuation%20book&utm\\_medium=email&utm\\_source=INSOL%20Internati](https://insol.azureedge.net/cmsstorage/insol/media/document-library/books/valuation-for-insolvencypractitioners.pdf?utm_campaign=1661001_Valuation%20book&utm_medium=email&utm_source=INSOL%20Internati))

<sup>78</sup> "When valuing an asset at any point in time, we make forecasts for the future. Since none of us possess crystal balls, we have to make our best estimates given the information that we have at the time of the valuation" (Damodaran on Valuation, 5).

At the time of this paper's publication, generative AI is experiencing an extraordinary degree of global market interest which rivals or surpasses that of prior emerging technologies.<sup>79</sup> In fact, generative AI has moved from concept to wide-ranging public embrace at a much faster pace than the path taken by previous market-disruptive technologies from early-stage startup to broad adoption.<sup>80</sup>

Presently, Core Gen AI companies may generate revenue through usage-based application programming interfaces (which allow developers to write code in Python, JavaScript, etc. which send requests to the AI model and gets responses automatically)<sup>81</sup>, or subscription models by way of a graphical user interface such as a website or app<sup>82</sup>. Additional revenue could be generated through cloud partnerships.<sup>83</sup> Examples of these partnerships include Microsoft embedding OpenAI models in Azure and Office 365 such as "Copilot" and shares revenue with OpenAI,<sup>84</sup> or Google's integration of Gemini into Workspace with added charges.<sup>85</sup> Another potential revenue source are consumer-facing applications that rely on generative engines and charge per seat or output. Examples include writing tools Jasper and Copy.ai, design through Canva with Magic Write, and video / image generation such as Runway, Midjourney, OpenAI's DALL-E). However, accurately forecasting where generative AI's development and revenue sources will ultimately land is highly speculative. Yet, considering historical precedent for technological disruptions of the scale generative AI exhibits, it is reasonable to anticipate that practitioners and courts alike will in due course be confronted with some Core Gen AI companies' distress and insolvencies, and will be compelled to value these businesses and their assets such as technologies and content.

This paper is not intended as a comprehensive valuation guide. There are already numerous academic and industry resources, and many court opinions, covering valuation practice.<sup>86</sup> Rather, this paper seeks to provide guidance for specific factors to be considered to conduct a valuation of Core Gen AI Companies under the selected or required valuation methodology (or methodologies) in the context of consensual restructurings and bankruptcy or insolvency proceedings.

## 4.2 Valuation methodologies commonly used in restructuring and insolvency<sup>87</sup>

A summary of common valuation methodologies in general restructuring and insolvency matters is provided in Figure 7 below. Both comparable companies and comparable transaction methods depend on valuation multiples, hence these methods are often called "the multiples method".

**Figure 7: Common valuation methodologies**

Method	Description
<b>Discounted Cash Flow (DCF)</b>	The process of valuing an investment by discounting its future cash flows. The discounted-cash-flow formula calculates present value (PV) as the value of expected future cash flows (CF) discounted at an appropriate rate (r) <sup>88</sup>
<b>Valuation Multiple</b>	Value is derived from the price of comparable companies using a key value driver such as EBITDA as a scaling factor, with EV/EBITDA being the most common one <sup>89</sup>
<b>Adjusted Net Present Value</b>	The net present value of a project or business if financed entirely by equity plus the present value of any financing side effects. These side effects might include the tax shield from debt financing, interest subsidies on debt financing, or the costs of issuing new securities <sup>90</sup>
<b>Comparable Transaction</b>	The prices paid in precedent transactions for companies similar to the valuation target <sup>91</sup>

- 79 Iuri Struta, "GenAI Funding Hits Record in 2024 Boosted by Infrastructure Interest," *S&P Global*, 22 January 2025, <https://www.spglobal.com/market-intelligence/en/news-insights/articles/2025/1/genai-funding-hits-record-in-2024-boosted-by-infrastructure-interest-87132257>; "OpenAI's New Fundraising is Shaking Up Silicon Valley," 19 September 2024, <https://www.economist.com/business/2024/09/19/openai-new-fundraising-is-shaking-up-silicon-valley>.
- 80 Alexander Bick, Adam Blandin and David J. Deming, "The Rapid Adoption of Generative AI," Federal Reserve Bank of St. Louis, Working Paper 2024-027A, September 2024, <https://s3.amazonaws.com/real.stlouisfed.org/wp/2024/2024-027.pdf>; "Generative AI has been adopted at a faster pace than PCs or the internet. Generative AI has a 39.5 percent adoption rate after two years, compared with 20 percent for the internet after two years and 20 percent for PCs after three years (the earliest we can measure it)."; Krystal Hu, "ChatGPT Sets Record for Fastest-Growing User Base - Analyst Note," *Reuters*, 2 February 2023, <https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/>; "[G]enerative AI technology will substantially disrupt our industry over the next five years." See also "Generative AI: Differentiating Disruptors From the Disrupted," *MIT Technology Review*, 29 February 2024, <https://www.technologyreview.com/2024/02/29/1089152/generative-ai-differentiating-disruptors-from-the-disrupted/>.
- 81 See, e.g., "API Pricing", OpenAI, <https://openai.com/api/pricing/>.
- 82 Bihag Karnani, "Subscriptions as a Revenue Model: Evolution, Comparisons and the Impact of Generative AI", *International Journal of Computer Trends in Technology*, Volume 72 Issue 12, 179-193, December 2024: "Generative AI (GenAI) products, including AI writing assistants, image generators and code creation tools, are on the rise, and many are available through subscription models."
- 83 Carugati, C. (2023) "The competitive relationship between cloud computing and generative AI", Working Paper 19/2023, Bruegel (stressing the synergy between cloud computing and GenAI for strategic partnerships, but also highlighting the competition risks derived from potential concentrations arising from the partnerships between cloud and GenAI providers).
- 84 Microsoft and OpenAI evolve partnership to drive the next phase of AI - The Official Microsoft Blog.
- 85 Gemini for Google Cloud: your AI-powered assistant | Google Cloud.
- 86 "The problem in valuation is not that there are not enough models to value an asset; it is that there are too many. Choosing the right model to use in valuation is as critical to arriving at a reasonable value as understanding how to use the model": Damodaran on Valuation, 649.
- 87 These options represent only a few alternatives from the myriad valuation methods available under the asset, income and market approaches. However, in the authors' experience, and absent exceptional circumstances, these are the most likely methods to be applied in restructuring and insolvency cases.

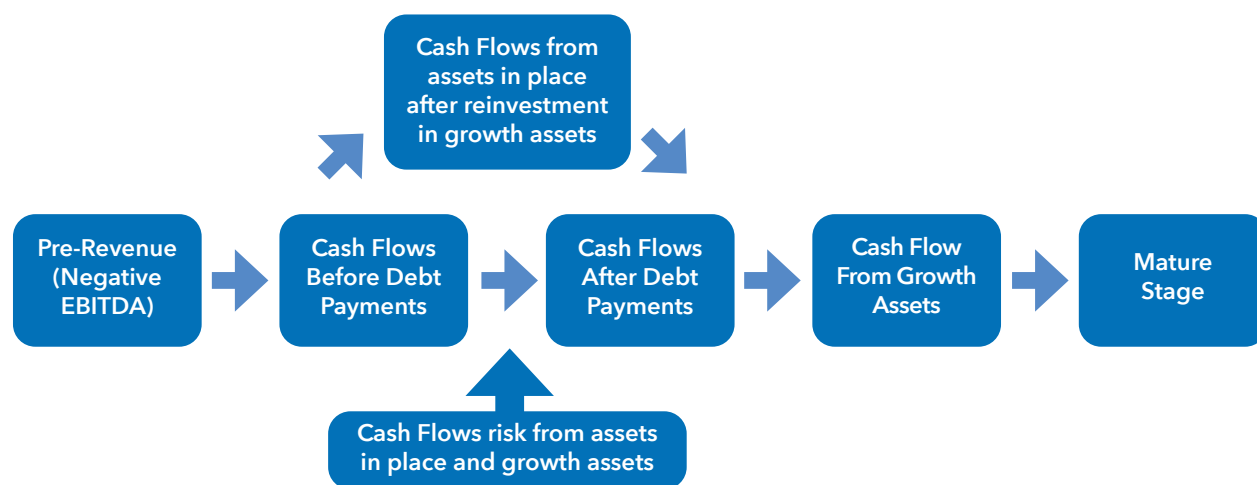
The first step in selecting the appropriate valuation methodology is to identify the reasons for conducting the valuation. In the context of restructurings and insolvencies, valuations are a fundamental tool "to help inform consensual restructuring negotiations, pre-pack administrations, share enforcements, share appropriations or as expert evidence to support formal court-sanctioned restructuring procedures such as schemes of arrangements (Schemes) or restructuring plans."<sup>92</sup>

In a recent illustrative survey study among members of INSOL International, the prevailing preference was the discounted cash flow (DCF) method, followed by multiples method and adjusted net present value.<sup>93</sup> While this was a single survey limited to 161 responses, it does highlight that valuations in insolvency cannot be prescriptive and are often selected on a case-by-case basis. With that in mind, we now address the factors to consider in selecting the most suitable methodology to value Core Gen AI companies in the context of restructurings or insolvencies.

Most Core Gen AI companies are presently "unicorn companies" or internal divisions of some of the largest technology companies in the world.<sup>94</sup> In general, there is limited financial information or reliable revenue and margin forecasts for these businesses. The combination of these factors prescribes a cautious approach to selecting either the market or DCF methods due to, respectively, a lack of comparable companies and unreliable projections.<sup>95</sup> But other methods customarily applied in the insolvency context are also likely to be inadequate without a multifaceted analysis. By this we mean that the specific models and formulas for any selected method (or methods), must be informed by an understanding of the industry, the technology (today and as it evolves), the competitive advantage or lack thereof (that is, does it have a unique value proposition?), market trends, how it will continue (or in some cases, when will it start) generating and growing revenue, and the expected profit margins over time. Finally, uncertainty must be priced into the calculation to arrive at a reasonable opinion of value capable of withstanding objections and judicial scrutiny.

To select the most adequate method (or methods), one should also consider the stage of the company, from startup to mature, as depicted in Figure 8 below.<sup>96</sup>

**Figure 8: Stages of a company's cash flows**



### 4.3 Selecting the valuation method for Core Gen AI Companies

We address here some important factors to consider when valuing Core Gen AI companies under the two most commonly used methods for valuation in the context of restructuring and insolvencies: the DCF and valuation multiples.<sup>97</sup>

<sup>88</sup> Brealey, R. A., Myers, S. C., & Allen, F., *Principles of Corporate Finance* (13th ed, 2020).

<sup>89</sup> *Valuation for Insolvency Practitioners*, 17.

<sup>90</sup> Brealey et al., *Principles of Corporate Finance*.

<sup>91</sup> Rosenbaum, J., & Pearl, J., *Investment Banking: Valuation, LBOs, M&A, and IPOs* (3rd ed, 2020).

<sup>92</sup> *Valuation for Insolvency Practitioners*, 22.

<sup>93</sup> *Idem*, 9. In addition, survey participants also mentioned the comparison approach, net asset value, fair market value vs. forced liquidation value, and fire sale, although these methods represented only 5% of total responses.

<sup>94</sup> Microsoft (Copilot, Azure), Alphabet (Gemini, Vertex AI, LaMDA, PaLM 2), Meta (Meta AI, Llama 2, Llama 3.3).

<sup>95</sup> Zhizhen Chen, "Valuation of AI Companies: Leveraging Large-Language Models and Deep Learning Approaches" in *2024 10th International Conference on Computer Technology Applications (ICCTA)*, 15-17 May 2024, Vienna, Austria (<https://doi.org/10.1145/3674558.3674601>): "Traditional valuation methods, such as discounted cash flow (DCF) analysis, heavily rely on historical financial data and stable cash flow projections, elements that are often scarce in the case of unicorn companies. Their emphasis on rapid expansion, market share acquisition, and innovation introduces uncertainties that make predicting future cash flows challenging. Furthermore, unicorn companies frequently operate in industries with disruptive business models and cutting-edge technologies, adding an additional layer of complexity to the valuation process. The absence of comparable companies or precedents with similar characteristics further complicates the application of standard valuation techniques."

<sup>96</sup> Figure 8 is informed and derived from Prof. Damodaran's comments and illustrations in his paper "Living With Noise: Valuation in the Face of Uncertainty", (2013) 2 *Journal of Applied Finance* (Valuation in the Face of Uncertainty).

<sup>97</sup> As noted previously, there are many other methodologies which may be applied in the context of restructuring and insolvencies, and practitioners should select the most adequate one under the circumstances.

### 4.3.1 DCF (income method)

It is noteworthy that, in the INSOL survey referred to above, a plurality of experienced insolvency professionals favoured the DCF valuation method.<sup>98</sup> DCF is most useful in connection with businesses or assets with predictable and stable cash flows over time. Of course, companies often enter a restructuring or insolvency for reasons unrelated to cash flow stability (e.g. high debt burden), and the outcome of such processes, except for liquidation, is premised on a balance sheet-solvent and cash flow positive business. On the other hand, emerging technology insolvencies are more likely to involve businesses with uncertain cash flow projections and volatility.<sup>99</sup> Since the factors underlying a valuation depend on market participants' outlook regarding cash flow, risk and growth,<sup>100</sup> one could argue that incorporating market expectations into a DCF model would address some of the implicit uncertainty of a future enterprise with a limited track record and a rapidly-evolving business model. The problem, as addressed earlier in this paper, is that the business model for emerging technology is highly uncertainty and often un-precedented.<sup>101</sup> For that reason, we recommend considering the factors summarised in Figure 9 below for a valuation of Core Gen AI companies when using the DCF method (in addition to the customary factors for a DCF).

**Figure 9: DCF valuation factors**

Revenue Projection	Operating Income to Net Income	Risk Adjusted Discount Rates	Terminal Value Sensitivity	Competitive Dynamics	Regulatory and Legal Risk
<ul style="list-style-type: none"> <li>Model multiple scenarios with varying growth rates</li> </ul>	<ul style="list-style-type: none"> <li>Timeline for cash flows after debt service</li> </ul>	<ul style="list-style-type: none"> <li>Stage-based discount rates – higher to lower depending on growth-to-maturity factors</li> </ul>	<ul style="list-style-type: none"> <li>Multiple approaches for terminal value calculation</li> </ul>	<ul style="list-style-type: none"> <li>If the business has a competitive advantage, assess potential threats</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate scenarios for potential regulatory changes impacting the business</li> </ul>
<ul style="list-style-type: none"> <li>Consider market size and penetration rates</li> </ul>	<ul style="list-style-type: none"> <li>Model margin pressure as the industry matures</li> </ul>	<ul style="list-style-type: none"> <li>WACC transition from prevailing cost of equity to balanced cost of equity / cost of debt</li> </ul>	<ul style="list-style-type: none"> <li>Multiple approaches for terminal value calculation</li> </ul>	<ul style="list-style-type: none"> <li>Consider cohort analysis in projections</li> </ul>	<ul style="list-style-type: none"> <li>Assume jurisdictional risks if the business is global</li> </ul>
<ul style="list-style-type: none"> <li>Assume when growth will eventually normalize</li> </ul>	<ul style="list-style-type: none"> <li>Conduct economic unit analysis over time</li> </ul>	<ul style="list-style-type: none"> <li>Use historical parallels from discount rates related to prior emerging technologies</li> </ul>	<ul style="list-style-type: none"> <li>Apply terminal multiples from mature examples of prior emerging technologies which have become mainstream</li> </ul>	<ul style="list-style-type: none"> <li>Estimate evolution of customer acquisition costs and challenges</li> </ul>	<ul style="list-style-type: none"> <li>Account for legal uncertainty related to AI in general</li> </ul>

### 4.3.2 Multiples (market method)

The valuation multiples approach is another method favoured in many restructurings or insolvencies, as it allows the use of value drivers such as EBITDA or EBIT to compare the target to similar companies for which such information is available. This is obviously challenging for companies with negative operating income, and even more so for pre-revenue companies, for which asset values would be more appropriate. A further complication with Core Gen AI companies is the lack of relevant detailed information for similar businesses, although this may change as some of these businesses become publicly traded. Nevertheless, to the extent the valuation target has positive EBIT or EBITDA, or negative EBIT or EBITDA that can be projected to become positive as a result of the restructuring or insolvency process, we suggest the factors outlined in Figure 10 below when applying the multiples approach to valuing Core Gen AI companies (in addition to the customary factors for a multiples valuation).

<sup>98</sup> Valuation for Insolvency Professionals, 9.

<sup>99</sup> Chih-Wei Wang, Chien-Chiang Lee, Lin-Tan Wu, "The Relationship Between Cash Flow Uncertainty and Extreme Risk: International Evidence," (2023) 77 *Pacific-Basin Finance Journal* 77, <https://www.sciencedirect.com/science/article/abs/pii/S0927538X22002220>;

<sup>100</sup> Mercer Z.C. and Harms, T. W, *Business Valuation: An Integrated Theory* (2021) 133.

<sup>101</sup> Valuation in the Face of Uncertainty, 11.



**Figure 10 Multiples (market method) valuation factors**

Comparable Companies	Multiple Selection	Growth Adjusted Multiples	Precedent Transactions	Illiquidity Discounts	Milestone Based Factors
<ul style="list-style-type: none"> <li>Relevant peers with similar business models and growth profiles</li> <li>If needed, consider companies at similar stages of development in other sectors</li> <li>Relevant historical examples of emerging technology companies at similar stages</li> </ul>	<ul style="list-style-type: none"> <li>Forward-looking multiples may be more appropriate</li> <li>If the company has no earnings, use revenue multiples</li> <li>Consider specialized metrics relevant to the specific business model</li> </ul>	<ul style="list-style-type: none"> <li>Apply industry-specific metrics to growth ratios to account for different growth rates</li> <li>Normalize for different growth trajectories among comparable businesses</li> <li>Consider running a regression analysis to determine the relationship between growth and valuation</li> </ul>	<ul style="list-style-type: none"> <li>Look for acquisitions of similar companies</li> <li>If none are available, look for publicly-available information of funding rounds</li> <li>Review financial information from established businesses to extract relevant subsidiary information</li> </ul>	<ul style="list-style-type: none"> <li>Determine appropriate discounts for lack of marketability</li> <li>Consider the stage of the company when determining the extent of the discount</li> <li>Factor in the time to a potential liquidity event</li> </ul>	<ul style="list-style-type: none"> <li>Value different stages of development separately</li> <li>Look at option value of different growth paths</li> <li>Delve into technology development target details to incorporate into the valuation</li> </ul>

### 4.3.3 Other methods

If the circumstances require the insolvency professional to use one of the other methods listed (or not listed) above, the approach should be like the one outlined for DCF and multiples. Namely, the valuation should use one or more methods and take into consideration the specific facts, circumstances and unique aspects of the business in question in the context of market competitors and foreseeable risks. The final valuation should emerge not from formulaic calculations alone, but from a rigorous multifaceted analysis that withstands the critical examination of creditors, equity stakeholders, and judicial review. A defensible valuation requires thoughtful judgment that transcends the mechanical application of formulas to create a robust foundation that can endure intense scrutiny.

An example of an alternative approach that is pertinent at the time of this paper's publication are valuation principles related to venture capital (VC)-backed businesses. As discussed earlier, many current Core Gen AI businesses are "unicorn companies," a term derived from VC-backed investments.<sup>102</sup> Until such time as Core Gen AI companies become established businesses with lengthy track records, principles customarily applied to value VC-backed firms can also be effective tools for determining their value, particularly when combined and contrasted with the results from the other techniques outlined above. While the literature on VC-backed valuations generally concentrates on "post-money" valuation of early-stage businesses during investment rounds<sup>103</sup> – in other words, their potential for growth – the uncertainty and long-term horizon of startups requires prudent consideration of parameters such as volatility, exit rate (or inversely, their failure rate), M&A and IPO exit probability, and the risk-free rate,<sup>104</sup> some of which are relevant to value emerging technology businesses undergoing a restructuring or insolvency process. As with the valuation methodologies noted above, there is considerable academic and industry literature about the valuation of VC-backed firms which can inform practitioners and courts alike if this approach is incorporated in the appraisal.<sup>105</sup>

102 Gornall, Will and Strebulaev, Ilya A., "Squaring Venture Capital Valuations with Reality" (2019) *Journal of Financial Economics*, <https://ssrn.com/abstract=2955455> or <http://dx.doi.org/10.2139/ssrn.2955455>.

103 *Ibid.*

104 *Idem*, subsections 2.4 and 4.3.

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## 5. Conclusion

Generative AI is widely regarded as one of the most significant technological developments in recent decades, with the potential to transform industries, disrupt business models and generate considerable economic value. However, as with previous waves of technological innovation, including the dot-com era and the recent crypto cycle, such rapid advancements are often accompanied by substantial volatility and risk to the underlying business. Core Gen AI companies, many of which are early-stage or venture-backed, face a range of economic, legal, and operational uncertainties that may result in financial distress or insolvency. For this reason, it is relevant for insolvency professionals to become familiar with the fundamental aspects of this emerging sector.

In this paper, we have endeavoured to provide a basic overview of generative AI and to highlight some of the valuation challenges that may arise when Core Gen AI companies enter into a restructuring or insolvency proceeding. We hope that it serves as a useful starting point for practitioners seeking to develop a deeper understanding of the technology, and that our suggested approaches can be employed as a helpful enhancement to the application of well-established valuation principles. As the technology continues to evolve and as legal and regulatory frameworks develop in parallel, we anticipate that the treatment of generative AI firms in insolvency contexts will become an increasingly important area of professional focus—one that will be shaped over time by further scholarship, practitioner commentary and court opinion.

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INSOL International, 29-30 Ely Place, London, EC1N 6TD  
Tel: +44 (0) 20 7248 3333

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