LOM 1992

Weekly Global Market Commentary

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Generative Pretrained Transformers: Applications and Implications

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Breakthroughs in generative artificial intelligence have led to a bit of a speculative mania in markets in recent years. Companies have been grappling with how and whether to use the technology. Let's cut through some of the hype and leave you better informed on how the technology works, its current limits, and its impacts on markets.

A Generative Pretrained Transformer (GPT) is a type of computer model. The model is typically trained in one specific type of task (e.g., creating a text response or creating a picture). To complete the task, developers have given it lots of examples that it has broken down into "tokens." Tokens could be each word in a sentence or each pixel in an image. The model then uses these examples to find relationships between those tokens. For example: the cars wheels are _____. The next word is probably "round" but other answers like "black" or "made of rubber" would work too. When a program like ChatGPT is responding to you, it is basically playing a very fast game of fill in the blank.

Since transformer architecture relies on probabilistic relationships between tokens, these models tend to perform better on tasks where the outputs are more predictable. DeepMind's AlphaFold was able to leverage the transformer architecture to rapidly map the 3D shape of protein structures based on their amino acid sequences. This has direct impacts on the cost of drug design and understanding diseases like Alzheimer's and Parkinson's.

Chatbots are effective at generating computer code. While it helps programmers code and debug much more efficiently, the transformative gains are being made in the white-collar space. Now that you can code using natural language, the barriers to entry are significantly lower. Knowledge-based workers tend to be heavily reliant on repeatable processes and data to complete their tasks. With programs like ChatGPT, it is possible to translate your domain knowledge into automated processes. Tasks like cleaning data, sending emails, and analyzing data are easy targets for automation if you have a structured, repeatable process.

On the commercial front, people are experimenting with using chatbot networks to complete more complicated tasks. There are some prototypes that can make a grocery list then go online and buy those items, with a chatbot explaining what steps need to be taken and other bots executing those actions. It is not ready for primetime yet but presents some interesting possibilities.

There are limits to GPT technology. Since the output is probabilistic, GPTs tends to "hallucinate" (saying things that sound plausible but aren't true). Newer versions have gotten better at managing this risk, but it is still a problem. You can reduce hallucinations by providing very narrow instructions (adding "context") and verifying any assertions that it makes in its output before acting on it. Asking for attribution tends to help too, though a Google search is currently more effective. Programs like ChatGPT 4 are trained on data up to a specific point in time but can perform Google/Bing searches when prompted (though this is a slower process).

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Privacy is another concern. Depending on the model you are using, the company may train on your prompts and output. That raises concerns over updating proprietary code in certain systems or using client data. There are several paid, enterprise versions that won't train on your data, or allow the company to put guard-rails in to prevent employees from accidentally putting the data in to begin with.

There appears to be real economic gains behind GPT technology. How this affects the economy is going to be a function of the rate of adoption. We have seen massive investment in the underlying architecture. Over the last few years, we have seen heavy investment into NVIDIA (a chipmaker at the heart of these models) and Super Micro Computers (which makes the servers the models are trained on). More recently, investors have been considering the impacts on the energy production required to support training and distribution of these models.

For white-collar workers, the economics suggest there is going to be a strong incentive towards adoptions. We have observed financial and reinsurance industries appear to be adopting Microsoft CoPilot, which can help with editing and creating presentations, tap into your data and allow the business to provide guardrails to protect the firm's data. Effective utilization seems to rely on domain knowledge and a multidisciplinary approach.

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Stock Market Performance				
	4/20/2024	W-o-W	M-o-M	Y-o-Y
DJIA	37,986	0.0%	-3.9%	12.4%
S&P 500	4,967	-3.0%	-4.9%	20.3%
MSCI World	3,256	-2.8%	-4.7%	15.3%
SP/TSX	21,807	-0.4%	-1.1%	5.7%
BSX	2,283	-1.7%	0.8%	4.4%
FTSE100	15,408	-1.3%	2.4%	3.9%
DAX	17,737	-1.1%	-1.5%	12.3%
CAC	8,022	0.1%	-1.7%	6.4%
Nikkei	37,068	-6.2%	-7.3%	29.3%
Hang Seng	16,224	-3.0%	-1.9%	-20.5%
Shanghai	3,065	1.5%	-0.5%	-9.0%

Key Rates and Prices			
Currencies	4/20/2024	Month Ago	Year Ago
EUR	$1.07	$1.09	$1.10
GBP	£1.24	£1.28	£1.24
JPY	¥154.64	¥151.26	¥134.24
CAD	C$0.73	C$0.74	C$0.74
CHF	CHf1.10	CHf1.13	CHf1.12
AUD	A$0.64	A$0.66	A$0.67
Fixed Income			
3M LIBOR	5.59	5.59	5.27
3M Treasury Bill	5.41	5.39	5.08
2Yr Treasury Note	4.99	4.60	4.14
10Yr Treasury Note	4.62	4.27	3.54
Fed Funds Rate	5.50	5.50	5.00
Commodities			
Gold/oz.	2,391.93	2,186.39	2,004.80
Silver/oz.	28.69	25.58	25.29
Copper/lb.	4.48	4.05	4.03
Oil	83.14	81.68	77.29

Global Economic Calendar (Apr 22nd to 26th)	
Monday	
Tuesday	HCOB france Manufacturing PMI (FR);
Wednesday	IFO Business Climate (GE)
Thursday	GDP Annualized QoQ (US); Initial Jobless Claims (US)
Friday	IBGE Inflation IPCA-15 MoM (BZ); U. of Michigan Sentiment (US)

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