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Research on the Evolution of China-Germany Trade Relations and Countermeasures Against Technical Measures to Trade

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Abstract: As China's most important trading partner in the European Union (EU), Germany has long accounted for more than one-third of the total China-EU trade volume. Its cooperation with China in high-end manufacturing, automotive, chemical, new energy and other fields is deeply bound to the global industrial chain. With the formal inauguration of Germany's new Chancellor, Friedrich Merz, his policy focus has continued the "pragmatism" tone while incorporating new considerations on issues such as supply chain security, green transformation, and technological competition. This has led to the gradual emergence of differentiated demands in the technical field within the framework of stable cooperation in China-Germany trade relations. Technical Barriers to Trade (TBT), as a policy tool with strong concealment and wide-ranging impact, has become one of the core areas of the game and coordination between the two sides. Based on international trade theory and the analytical framework of technical trade barriers, this paper systematically sorts out the core orientation of the new German government's trade policy and its impact on China-Germany trade relations, deeply analyzes the main manifestations and mechanism of action of Germany's technical trade measures, and accordingly proposes countermeasures including deepening rule dialogue, accelerating standard alignment, strengthening industrial upgrading, and utilizing multilateral mechanisms. It aims to provide theoretical reference and policy suggestions for building a defensive technical trade measure system adapted to the new situation of China-Germany trade.

Keywords: China-Germany trade; Technical trade measures; Countermeasures

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1. Introduction

Against the backdrop of major adjustments in the global economic pattern and persistent geopolitical tensions, China-Germany trade relations have become a key link connecting China and Europe, currently facing an unprecedentedly complex situation. Germany has remained China's top trading partner in the EU for many consecutive years. Customs statistics show that the total bilateral goods trade volume reached 1.510595 trillion

yuan in 2025, accounting for 6% of the national import and export total in the same period and approximately a quarter (i.e., 25.49%) of the total China-EU trade volume. The two countries have carried out in-depth cooperation in high-end manufacturing, automotive industry, chemical products, new energy technology and other fields, not only forming a mutually beneficial and win-win development model but also significantly enhancing their core competitiveness in the global industrial chain and supply chain [1,2].

In 2025, after the formal inauguration of Germany's new Chancellor, Friedrich Merz, his economic and trade policy towards China has shown new characteristics. On the one hand, the government still maintains the pragmatic cooperation tone of the Merkel era, emphasizing the importance of China-Germany economic ties for enterprise development. On the other hand, it has gradually integrated concepts such as "strategic autonomy", "supply chain security", and "technological sovereignty" into the top-level design, and actively built a risk management-oriented technical exchange mechanism. The model of "cooperation coexisting with competition" has profoundly affected the bilateral trade pattern, and "Technical Barriers to Trade (TBT)" has become one of the key links in the game between the two sides.

Compared with traditional tariff barriers, technical trade measures are difficult to be directly classified as unfair trade practices under the WTO framework due to their concealment and "legitimate" label. According to statistics, the number of various technical trade measures issued globally in the past ten years has exceeded that of other types, such as anti-dumping and countervailing by nearly 80 times. Roberto Azevêdo, former Director-General of the WTO, also stated that such non-tariff barriers have a negative impact on developing economies that is about 219% higher than ordinary tariffs, and their hazards cannot be underestimated [4,5].

2. Core orientation of the new German government's trade policy and new characteristics of China-Germany trade relations

After the new German Chancellor took office, he re -planned the direction of trade policy based on the concept of "strategic autonomy". On the one hand, striving to maintain the existing achievements of cooperation between China and Germany in traditional fields such as automobile manufacturing and chemical industry; on the other hand, striving to shape technical cooperation boundaries to ensure controllability [6,7]. This layout of both cooperation and prevention has significantly changed the development direction of the economic and trade relations between the two countries. In practice, the main guidelines of the current German government for foreign trade affairs are reflected in the following three key characteristics.

2.1. Prominent characteristics of "stabilizing tradition and restricting high-end" in trade cooperation

From the perspective of cooperation, the complementarity of China-Germany traditional manufacturing industries has been continuously enhanced. German automakers such as Volkswagen and BMW have accelerated their layout in China's new energy vehicle industry, and the construction of BASF Zhanjiang Integrated Base has continued to advance. According to GTAI statistics, the trade volume of auto parts between China and Germany increased by 8.2% year-on-year in the first half of 2025, and the trade volume of chemical products increased by 6.5% year-on-year. From the above data, it can be seen that German enterprises still value the importance of the Chinese market in core industries, and the basic pattern of China-Germany economic and trade relations has not changed.

In the field of high-tech industries, the German federal government has begun to build "invisible barriers". For the export of core products such as semiconductor manufacturing equipment, industrial software, and

precision CNC machine tools to the Chinese market, a new "national security review" procedure has been added, requiring enterprises to provide detailed explanations of technical application backgrounds. Statistics released by the German Federal Ministry for Economic Affairs and Climate Action show that during the second quarter of 2025, the approval time for relevant products was nearly 30% longer than that in the first quarter, and the approval rate for certain high-end models dropped to 65%, a decrease of 18 percentage points from before.

2.2. "Green standards" become a new starting point for trade access

The new German government has deeply integrated the "carbon neutrality" goal into trade policy, promoting the formation of green technical trade measures centered on "carbon footprint". In April 2025, the German Federal Ministry for Economic Affairs and Climate Action issued the *Guidelines for Carbon Footprint Accounting of Imported Products*, requiring imported products such as steel, cement, and photovoltaic modules to provide full-life-cycle carbon footprint reports, and plans to extend this requirement to the automotive and electronic equipment fields starting from 2026.

As a major exporter of photovoltaic modules and steel products to Germany, Chinese-related enterprises are facing a severe test of a significant increase in carbon emission verification costs. According to industry research data, photovoltaic module manufacturers need to spend about 2 million yuan to purchase specialized testing equipment to meet the carbon footprint disclosure requirements, which increases the comprehensive cost of their export products by 3% to 5%. For some small and medium-sized enterprises, this cost increase may even make them lose the ability to participate in trade competition in the German market. In the long run, the global supply chain structure may undergo profound changes due to the impact of carbon footprint management policies, and there is a possibility that certain production links will shift to regions that meet low-carbon certification standards.

2.3. Upgraded cooperation restrictions under the concept of "technological sovereignty"

The German government has released a "technological sovereignty" strategy, aiming to reduce the dependence of key technologies on a single country [8,9]. In cutting-edge technological fields such as artificial intelligence, quantum technology, and Industry 4.0, it has suspended cooperative R&D projects between domestic scientific research institutions and Chinese enterprises, terminating three Sino-German co-built artificial intelligence laboratories by the first half of 2025. Conversely, it has formulated the *Technical Export Control List* through industry associations, including 12 categories of high-end industrial software and 8 types of precision sensors into strict supervision, implementing more stringent control measures.

3. Main manifestations and impact mechanism of technical trade measures of the new German government

Compared with the direct intervention nature of traditional tariff policies, the technical trade barrier measures implemented by the new German government emphasize "legitimacy" and "concealment", and gradually establish a multi-level market access control system through standardization formulation, product certification, technical evaluation and other methods. Such measures are often under the guise of "technical neutrality" and are difficult to be identified as obviously trade-discriminatory under the WTO rule framework [10,11]. Their main characteristics are reflected in the following points.

3.1. Setting "invisible thresholds" relying on discourse power in international standards

With its core position in the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), Germany has led the formulation and promotion of many globally influential industry standards. After the new government took office, local technical institutions (DIN, VDE) have further promoted the integration of elements such as "technical safety" and "data privacy protection" into international general norms.

3.2. Strengthening the targeted nature of conformity assessment procedures through "compliance review"

To enhance the competitive advantage of its domestic automotive industry in the world market, Germany has implemented differentiated conformity assessment policies for export enterprises from China. In particular, the *Regulations on Market Access for Electric Vehicles* that came into effect in May 2025 has added many mandatory requirements. For example, documents such as "technical evaluation report on battery thermal runaway protection" and "information security audit certificate for autonomous driving systems" must be certified by qualified local institutions (such as TÜV Rheinland), and the cost of these certifications is about 40% higher than that of traditional international testing procedures.

3.3. Restricting technical cooperation and product imports through "supply chain review"

To ensure "supply chain security", the German government has issued the *Regulations on Critical Supply Chain Review*, conducting traceability reviews on imported goods in core fields such as energy, communications, and medical care. In June 2025, the German Federal Ministry for Economic Affairs conducted a special inspection on photovoltaic inverters imported from China, requiring enterprises to provide complete supply chain information from chips to casings and prohibiting the use of components produced in regions sanctioned by the EU.

4. Strategic suggestions for China to respond to changes in Germany's technical trade measures

In response to the latest developments in the German government's technical trade policies, China should adopt an overall strategy of "proactive defense, active communication, and internal and external linkage", forming a comprehensive technical trade barrier response system in terms of rule-making, standard alignment, and industrial transformation, so as to maintain the overall stability of the overall situation of China-Germany economic and trade cooperation and effectively safeguard the fundamental interests of key domestic industries [12,13]. Specific countermeasures and suggestions are as follows.

4.1. Deepen China-Germany dialogue on technical trade rules and proactively participate in international standard setting

A structured multi-party collaborative dialogue mechanism should be established between the German Federal Ministry for Economic Affairs and Climate Action, the German Institute for Standardization, and the VDE Association for Electrical, Electronic & Information Technologies, with a focus on key areas such as carbon footprint assessment, industrial information security, and new energy vehicle market access. Through regular thematic consultations, technical working groups, and special seminars, stakeholders can promote alignment in standard formulation and certification procedures, thereby effectively mitigating the impact of technical trade barriers on

enterprise operations. An "early warning" function should be embedded within this consultation framework, enabling timely policy communication and advance notification when the German side intends to introduce new technical trade measures, so as to prevent abrupt regulatory shocks and reduce operational risks for enterprises.

At the same time, strengthened cooperation between Chinese institutions and German standardization bodies should be leveraged to jointly advance international standard-setting processes within platforms such as the International Organization for Standardization and the International Electrotechnical Commission, particularly in emerging fields including new energy, artificial intelligence, and digital trade. In the photovoltaic sector, efforts should be made to incorporate Chinese enterprises' "green power production" accounting methodologies into international carbon footprint standards, while encouraging Germany to refine its domestic policies to ensure fair and technology-neutral evaluation, thereby minimizing adverse impacts on exports. Furthermore, in the domain of the industrial Internet, both sides should accelerate the standardization of mutual recognition mechanisms for cross-border data transmission security certification, significantly improving market access conditions for Chinese equipment and fostering deeper industrial cooperation.

4.2. Accelerate the alignment of domestic standards with German and international standards and promote certification mutual recognition

For key China-Germany trade fields such as automobiles, chemicals, medical devices, and new energy, conduct technical difference analysis and research between Chinese National Standards (GB), German National Standards (DIN), and EU Harmonized Standards (EN), evaluate the equivalence of core parameters, and form a "list of standard equivalence recognition". For those with technical indicators superior to or equal to China's current standards, strive for German recognition to reduce repeated testing and certification costs due to standardization differences.

Further strengthen cooperation with the China National Accreditation Service for Conformity Assessment (CNAS), and strive to build a mutual recognition mechanism for test reports in key fields such as photovoltaic modules, electric vehicle batteries, and medical devices, effectively reducing the waste of resources by Chinese enterprises in repeated inspections. Through cooperation agreements between certification institutions, carbon footprint assessment certificates issued by China's TÜV SÜD or SGS can be officially adopted by the German Federal Ministry for Economic Affairs and Climate Action, avoiding secondary re-inspection in local laboratories.

4.3. Strengthen industrial technological upgrading and supply chain resilience to build a defensive industrial foundation

In response to the German government's export restriction policies on core fields such as semiconductor equipment, industrial software, and precision sensors, domestic enterprises need to strengthen independent innovation capabilities and accelerate the process of independent control of key technologies. In the field of semiconductor manufacturing equipment, focus on breaking through key technical difficulties in advanced processes below 28 nanometers, and gradually reduce technical dependence on external suppliers (such as ASML). In terms of industrial design and simulation tools, domestic enterprises can jointly develop application systems that meet German Industry 4.0 standards through cooperation platforms with internationally renowned automakers, improving competitiveness in the domestic market and expanding overseas markets [13].

It is recommended that Chinese enterprises adopt a model combining "overseas warehousing centers + localized manufacturing bases" in their overseas layout in Germany and surrounding Central and Eastern European regions [14]. The photovoltaic industry can first establish component assembly plants in Hamburg to meet

carbon emission standards using local supply chain resources; the auto parts industry can accelerate the expansion of production capacity in Hungary, the Czech Republic and other places to avoid technical trade barriers faced by whole vehicle imports and further release the growth potential of the European market. Moreover, establish a China-Germany cross-border trade risk early warning platform to real-time monitor the updated dynamics of German technical regulations, provide policy interpretation and compliance guidance services for enterprises, and help enterprises prevent operational risks in advance.

4.4. Utilize multilateral mechanisms to safeguard trade interests and offset unilateral technical trade barriers

A more proactive use should be made of multilateral mechanisms under the World Trade Organization, particularly the WTO Committee on Technical Barriers to Trade and the Trade Policy Review Mechanism, to scrutinize Germany's potentially improper technical trade measures. Through these platforms, China can formally raise concerns, promote compliance reviews, and urge the removal of provisions that may constitute de facto discrimination. At the same time, domestic enterprises should be encouraged and supported to actively participate in the Specific Trade Concerns framework by providing evidence-based feedback on German practices that may violate core WTO principles such as most-favored-nation treatment, thereby strengthening the protection of their legitimate rights and interests through institutional channels.

In parallel, the issue of China-Germany technical trade measures should be elevated to a central position within broader China-EU economic governance frameworks, including the China-EU High-Level Economic and Trade Dialogue and follow-up negotiations related to the Comprehensive Agreement on Investment. By embedding these concerns into high-level dialogue, China can encourage the European Union to enhance coordination and discipline over the formulation and implementation of technical trade measures among its member states, thereby reducing the risk of unilateral or fragmented regulatory actions by individual countries such as Germany. In practical terms, both sides should work toward harmonizing carbon footprint accounting standards at the EU level to prevent regulatory divergence and lower compliance costs for Chinese enterprises. Furthermore, advancing the establishment of a "mutual recognition mechanism for technical security reviews" would help eliminate redundant inspections of identical products, improve regulatory efficiency, and significantly facilitate bilateral trade.

5. Conclusion

This paper systematically analyzes the evolution of technical trade measures and their impact on China-Germany trade relations after the new German government took office. The new German government's trade policy shows three characteristics: "stabilizing tradition and restricting high-end", "green standards", and "technological sovereignty". As a policy tool with strong concealment, technical trade measures are gradually becoming an important means for the German government to achieve its policy goals. Germany has built a multi-level trade access barrier through standard formulation, refinement of conformity assessment procedures, and supply chain reviews, which has had a significant impact on Chinese export enterprises. In response to the continuous evolution of Germany's technical trade barriers, China urgently needs to form a systematic response mechanism. In terms of policies, it is necessary to deepen the consultation and cooperation model of China-Germany technical trade rules and enhance participation in global standard setting; in the field of standardization, accelerate the alignment of domestic standards with international norms and gradually improve the certification mutual recognition agreement

system; from an industrial perspective, focus on improving core technological innovation capabilities and optimizing supply chain resilience layout; and actively safeguard its legitimate rights and interests in multilateral platforms such as the WTO and relevant regional cooperation mechanisms. Through the above comprehensive measures, form a technical trade prevention network that conforms to the characteristics of bilateral economic and trade relations in the new era.

Disclosure statement

The author declares no conflict of interest.

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