

中国汽车 China Autos

FSD Supervised、Robotaxi 和特斯拉智驾的 ChatGPT 时刻

FSD Supervised, Robotaxi and Tesla AD's ChatGPT Moment

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热点速评 Flash Analysis

(Please see APPENDIX 1 for English summary)

事件

美国当地时间 3 月 18 日，特斯拉在北美地区全面推送 FSD V12.3 版本；3 月 30 日，FSD V12.3.3 版本推送，FSD 首度摘帽 Beta，后缀改为 Supervised（受监管），正式面向公众测试，并向全美至少 200 万位特斯拉车主开放免费使用一个月。FSD V12.3 在算法层面做出了大胆创新，用“端到端神经网络”AI 系统完全取代以往依赖于手动编码规则和机器学习模型的方法。我们持续跟踪多位海外社媒博主的真实路测，惊讶于 V12.3 版本在处理大多数复杂路况下已能做出接近甚至超越人类司机的决策执行，并能在 90% 以上行驶中提供非常高的丝滑度和更少的介入接管。

点评

FSD V12.3 与前代 Beta 版有何不同？ 1) **处理日常复杂场景时流畅无误：** 多位海外博主展示了新版本遇到环岛/转盘通行、停车场内部路绕行、单行道窄路会车、以及通用障碍物避障等场景都能设法顺利通过，确保日常 90% 的使用场景顺畅无需人工接管（如 4 月 2 日拯救了美国一位胰岛素急救车主）； 2) **越来越懂人类：** 多位博主测试得出 V12.3 版本可识别行人或交通指挥者的眼神交流/手势，做出精准的通行/让行和变速、变道判断，在充分遵守美国路权法规和意识的同时最大可能实现体验无断点； 3) **L4 级高阶驾驶功能初体验：** 新版本展示了汽车到达目的地/导航信息有误时会主动脱离导航指引，完全基于纯视觉信息继续前行，尽可能靠近指定目的地，甚至能在一片在建工地（无划线）中找到离定位最近的停车位。这种更符合“哪里都能开”定语的智驾能力预示着特斯拉在实现真正的点到点自动驾驶方面取得了重大进展，在未来几个新版本中我们很快将看到更接近 L4 的“点到点”智能召唤及代客泊车功能； 4) **软件版本迭代速度大幅提高：** 特斯拉 V12 从传统“感知-归控-执行”架构转变为“端到端”架构，人工代码被大量替换，模型迭代效率快速提高，从 V12.2 到推送 V12.3 用了 10 天，V12.3 到 V12.3.1 仅用一周，而 V12.3.2 到 V12.3.3 更是仅用 5 天，已超越马斯克此前宣称的“每两周一次”的更新频率。我们认为算力已经不再是限制 FSD 迭代的瓶颈，而随着 FSD 订阅量的快速增长，每日海量行驶数据将加速软件迭代的飞轮效应。特斯拉计划在今年 10 月达到 100eplops 的总算力，在云计算方面将进一步拉大与其他主机厂之间的差距。

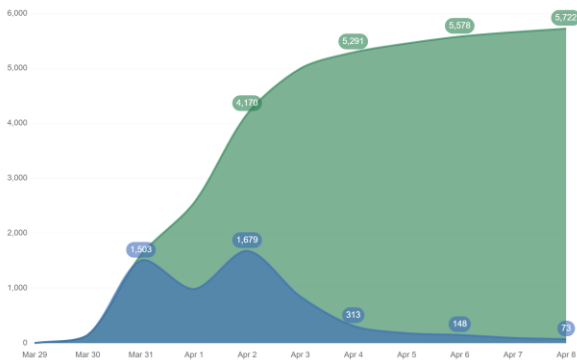
Robotaxi 发布将近，特斯拉智驾的 ChatGPT 时刻还有多远？ 4 月 5 日特斯拉宣布 8 月 8 日将推出 Robotaxi，并指出将不会取消入门级车型（Model 2/Q）的生产计划。特斯拉规划中的入门级车型平台同时适用于生产 Model 2/Q 及 Robotaxi，我们判断特斯拉同时需要 Robotaxi 的亮相为公司估值打开更多想象空间，及 Model 2/Q 的量产来应对欧美地区疲弱的购车需求和中国市场的竞争加剧。目前美国和加拿大的 FSD 买断价格分别为 US\$12,000 和 CAD16,000，而美国 FSD 订阅费为 US\$199/月，Robotaxi 推出后特斯拉可以组建一支自动驾驶出租车队，可能同时带来更为灵活的 FSD 收费方案，为公司快速增加经常性收入。我们预测 FSD 软件业务稳态毛利率可达 70% 以上，对于近期单车利润持续承压的特斯拉来说可谓扭转局势的关键。我们认为公司 4Q24 起将全力加快 Robotaxi 的软硬件量产，并推动 FSD 进入包括欧洲和中国在内的全球主流市场，促进特斯拉智驾的 ChatGPT 时刻到来。

后续版本及 Robotaxi 标杆效应有望为 FSD 带来渗透率拐点，推动软件收入爆发增长。 据特斯拉软件追踪网站 TeslaFi.com 统计，FSD V12.3.3 (Supervised) 是目前在参与 FSD 测试车辆中安装比例最高的版本。截至美国时间 4 月 8 日，在其付费用户登记的 19,868 辆特斯拉车辆中，有 5,722 辆安装了 V12.3.3 版本，约 30% 的车辆更新到了最新版。而从整体用户看，由于 FSD 完全自动驾驶功能推送多次推迟以及定价提高，特斯拉北美新车 FSD 搭载率从 2019 年 50% 水平一路下滑至目前 10% 左右水平。我们认为，FSD V12 版本已经证明新模型强大泛化能力，随算法迭代加速，8 月 Robotaxi 推出可为乘用车用户付费提供性能背书，有望在今年扭转 FSD 新车搭载率下降趋势甚至带动老用户升级，相关软件服务或将实现翻倍增长。

风险

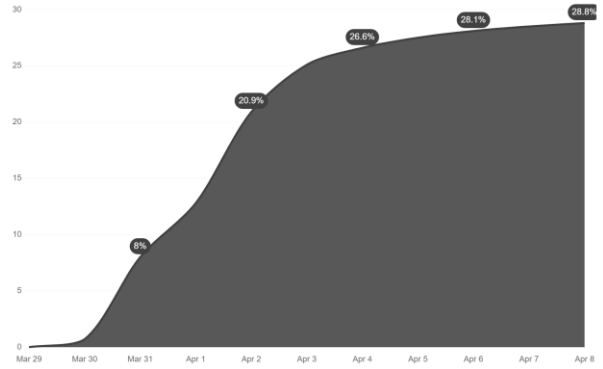
FSD 迭代不及预期，新平台和车型量产不及预期，竞争加剧风险，宏观经济下行。

图 1 单日 FSD V12.3.3 安装更新量 vs 总更新量 (付费用户登记)



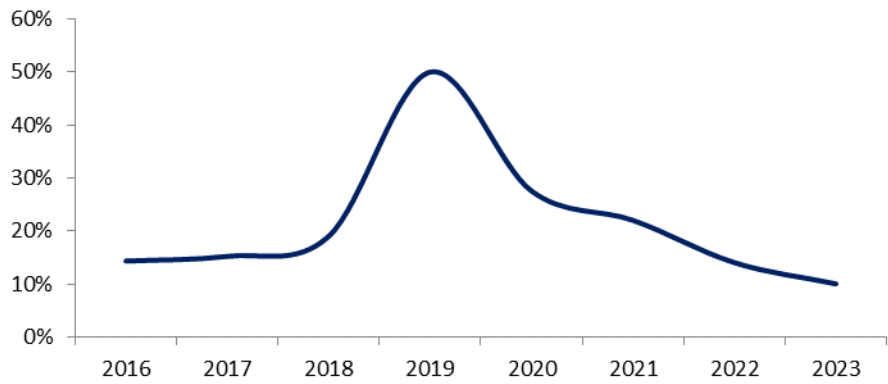
资料来源: TeslaFi.com, 海通国际

图 2 FSD V12.3.3 安装率 (付费用户登记)



资料来源: TeslaFi.com, 海通国际

图 3 特斯拉北美 FSD 新车搭载率



资料来源: Troy Teslike, 海通国际测算

APPENDIX 1

Summary

Event

On March 18, local time in the United States, Tesla comprehensively rolled out the FSD V12.3 version in North America. On March 30, the FSD V12.3.3 was released, marking the first time FSD was unlabelled as Beta, changing its suffix to Supervised for official public testing, and opened to at least 2 million Tesla owners in the United States for a month of free trial. FSD V12.3 made bold innovations at the algorithmic level, completely replacing the previous reliance on manually coded rules and machine learning models with an "end-to-end neural network" AI system. We have continued to track the real road tests of several overseas social media influencers and are amazed that the V12.3 version can make decisions and execute actions that are close to or even surpass human drivers in handling most complex road conditions, offering a very high smoothness and less intervention in over 90% of driving situations.

What sets FSD V12.3 apart from the previous Beta version?

- 1) Smooth and error-free handling of daily complex scenarios;
- 2) Increasingly understanding humans;
- 3) Initial experience of L4-level advanced driving features;
- 4) Significantly increased software iteration speed.

With the imminent release of Robotaxi, how far is Tesla's smart driving from the ChatGPT moment? On April 5, Tesla announced that Robotaxi would be launched on August 8 and pointed out that the production plan for the entry-level model (Model 2/Q) would not be canceled. The entry-level model platform planned by Tesla is also suitable for producing Model 2/Q and Robotaxi. We believe that Tesla needs both the debut of Robotaxi to open up more imaginative space for the Company's valuation and the mass production of Model 2/Q to cope with the weak auto demand in Europe and America and the intensifying competition in the Chinese NEV market. Currently, the buyout prices of FSD in the United States and Canada are US\$12,000 and CAD16,000, respectively, while the US FSD subscription fee is US\$199/month. After the launch of Robotaxi, Tesla can form an autonomous taxi fleet, potentially bringing more flexible FSD charging schemes to rapidly increase the company's recurring income. We predict that the steady-state gross margin of the FSD software business can reach over 70%, which is key for Tesla, which has been under continuous pressure on per-vehicle profits recently. We believe the company will fully accelerate the mass production of Robotaxi's hardware and software from 4Q24 and promote FSD to enter global mainstream markets, including Europe and China, to usher in Tesla's smart driving ChatGPT moment.

Subsequent versions and the benchmark effect of Robotaxi are expected to bring a penetration inflection point to FSD, driving explosive growth in software revenue. According to the Tesla software tracking website TeslaFi.com, FSD V12.3.3 (Supervised) is currently the version with the highest installation rate among vehicles participating in the FSD public test. As of April 8 US time, among its paying users' registered 19,868 Tesla vehicles, 5,722 have installed the V12.3.3, with about 30% of the vehicles updated to the latest version. Looking at the overall users, due to several delays in the full autonomy feature rollout and price increases, the North American new car FSD take rate has slid from a 2019 level of 50% to about 10% now. We believe that the FSD V12 version has proven the new model's strong generalization ability. With the acceleration of algorithm iteration, the launch of Robotaxi in August can provide a performance endorsement for passenger car users to pay, likely reversing the downward trend of the new car FSD take rate this year and even driving old users to upgrade, with related software services possibly achieving double growth.

Risks: FSD iteration is not as expected; new platform and model mass production are not as expected; increased competition risk; economic downturn.

附录 APPENDIX

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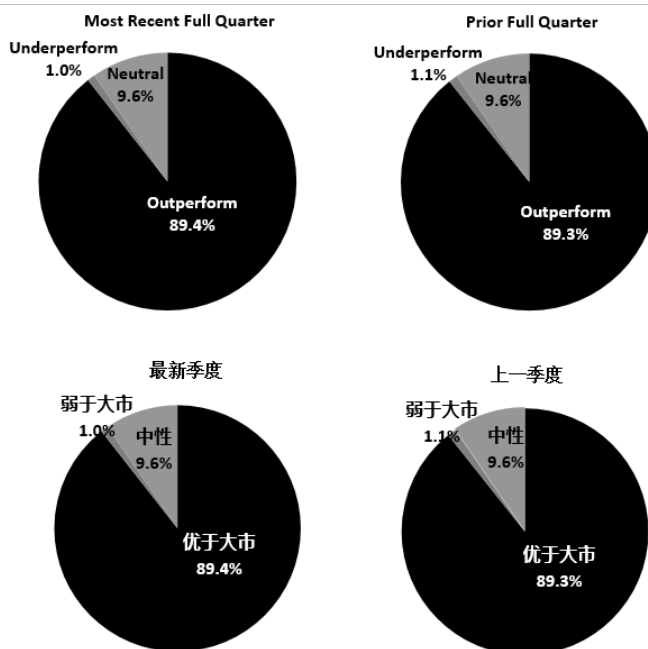
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Outperform: The stock's total return over the next 12-18 months is expected to exceed the return of its relevant broad market benchmark, as indicated below.

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