Understanding the Chip Market – Definition, Classification, Value Chain and Global Status

Hung Nguyen – *hung.nb@vdsc.com.vn*

- A chip (also known as an IC) is a sophisticatedly fabricated, silicon wafer that contains millions to billions of tightly integrated electronic components.
- The value of the global semiconductor industry has grown explosively from the Covid-19 period, reaching USD 700 mn in 2025, expected to reach USD 1,000 mn in 2030, implying the expansion of the chip market size.
- The quartet of the United States - China - Taiwan - South Korea are the names that control the global chip industry game, dividing the main roles in the global semiconductor industry value chain as shown below, implying that any geopolitical fluctuations related to this quartet will significantly affect the outlook for global chip production and prices. In particular, the US controls core technologies in the chip industry such as IP & EDA, Design, Equipment, China-Taiwan-Korea controls chip industry inputs such as semiconductors, silicon wafers and test and assembly (ATP) outputs.

Definition of Chip

A chip (also known as an IC) is a sophisticatedly fabricated, silicon wafer that contains millions to billions of tightly integrated electronic components. Chips are likened to the "brain" of most modern electronic devices when they can perform billions of calculations per second related to memory storage (RAM) or processing (CPU/GPU/SoC) in terms of image display, camera processing, 5G/Wi-Fi connection, facial recognition… The process of making a semiconductor chip is one of the most complex technologies, usually taking about 3 months (12-16 weeks) with 700 steps per rigorous technical step on the silicon wafer (according to the article "Three months, 700 steps: Why it takes so long to produce a computer chip" published in the Washington Post).

Sketch of the structure of a modern chip

	Parts	Function
Chip Case	Package (protective case, usually black plastic or ceramic, with metal feet)	Protects the chip core (die) from dust, moisture, and collisions, and helps connect to the motherboard (PCB), which partially dissipates heat.
	Bonding wires or bumps (gold or ball welded extension wires)	Connect the power from the chip (die) to the package pin to transmit data.
	Heat spreader	Quickly dissipates heat outwards so that chips don't overheat when operating under overload.
Chip (Die)	Substrate (thin, pure silicone base) (*)	As the mechanical and electrical foundation for the whole chip. Substrate provides a clean surface for building transistor and circuit layers, and conducts heat well.
	Well/Active layer (P-well, N-well doping zone)	Create a P or N type semiconductor region to form a transistor. This layer helps determine the location and type of transistor (NMOS/PMOS), helping the transistor to function properly (current on/off).
	Transistor layer (transistor layer, with Source, Drain, Channel, Gate)	Contains billions of microscopic transistors (transistors). Each transistor is a basic switch that turns on/off super-fast current to handle basic logic (0/1) of computing, temporary storage, and making up the CPU/GPU/NPU.
	Interconnect layers (10–20 layers of metal, usually Cu copper, low-k insulation interlayers)	As "highway systems" are intended to transmit signals and power between circuit sections without interference or slowdown. These include: • Metal 0/M0 (lowest layer): Local connections between transistors that are close to each other. • Metal 1 to Metal 15+ (higher grade): Longer, thicker lines for long-distance signal transmission. • Via (through-hole): Longitudinal connection between metal layers.
	Top metal layers	Used for power grid, clock distribution, and main signals. This layer provides stable power to the entire chip, synchronizes the timing of all transistors, and transmits big/fast signals.

The silicon wafer mentioned earlier is a large, round, thin silicon disc (usually 200mm, 300mm, or 450mm in diameter), made from high-grade pure silicon. Once finished, the wafer is cut into several small pieces, each called a die. The die is then thinned down to about 0.1–0.7 mm, becoming a silicon substrate – the core that contains the chip's true circuitry (as shown in the construction above).

During the chip manufacturing process, lithography (or lithography machine, often referred to as ASML's EUV/DUV) is the most important device, as shown by the use of ultraviolet light (UV or EUV) to "print" the circuit design from the mask to the photoresist coating on the wafer → deposition (deposition/doping to create a transistor, well/active layer, interconnect layer). This process is repeated 10–20 times to build each layer on top of each other (from the substrate → transistor layer → interconnect layers → top metal layers).

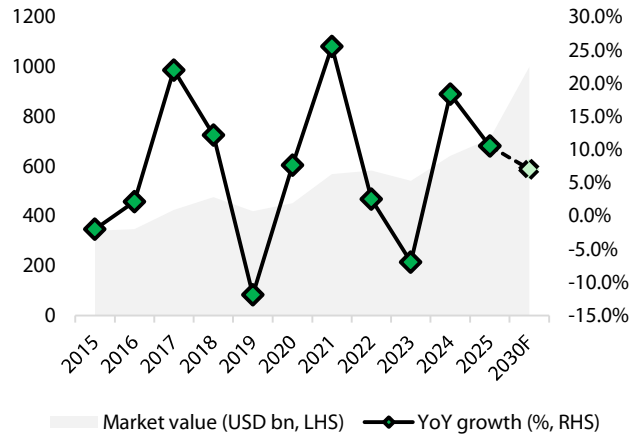
Source: Wikipedia, Intel, ResearchGate, RongViet Securities

The story of AI emerging as an application leading the growth of the global chip industry in the medium term with a focus on the US - China

The outlook for the chip manufacturing industry is closely tied to the semiconductor manufacturing industry as (1) 83.1% of global semiconductor production is applied to chip production (according to market.us), (2) die (the silicon core of the chip) is almost entirely composed of silicon atoms (extremely high purity).

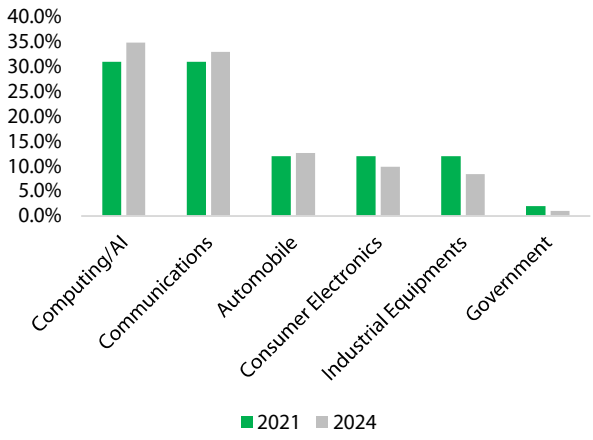
Currently, the demand for AI (data storage and processing in data centers) and the production of electronic devices (laptops, smartphones, tablets, etc.) are the biggest outputs for chips. Movements in these industries may affect the market value outlook of the semiconductor & chip industry.

Market value of the global semiconductor industry has grown explosively from the Covid-19 period, reaching 700 mn in 2025, expected to reach USD 1,000 mn in 2030, implying the expansion of the size of the chip market



Source: WSTS, RongViet Securities

The demand for AI data centers has emerged as a major driver of the growth of the semiconductor & chip industry (accounting for 33.0% of semiconductor production in use worldwide)



Source: WSTS, RongViet Securities

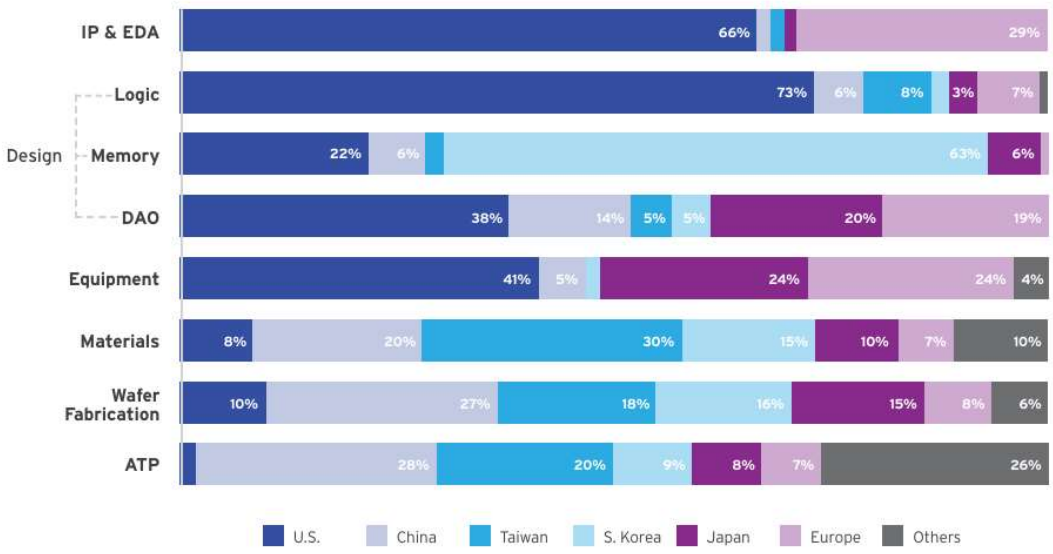
Huge demand from AI data centers and low inventories in chip manufacturers such as Samsung, SK Hynix, Micron, pushed the selling price of chips of all kinds (memory/processing chips) to increase sharply from Q3-2025, which is expected to continue for 2026.

Source: pcpartpicker, RongViet Securities

The quartet of the United States - China - Taiwan - South Korea are the names that control the global chip industry game, dividing the main roles in the global semiconductor industry value chain as shown below, implying that any geopolitical fluctuations related to this quartet will significantly affect the outlook for global chip production and prices.

In particular, the US controls core technologies in the chip industry such as IP & EDA, Design, Equipment, China-Taiwan-Korea controls chip industry inputs such as semiconductors, silicon wafers and test and assembly (ATP) outputs.

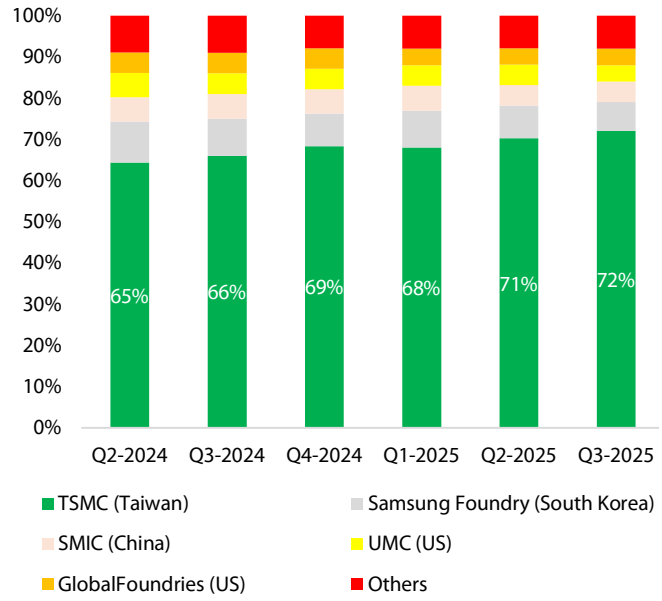
Chip industry value-added by sub-sector and region in 2024 (%)



Source: SIA, RongViet Securities. Annotate the stages in the table below

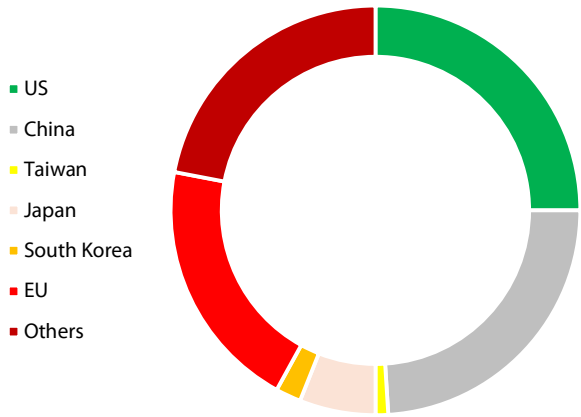
Stage	Details
IP & EDA (Intellectual Property & Electronic Design Automation):	IP is the available "core design blocks" (such as CPU cores, GPU cores, memory controllers) that the company can buy for use in its chips. EDA is a chip design software (tools such as Cadence, Synopsys for drawing circuit diagrams , simulations, and testing designs before production). This is the industry's first "brain" and creative tool.
Design	The stage of creating a complete chip design (blueprint). These include: • Logic: Chips that handle complex logic (CPU, GPU, SoC for phones/AI). • Memory: Memory chip (DRAM, NAND flash). • DAO (Discrete/Analog/Other): Analog chips, discrete (sensors, optoelectronics, analog-digital signal conversion) or others that are simpler.
Equipment	Machinery used to make chips on wafers (wafer fab equipment - WFE), such as lithography machines (ASML), etching, deposition.... This is the most expensive and high-end technology to "print" circuits on silicon.
Materials	Required raw materials and chemicals: pure silicon, photoresist, special gases, cleaning chemicals...
Wafer Fabrication (Wafer Molding - front-end manufacturing)	The main process of chip production: silicon wafer removal, coating, circuit printing with ultraviolet light, engraving, doping... to create millions of transistors on silicon disks (foundries such as TSMC, Samsung, SMIC).
ATP (Assembly, Test, Packaging - back-end)	The last stage: cutting the wafer into individual chips, assembling, testing, packaging into complete chips to be attached to the board (such as in phones and computers).

TSMC has a 72% share of the dedicated chip manufacturing market, supported by making the most of 4/5nm technology for AI GPUs and expanding CoWoS (Co-WoS) capabilities



Source: Counterpoint, RongViet Securities

The US & China share the top spot in terms of global chip consumption market share (%)



Source: AIR University on the article The Conflicting Economic and Security Imperatives of Semiconductor Supply-Chain Collaboration in the Indo-Pacific, RongViet Securities

DISCLAIMERS

This report is prepared in order to provide information and analysis to clients of Rong Viet Securities only. It is and should not be construed as an offer to sell or a solicitation of an offer to purchase any securities. No consideration has been given to the investment objectives, financial situation or particular needs of any specific. The readers should be aware that Rong Viet Securities may have a conflict of interest that can compromise the objectivity this research. This research is to be viewed by investors only as a source of reference when making investments. Investors are to take full responsibility of their own decisions. VDSC shall not be liable for any loss, damages, cost or expense incurring or arising from the use or reliance, either full or partial, of the information in this publication.

The opinions expressed in this research report reflect only the analyst's personal views of the subject securities or matters; and no part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendations or opinions expressed in the report.

The information herein is compiled by or arrived at Rong Viet Securities from sources believed to be reliable. We, however, do not guarantee its accuracy or completeness. Opinions, estimations and projections expressed in this report are deemed valid up to the date of publication of this report and can be subject to change without notice.

IMPORTANT DISCLOSURES FOR U.S. PERSONS

This research report was prepared by Viet Dragon Securities Corp. ("VDSC"), a company authorized to engage in securities activities in Vietnam. VDSC is not a registered broker-dealer in the United States and, therefore, is not subject to U.S. rules regarding the preparation of research reports and the independence of research analysts. This research report is provided for distribution to "major U.S. institutional investors" in reliance on the exemption from registration provided by Rule 15a-6 of the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act").

Additional Disclosures

This research report is for distribution only under such circumstances as may be permitted by applicable law. This research report has no regard to the specific investment objectives, financial situation or particular needs of any specific recipient, even if sent only to a single recipient. This research report is not guaranteed to be a complete statement or summary of any securities, markets, reports or developments referred to in this research report. Neither VDSC nor any of its directors, officers, employees or agents shall have any liability, however arising, for any error, inaccuracy or incompleteness of fact or opinion in this research report or lack of care in this research report's preparation or publication, or any losses or damages which may arise from the use of this research report.

VDSC may rely on information barriers, such as "Chinese Walls" to control the flow of information within the areas, units, divisions, groups, or affiliates of VDSC.

Investing in any non-U.S. securities or related financial instruments (including ADRs) discussed in this research report may present certain risks. The securities of non-U.S. issuers may not be registered with, or be subject to the regulations of, the U.S. Securities and Exchange Commission. Information on such non-U.S. securities or related financial instruments may be limited. Foreign companies may not be subject to audit and reporting standards and regulatory requirements comparable to those in effect within the United States.

The value of any investment or income from any securities or related financial instruments discussed in this research report denominated in a currency other than U.S. dollars is subject to exchange rate fluctuations that may have a positive or adverse effect on the value of or income from such securities or related financial instruments.

Past performance is not necessarily a guide to future performance and no representation or warranty, express or implied, is made by VDSC with respect to future performance. Income from investments may fluctuate. The price or value of the investments to which this research report relates, either directly or indirectly, may fall or rise against the interest of investors. Any recommendation or opinion contained in this research report may become outdated as a consequence of changes in the environment in which the issuer of the securities under analysis operates, in addition to changes in the estimates and forecasts, assumptions and valuation methodology used herein.

No part of the content of this research report may be copied, forwarded or duplicated in any form or by any means without the prior.

RESEARCH DISCLOSURES

Third Party Research

This is third party research. It was prepared by Rong Viet Securities Corporation (Rong Viet), with headquarters in Ho Chi Minh City, Vietnam. Rong Viet is authorized to engage in securities activities according to its domestic legislation. This research is not a product of Tellimer Markets, Inc., a U.S. registered broker-dealer. Rong Viet has sole control over the contents of this research report. Tellimer Markets, Inc. does not exercise any control over the contents of, or the views expressed in, research reports prepared by Rong Viet.

Rong Viet is not registered as a broker-dealer in the United States and, therefore, is not subject to U.S. rules regarding the preparation of research reports and the independence of research analysts. This research report is provided for distribution to "major U.S. institutional investors" and other "U.S. institutional investors" in reliance on the exemption from registration provided by Rule 15a-6 of the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act").

Any U.S. recipient of this research report wishing to effect any transaction to buy or sell securities or related financial instruments based on the information provided in this research report should do so only through Tellimer Markets, Inc., located at 575 Fifth Avenue, 27th Floor, New York, NY 10017. A representative of Tellimer Markets, Inc. is contactable on +1 (212) 551 3480. Under no circumstances should any U.S. recipient of this research report effect any transaction to buy or sell securities or related financial instruments through Rong Viet. Tellimer Markets, Inc. accepts responsibility for the contents of this research report, subject to the terms set out below, to the extent that it is delivered to a U.S. person other than a major U.S. institutional investor.

None of the materials provided in this report may be used, reproduced, or transmitted, in any form or by any means, electronic or mechanical, including recording or the use of any information storage and retrieval system, without written permission from.

Rong Viet is the employer of the research analyst(s) responsible for the content of this report and research analysts preparing this report are resident outside the U.S. and are not associated persons of any U.S. regulated broker-dealer. The analyst whose name appears in this research report is not registered or qualified as a research analyst with the Financial Industry Regulatory Authority ("FINRA") and may not be an associated person of Tellimer Markets, Inc. and, therefore, may not be subject to applicable restrictions under FINRA Rules on communications with a subject company, public appearances and trading securities held by a research analyst account.

Tellimer Markets, Inc. or its affiliates has not managed or co-managed a public offering of securities for the subject company in the past 12 months, has not received compensation for investment banking services from the subject company in the past 12 months, and does not expect to receive or intend to seek compensation for investment banking services from the subject company in the next three months. Tellimer Markets, Inc. has never owned any class of equity securities of the subject company. There are no other actual, or potential, material conflicts of interest of Tellimer Markets, Inc. at the time of the publication of this report. As of the publication of this report, Tellimer Markets, Inc. does not make a market in the subject securities.

About Tellimer

Tellimer is a registered trade mark of Exotix Partners LLP. Exotix Partners LLP and its subsidiaries ("Tellimer") provide specialist investment banking services to trading professionals in the wholesale markets. Tellimer draws together liquidity and matches buyers and sellers so that deals can be executed by its customers. Tellimer may at any time, hold a trading position in the securities and financial instruments discussed in this report. Tellimer has procedures in place to identify and manage any potential conflicts of interests that arise in connection with its research. A copy of Tellimer's conflict of interest policy is available at www.tellimer.com/regulatory-information.

Distribution

This report is not intended for distribution to the public and may not be reproduced, redistributed or published, in whole or in part, for any purpose without the written permission of Tellimer. Tellimer shall accept no liability whatsoever for the actions of third parties in this respect. This report is for distribution only under such circumstances as may be permitted by applicable law.

This report may not be used to create any financial instruments or products or any indices. Neither Tellimer, nor its members, directors, representatives, or employees accept any liability for any direct or consequential loss or damage arising out of the use of all or any part of the information herein.

United Kingdom: Distributed by Exotix Partners LLP only to Eligible Counterparties or Professional Clients (as defined in the FCA Handbook). The information herein does not apply to, and should not be relied upon by, Retail Clients (as defined in the FCA Handbook); neither the FCA's protection rules nor compensation scheme may be applied.

UAE: Distributed in the Dubai International Financial Centre by Exotix Partners LLP (Dubai) which is regulated by the Dubai Financial Services Authority ("DFSA"). Material is intended only for persons who meet the criteria for Professional Clients under the Rules of the DFSA and no other person should act upon it.

Other distribution: The distribution of this report in other jurisdictions may be restricted by law and persons into whose possession this document comes should inform themselves about, and observe, any such restriction.

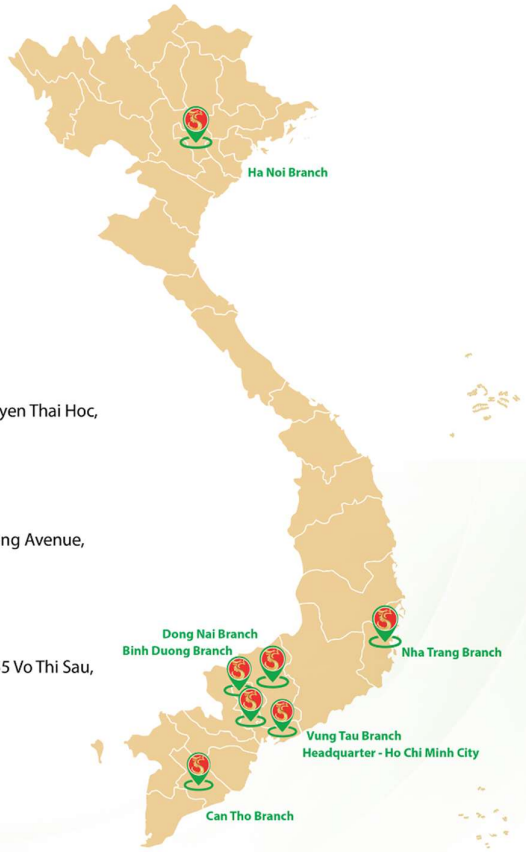
Disclaimers

Tellimer and/or its members, directors or employees may have interests, or long or short positions, and may at any time make purchases or sales as a principal or agent of the securities referred to herein. Tellimer may rely on information barriers, such as "Chinese Walls" to control the flow of information within the areas, units, divisions, groups of Tellimer.

Investing in any non-U.S. securities or related financial instruments (including ADRs) discussed in this report may present certain risks. The securities of non-U.S. issuers may not be registered with, or be subject to the regulations of, the U.S. Securities and Exchange Commission. Information on such non-U.S. securities or related financial instruments may be limited. Foreign companies may not be subject to audit and reporting standards and regulatory requirements comparable to those in effect within the United States. The value of any investment or income from any securities or related financial instruments discussed in this report denominated in a currency other than U.S. dollars is subject to exchange rate fluctuations that may have a positive or adverse effect on the value of or income from such securities or related financial instruments.

Frontier and Emerging Market laws and regulations governing investments in securities markets may not be sufficiently developed or may be subject to inconsistent or arbitrary interpretation or application. Frontier and Emerging Market securities are often not issued in physical form and registration of ownership may not be subject to a centralised system. Registration of ownership of certain types of securities may not be subject to standardised procedures and may even be effected on an ad hoc basis. The value of investments in Frontier and Emerging Market securities may also be affected by fluctuations in available currency rates and exchange control regulations. Not all of these or other risks associated with the relevant company, market or instrument which are the subject matter of the report are necessarily considered.

OPERATING NETWORK



HEADQUARTER IN HO CHI MINH CITY
1st floor to 8th floor, Viet Dragon Tower, 141 Nguyen Du, Ben Thanh Ward, Ho Chi Minh City
T (+84) 28 6299 2006 E info@vdsc.com.vn
W www.vdsc.com.vn Tax code 0304734965

HANOI BRANCH
10th floor, Eurowindow Tower, 02 Ton That Tung, Kim Lien Ward, Hanoi
T (+84) 24 6288 2006
F (+84) 24 6288 2008

NHA TRANG BRANCH
7th floor, Sacombank Tower, 76 Quang Trung, Nha Trang Ward, Khanh Hoa Province
T (+84) 25 8382 0006
F (+84) 25 8382 0008

CAN THO BRANCH
8th floor, Sacombank Tower, 95-97-99 Vo Van Tan, Ninh Kieu Ward, Can Tho City
T (+84) 29 2381 7578
F (+84) 29 2381 8387

VUNG TAU BRANCH
2nd floor, VCCI Building Tower, 155 Nguyen Thai Hoc, Tam Thang Ward, Ho Chi Minh City
T (+84) 25 4777 2006

BINH DUONG BRANCH
3rd floor, Becamex Tower, 230 Binh Duong Avenue, Phu Loi Ward, Ho Chi Minh City
T (+84) 27 4777 2006

DONG NAI BRANCH
8th floor, TTC Plaza Building Tower, 53-55 Vo Thi Sau, Tran Bien Ward, Dong Nai Province
T (+84) 25 1777 2006

BEST INVESTMENT RESEARCH VIETNAM 2025
GLOBAL BANKING & FINANCE AWARDS