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STRATEGIC PATHWAYS FOR DISRUPTIVE INNOVATION
IN NEV LATECOMER FIRMS:
THE INTERPLAY OF INSTITUTIONAL COMPLEXITY AND RESOURCE BRICOLAGE

For citation: Wang M., Kokarēviča A. (2026) Strategic pathways for disruptive innovation in NEV latecomer firms: The interplay of institutional complexity and resource bricolage. *Sociālo Zinātņu Vēstnesis = Social Sciences Bulletin*, 42(1), 40–54. [https://doi.org/10.59893/szv.2026.1\(3\)](https://doi.org/10.59893/szv.2026.1(3))

This article examines how new energy vehicle (NEV) latecomer firms can pursue disruptive innovation under institutional complexity and resource constraints. The study argues that late entry does not necessarily mean permanent strategic weakness. In the NEV sector, technological discontinuity, environmental regulation, industrial policy, infrastructure development and changing demand may weaken some incumbent advantages and create opportunities for firms without a full traditional automotive resource base. The article develops a conceptual framework linking disruptive innovation, latecomer catch-up, institutional complexity, resource bricolage and dynamic capabilities. Methodologically, it applies a structured conceptual review: academic literature is used to clarify theoretical mechanisms, while institutional sources describe the sectoral and regulatory context. The central result is a pathway model showing how institutional complexity creates both pressure and opportunity windows, how resource bricolage enables firms to recombine available resources, and how dynamic capabilities help transform temporary experiments into scalable routines. Five strategic pathways are identified: affordability-based disruption, modular product recombination, policy-window acceleration, ecosystem-based service innovation and outward adaptation under regulatory and trade pressure. The article stresses that not every successful or fast-growing NEV firm is disruptive. Disruption occurs only when a firm changes market access, affordability, user practices or competitive expectations. The theoretical contribution is the integration of several research streams into one model explaining how latecomer firms may convert institutional pressure and resource scarcity into market-changing innovation. The practical contribution concerns managers and policymakers: firms should focus on underserved users, policy timing, resource recombination, partnerships and capability development, while policymakers should support learning, standards, infrastructure, supplier upgrading and fair competition.

Keywords: new energy vehicles, latecomer firms, disruptive innovation, institutional complexity, resource bricolage.

**Disruptīvās inovācijas stratēģiskie ceļi jauno enerģijas transportlīdzekļu vēlēto ienācēju uzņēmumos:
institucionālās sarežģītības un resursu brikolāžas mijiedarbība**

Šajā rakstā analizēts, kā jauno enerģijas transportlīdzekļu (NEV) nozares vēlēto ienācēju uzņēmumi var īstenot disruptīvo inovāciju institucionālās sarežģītības un resursu ierobežojumu apstākļos. Pētījumā pamatots, ka vēlēto ienākšana tirgū ne vienmēr nozīmē pastāvīgu stratēģisku vājumu. NEV nozarē tehnoloģiskā pārtrauce, vides regulējums, industriālā politika, infrastruktūras attīstība un mainīgs pieprasījums var mazināt daļu no tradicionālo uzņēmumu priekšrocībām un radīt iespējas uzņēmumiem, kuriem nav pilna tradicionālās autobūves resursu bāze. Rakstā izstrādāts konceptuāls ietvars, kas sasaista disruptīvo inovāciju, vēlēto ienācēju panākšanas stratēģijas, institucionālo sarežģītību, resursu brikolāžu un dinamiskās spējas. Metodoloģiski pētījumā izmantots strukturēts konceptuāls pārskats: akadēmiskā literatūra izmantota teorētisko mehānismu skaidrošanai, savukārt institucionālie avoti raksturo nozares un regulatīvo kontekstu. Galvenais rezultāts ir stratēģisko ceļu modelis, kas parāda, kā institucionālā sarežģītība rada gan spiedienu, gan iespēju logus, kā resursu brikolāža ļauj uzņēmumiem pārkombinēt pieejamos resursus un kā dinamiskās spējas palīdz pagaidu eksperimentus pārvērst mērogojamās rutīnās. Rakstā identificēti pieci stratēģiskie ceļi: uz pieejamību balstīta disruptīvā inovācija, modulāra produktu pārkombinēšana, politikas iespēju logu izmantošana, uz ekosistēmu balstīta pakalpojumu inovācija un ārējā adaptācija regulatīvā un tirdzniecības spiediena apstākļos. Rakstā uzsvērts, ka ne katrs veiksmīgs vai strauji augošs NEV uzņēmums ir disruptīvs. Disruptīvā inovācija rodas tikai tad, ja uzņēmums maina tirgus pieejamību, cenu pieejamību, lietotāju praksi vai konkurences gaidas. Teorētiskais ieguldījums ir vairāku pētniecības virzienu integrācija vienā modelī, kas skaidro, kā vēlēto ienācēju uzņēmumi var pārvērst institucionālo spiedienu un resursu trūkumu tirgu mainošā inovācijā. Praktiskais ieguldījums attiecas uz vadītājiem un politikas veidotājiem: uzņēmumiem jākoncentrējas uz nepietiekami apkalpotiem lietotājiem, politikas laika izvēli, resursu pārkombinēšanu, partnerībām un spēju attīstību, savukārt politikas veidotājiem jāatbalsta mācīšanās, standarti, infrastruktūra, piegādātāju attīstība un godīga konkurence.

Atslēgvārdi: jauno enerģijas transportlīdzekļu nozare, vēlēto ienācēju uzņēmumi, disruptīvā inovācija, institucionālā sarežģītība, resursu brikolāža.

Introduction

The new energy vehicle sector has become a major field of industrial competition because it combines technological change, climate policy, state regulation, infrastructure development and new consumer expectations. In this article, new energy vehicles, or NEVs, are understood mainly in the Chinese policy sense and include battery electric vehicles, plug-in hybrid vehicles and fuel-cell vehicles. The sector is not limited to vehicle production. It also includes batteries, charging systems, software, data, subsidies, supply chains and mobility services. Therefore, NEV development should be analysed not only as a technological shift, but also as an economic and institutional transformation.

In simple terms, this means that the NEV sector is not only about replacing petrol cars with electric cars. It is also about changing the way vehicles are produced, sold, used, charged and regulated. A car producer in this sector must work with battery suppliers, software developers, charging operators, local authorities, data rules and environmental standards. For this reason, competition in the NEV sector is broader than traditional automobile competition.

The scale of this transformation is already significant. According to the International Energy Agency, global electric car sales exceeded 17 million units in 2024, while China accounted for more than 11 million electric car sales and almost half of all car sales in the country (IEA 2025). These figures show that the NEV sector is no longer a peripheral market. It has become one of the central arenas in which firms, states and supply chains compete for technological leadership, market access and regulatory legitimacy.

This article focuses on NEV latecomer firms. A latecomer firm enters an industry after established competitors have already accumulated technological capabilities, brands, supplier networks, production routines and market legitimacy. In the automobile industry, these barriers are especially high because firms must combine capital-intensive production, safety certification, reliable supply chains, service networks and consumer trust. Latecomer firms therefore face structural disadvantages, but they may also benefit from periods of technological discontinuity, when older advantages lose part of their strategic value (Hobday 1995).

The term “latecomer firm” is used here in a practical sense. It does not simply mean a young firm. It means a firm that enters the market after stronger competitors have already created brands, technologies, production systems and customer trust. Such a firm usually starts from a weaker position. However, it may still find an opportunity when the industry itself is changing and when older advantages become less decisive.

The transition from internal combustion engines to electric drivetrains, batteries, software-defined vehicles and digital mobility services creates such a discontinuity. Firms that were weak in traditional engine technology may become competitive in battery integration, modular production, software functions, digital interfaces, charging solutions or new service models. This makes the NEV sector relevant for the study of disruptive innovation. Disruptive innovation should not be understood as any radical technology or any successful product. It refers to innovation that changes market access, affordability, user practice or competitive expectations, often by serving overlooked or price-sensitive users before challenging incumbent firms (Christensen et al. 2015).

This distinction is important because the word “disruptive” is often used too broadly. In this article, a product is not called disruptive only because it is new, digital or technologically advanced. It is disruptive only when it changes the conditions of market access. For example, disruption may occur when electric mobility becomes affordable for buyers who previously could not enter this market, or when a service model changes the way users obtain, charge or maintain a vehicle.

The strategic problem is that latecomer firms do not operate in a simple market environment. They face institutional complexity. NEV firms must respond simultaneously to industrial policy, environmental regulation, safety standards, battery rules, data and cybersecurity requirements, local

government priorities, consumer protection, trade restrictions and investor expectations. These pressures may support growth in one context and restrict it in another. Institutional complexity therefore creates both constraints and opportunity windows (Greenwood et al. 2011).

Institutional complexity means that a firm has to follow several types of rules and expectations at the same time. Some of them help the firm, for example subsidies, infrastructure programmes or environmental policy. Others may limit the firm, for example safety standards, data rules, trade barriers or certification requirements. The same institutional environment can therefore create both support and pressure.

Resource constraints are the second part of the problem. NEV latecomer firms often lack the full resource base of established automotive incumbents. However, this does not mean that they can only imitate. Resource bricolage allows firms to recombine available resources, including supplier relations, local industrial clusters, production capacity, digital sales channels, user data, policy support and partnerships, in order to create new solutions under constraint (Baker, Nelson 2005; Senyard et al. 2014). Bricolage alone is not enough, because vehicles require safety, reliability, integration and service support. It must therefore be connected with dynamic capabilities that allow firms to scale, stabilize and adapt their initial experiments (Teece et al. 1997; Teece 2018).

The term “resource bricolage” may sound abstract, but its meaning is simple. It describes a situation in which a firm builds something useful from the resources that are already available. A latecomer firm may not have its own complete technology base, but it may combine supplier components, local production capacity, digital channels, partnerships and user feedback. In this way, limited resources do not disappear, but they can be used more creatively.

The research gap addressed in this article is that disruptive innovation, latecomer catch-up, institutional complexity and resource bricolage are often analysed separately. This separation is insufficient for the NEV sector, where technological change, policy windows, resource limitations and market formation interact directly. Existing research on the Chinese electric vehicle industry shows that catch-up depends on the interaction between technology, policy and market-demand windows (Xiong et al. 2022). However, there is still a need for a clearer conceptual explanation of how latecomer firms convert these windows and constraints into strategic pathways of disruptive innovation.

This article does not aim to prove the commercial effectiveness of particular NEV firms or to classify individual companies as disruptive. Its purpose is narrower and conceptual: to develop a model explaining the conditions under which latecomer firms may transform institutional pressure and resource scarcity into pathways of disruptive innovation.

The aim of this article is to develop a conceptual framework explaining how NEV latecomer firms can pursue disruptive innovation under institutional complexity and resource constraints. The article addresses three research questions: what distinguishes NEV latecomer firms from established automotive incumbents; how institutional complexity and resource bricolage shape the possibility of disruptive innovation; and which strategic pathways allow latecomer firms to move from resource weakness to market-changing innovation. The contribution of the article is the development of a pathway model that links institutional pressure, resource recombination, dynamic capabilities and disruptive outcomes in the NEV sector.

Literature review

The literature on disruptive innovation is relevant to the NEV sector only if the concept is used narrowly. Disruption is not identical to technological novelty, fast growth or market success. It refers to changes in market access, affordability, user practice or competitive expectations, often beginning with overlooked or price-sensitive users before moving toward the mainstream (Christensen 1997; Christensen et al. 2015). This distinction is important because many electric vehicles are

technologically advanced, but not necessarily disruptive. In the NEV sector, stronger disruptive potential may be connected with affordable models, battery-swapping solutions, direct digital sales, low-cost platforms or service ecosystems that change access to electric mobility.

For this reason, disruptive innovation should be separated from ordinary technological improvement. A technologically better product may still serve the same customers in the same way. In that case, it improves the existing market but does not change its structure. A disruptive product or model changes the basis of competition: price, access, convenience, service logic or user groups.

However, disruptive innovation theory alone is not sufficient for explaining NEV latecomer firms. It clarifies how incumbents may be challenged by new value propositions, but it does not fully explain how firms without mature production routines, strong brands, supplier credibility and regulatory legitimacy can create such propositions. Later studies show that disruptive potential depends on demand conditions, customer preferences, business-model change and architectural recombination (Adner 2002; Henderson, Clark 1990; Markides 2006). This is especially relevant to NEVs, where the product combines batteries, software, charging infrastructure, digital interfaces, data functions and mobility services. Disruption may therefore emerge from a new configuration of price, architecture, service and access rather than from one radical component.

Latecomer-firm research adds the problem of structural disadvantage. Latecomer firms enter after incumbents have accumulated technological capabilities, brands, supplier networks, production routines and market legitimacy. In the automotive industry, this disadvantage is reinforced by high capital intensity, certification, safety requirements, supply-chain reliability, service networks and consumer trust. Simple imitation is therefore insufficient. Latecomers must search for entry points where incumbent advantages are weakened by technological discontinuity or institutional change (Hobday 1995).

In practical terms, this means that latecomer firms cannot usually win by copying incumbents step by step. If they follow the same path as established producers, they will often remain behind them. Their strategic chance appears when they choose a different path: a cheaper product, a simpler architecture, a new service model, a specific user group or a market segment that incumbents do not treat as central.

Research on the Chinese electric vehicle industry shows that latecomer catch-up depends on external windows of opportunity. Policy evolution, technology windows and market-demand windows influenced the catch-up process in the Chinese electric vehicle industry (Xiong et al. 2022). This means that latecomer success in NEVs cannot be explained only by firm-level learning. It depends on the interaction between technological discontinuity, demand formation, policy support, infrastructure development and market timing. For this reason, latecomer theory has to be linked with institutional analysis.

Institutional complexity is central because NEV firms operate under several institutional logics at the same time. Environmental policy promotes low-carbon mobility; industrial policy supports domestic upgrading; market logic requires price competitiveness; safety regulation demands reliability; data rules shape digital functions; and geopolitical pressure affects international expansion. These logics may support each other, but they may also conflict (Oliver 1991; Greenwood et al. 2011). The European Commission's 2024 countervailing duties on battery electric vehicles from China show how institutional complexity can directly change the economic conditions of internationalization (European Commission 2024). At the same time, China's New Energy Vehicle Industry Development Plan (2021–2035) illustrates how policy can also create strategic opportunity windows for infrastructure, technological upgrading and industrial coordination (State Council of the People's Republic of China 2020).

This dual role of institutions is important. Institutional complexity creates constraints, but it may also open temporary opportunities. Policy support can reduce uncertainty and accelerate learning, but

it can also create dependency if firms innovate mainly for subsidies or administrative targets. Therefore, institutions do not automatically produce disruptive innovation. They create conditions that latecomer firms must translate into strategic action.

Resource bricolage explains how such action may begin under resource constraints. Latecomer firms often cannot wait until they possess the full resource base of established automotive incumbents. They have to recombine available resources: suppliers, modular platforms, local industrial clusters, shared production capacity, digital channels, user data, partnerships and policy support (Baker, Nelson 2005; Senyard et al. 2014). In this sense, bricolage explains how resource weakness can become a source of experimentation rather than only a barrier.

Yet bricolage is not enough. In the NEV sector, improvisation may reduce costs and speed up entry, but it can also create fragmented systems, supplier dependence, weak quality control and unstable product architecture. Vehicles require safety, reliability, integration, after-sales service and regulatory compliance. Therefore, bricolage must be connected with dynamic capabilities. Dynamic capabilities explain how firms sense opportunities, seize them and reconfigure resources when the environment changes (Teece et al. 1997; Teece 2018). In this article, bricolage explains the start of strategic experimentation, while dynamic capabilities explain the transition from temporary recombination to scalable routines and competitive positions.

Dynamic capabilities can also be explained in simpler terms. They are the firm's ability to learn, adjust and reorganize its resources when the environment changes. For a NEV latecomer firm, this may include the ability to change suppliers, improve quality control, adapt software functions, redesign the product platform, or enter a foreign market with different rules. Without such capabilities, bricolage may remain only a short-term improvisation.

Recent NEV-specific studies support this integrated view. Jin, Zhu (2024) examine disruptive technological innovation in China's NEV enterprises through the interaction between resource-focused actions and dynamic capabilities. Feng et al. (2024) show that disruptive innovation by latecomer firms has a configurational character. This means that there is no single path from resource scarcity to innovation. Different combinations of institutional conditions, resource recombination, technological architecture and capability development may lead to different disruptive outcomes.

The NEV sector therefore requires integration of several theoretical streams. Disruptive innovation theory explains changes in access and competition. Latecomer theory explains initial disadvantage. Institutional complexity explains policy, regulatory and trade pressures. Resource bricolage explains action under constraint. Dynamic capabilities explain scaling and stabilization. These mechanisms operate together in the NEV sector; none of them alone is sufficient.

Because the article uses several theoretical concepts, it is necessary to define them before moving to the model. This is especially important because the same terms are often used differently in innovation studies, management studies and industrial policy analysis. Table 1 therefore gives not only general meanings, but also the specific meanings used in this article.

To clarify how the main concepts are used in this article, Table 1 summarizes their analytical meaning.

Table 1

Key terms used in the article

Term	General meaning	Meaning in this article
NEV	New energy vehicle	Battery electric, plug-in hybrid and related low-carbon vehicle models used as the field of analysis
Latecomer firm	A firm that enters later than established competitors	A company that lacks incumbent advantages but may use new technologies, policies or business models to catch up

Disruptive innovation	Innovation that changes market access or competition	A path that makes mobility cheaper, simpler, more accessible or more service-based for neglected or price-sensitive users
Institutional complexity	Coexistence of several rules, pressures and expectations	A situation where firms face policy support, regulation, safety standards, trade barriers and market expectations together
Resource bricolage	Creative use of available resources under constraint	Recombining existing suppliers, platforms, data, partnerships, policy support and production capabilities to build innovation despite constraints
Dynamic capabilities	The ability of a firm to adapt and reconfigure resources	The capability that helps latecomer firms move from improvised solutions to scalable and stable competitive models

Source: compiled by the authors based on the literature review.

Table 1 shows that NEV innovation is not treated here as a purely technical issue. The key problem is how latecomer firms may convert institutional pressure and resource scarcity into market-changing innovation. The reviewed literature explains separate parts of this process, but the NEV sector requires an integrated model linking institutional complexity, resource bricolage and disruptive innovation.

Research methodology

This article uses a structured conceptual review. The aim is not to test a statistical model, measure firm-level performance or prove the effectiveness of particular NEV companies. The aim is to develop an analytical framework explaining how NEV latecomer firms can pursue disruptive innovation under institutional complexity and resource constraints.

This methodological choice is appropriate because the article does not study one company, one national programme or one measurable performance outcome. It studies the logic of possible strategic pathways. Therefore, the main task is to compare concepts, clarify their meanings and show how they can be connected in one analytical framework.

The methodological logic follows the view that literature reviews can be used to organize knowledge and develop conceptual understanding (Snyder 2019). The article does not claim to be a full systematic review. It uses a transparent review procedure, but its purpose is conceptual synthesis rather than exhaustive bibliometric coverage (Tranfield et al. 2003; Torraco 2005).

The literature search was conducted in March–April 2026 through Scopus, Web of Science, Google Scholar and major publisher databases. The search used five groups of keywords: disruptive innovation and business-model disruption; latecomer firms, catch-up and Chinese electric vehicles; institutional complexity, industrial policy and regulatory pressure; resource bricolage and resource constraints; dynamic capabilities and strategic adaptation. Additional searches covered NEV firms, electric vehicles in China, EV policy and EU countervailing duties.

The initial search produced a broader pool of academic and institutional sources. These sources were then screened in several stages. First, duplicate and purely technical engineering publications were excluded. Second, sources that did not directly address one of the article’s core concepts were removed. Third, preference was given to publications that either defined the theoretical concepts used in the article or explained the NEV sector, latecomer catch-up, institutional pressure, policy windows, charging ecosystems or international regulatory constraints. As a result, the final evidence base included 31 sources: peer-reviewed journal articles, foundational monographs, methodological review papers and institutional documents.

The review combined foundational and recent literature. Classic sources were retained where they defined the main theoretical concepts. Recent publications from 2019–2026 were prioritized for NEV

development, Chinese electric vehicles, institutional pressure, international trade conditions, EV infrastructure and service ecosystems.

Sources were included if they explained one of the core concepts, were applicable to NEV latecomer firms, addressed electric vehicles or Chinese NEV development, or supported the review methodology. Sources were excluded if they focused only on technical engineering issues, provided only general market commentary, lacked clear bibliographic information, or could not be linked to the conceptual model.

Academic sources were used to develop theoretical mechanisms. Institutional sources, including the International Energy Agency, Chinese policy documents and European Union trade documents, were used only to describe the sectoral and regulatory context. They were not treated as evidence of causal mechanisms.

The analysis followed concept-driven synthesis. First, the main concepts were clarified. Second, the literature was grouped around mechanisms: institutional pressure and opportunity, resource-constrained action, capability development and latecomer value creation. Third, the selected sources were coded according to four analytical categories: institutional trigger, resource recombination, capability conversion and disruptive outcome. These categories were used to build the pathway model presented in the Results section.

In this article, a strategic pathway means an analytical pattern linking an institutional condition, a bricolage-based resource move, a capability-building mechanism and a possible disruptive innovation outcome. This approach makes it possible to move beyond a general discussion of latecomer firms and to specify how institutional complexity and resource constraints may be converted into different forms of market-changing innovation.

The absence of firm-level empirical testing is a deliberate methodological limitation rather than a weakness of design. At the current stage, the article seeks to build a conceptual framework that can later be tested through case studies, comparative firm analysis, patent data, product-platform analysis or internationalization research. Since disruptive innovation in NEV latecomer firms involves the interaction of technology, policy, resources, market access and institutional legitimacy, a conceptual synthesis is necessary before operational indicators can be selected for empirical testing.

The unit of analysis is therefore the strategic pathway, not the individual firm. The approach does not prove causality and does not test firm-level performance. It provides a conceptual framework for explaining how latecomer innovation may emerge under institutional pressure and resource limitation. The framework should therefore be read as a basis for future empirical research rather than as a final causal explanation.

This limitation should be made explicit. The article does not argue that every NEV latecomer firm will follow all five pathways. It also does not argue that all pathways are equally effective. The model is intended to show possible strategic mechanisms. These mechanisms can later be tested in case studies, comparative research or empirical analysis of firms, products and markets.

Results: strategic pathways for disruptive innovation

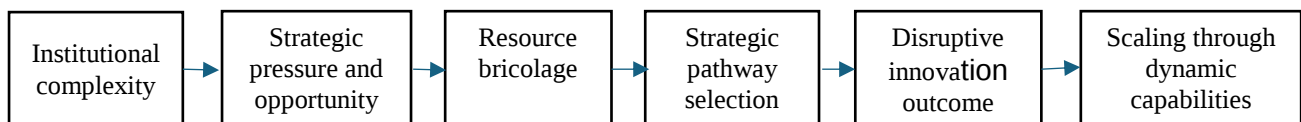
The review shows that disruptive innovation in NEV latecomer firms develops through the interaction of three elements: institutional complexity, resource bricolage and capability-based scaling. Institutional complexity creates pressure and opportunity windows. Resource bricolage allows latecomer firms to act before they possess the full resource base of established automobile producers. Dynamic capabilities help transform temporary recombination into repeatable routines, reliable products and scalable business models.

The central result of the analysis is a pathway model. It explains how latecomer firms may move from institutional pressure and resource constraints toward disruptive innovation. The model does not

present a statistically tested causal chain. It shows an analytical sequence in which institutional conditions create triggers, bricolage provides an operational response, and dynamic capabilities support the movement from experiment to scalable market offer.

Figure 1

Conceptual model of disruptive innovation pathways in NEV latecomer firms



Note: the model shows a logical sequence rather than a statistically tested causal chain. The arrows mean that one condition can enable the next stage when firm capabilities are sufficient.

Source: compiled by the authors.

Figure 1 shows that disruption is treated as a process rather than as a single technological event. A latecomer firm does not become disruptive only because it introduces a new technology. Disruptive potential appears when an institutional opening, a resource recombination and a scalable value proposition are connected in one strategic process.

Five main pathways can be distinguished. They are not mutually exclusive. A firm may combine several pathways, but each pathway has its own strategic logic. Table 2 links the institutional condition, the bricolage-based resource move and the possible disruptive result.

Table 2

Strategic pathways for disruptive innovation in NEV latecomer firms

Pathway	Institutional condition	Bricolage move	Disruptive result
Affordability-based disruption	Policy support and strong price-sensitive demand	Combine low-cost suppliers, simple design and modular production	NEVs become accessible to mass users who could not buy expensive electric cars
Modular product recombination	Fast technology change and open supplier networks	Recombine battery, software, sensor and platform modules from different sources	Firms shorten development cycles and compete through flexible product architecture
Policy-window acceleration	Subsidies, infrastructure plans, local industrial clusters and government procurement	Use policy resources together with local production and partnerships	Latecomers enter faster and learn through protected or supported market niches
Ecosystem-based service innovation	Digital platforms, charging infrastructure and data regulation	Use user data, software updates, mobile apps, leasing, charging and after-sales services	The vehicle becomes part of a service ecosystem, not only a manufactured product
Outward adaptation under pressure	Foreign tariffs, safety rules, local-content demands and geopolitical scrutiny	Adapt models, partnerships and production locations to foreign institutional conditions	Latecomers move from simple export to more localized international business models

Source: compiled by the authors.

Table 2 shows that institutional complexity and resource bricolage do not create disruptive innovation separately. Their strategic effect appears through interaction. Policy support, regulatory pressure, supplier openness or digital infrastructure become relevant only when latecomer firms convert them into concrete resource moves: low-cost recombination, modular architecture, partnership-based scaling, service integration or localized adaptation.

The first pathway is affordability-based disruption. It is closest to the original logic of disruptive innovation. A latecomer firm may not challenge incumbents through the most advanced premium vehicle. Instead, it may offer a “good enough” NEV at a price and cost of use that opens the market to wider user groups. In this pathway, affordability includes not only purchase price, but also charging costs, maintenance, financing, insurance and service access. Recent studies confirm that high purchase and maintenance costs, weak charging infrastructure, limited consumer knowledge and policy uncertainty remain major barriers to wider EV adoption (Mesquita et al. 2025). Therefore, the strategic task is not simply to reduce price, but to reduce the total barrier to electric mobility without weakening reliability or safety.

The second pathway is modular product recombination. NEVs are built around batteries, electric motors, sensors, software, digital interfaces and platform components that can be combined in different ways. This creates opportunities for latecomer firms because they can rely on external suppliers and modular platforms instead of developing every component internally. This pathway reflects the logic of architectural innovation, where existing components are recombined into a new product architecture (Henderson, Clark 1990). Modular electric vehicle platforms also support production efficiency and scalable EV manufacturing (Lampón 2023). For latecomers, the main challenge is to decide which modules can be outsourced and which integration capabilities must remain under internal control.

The third pathway is policy-window acceleration. The NEV sector is strongly shaped by subsidies, tax rules, charging infrastructure, urban access policies and government procurement. These institutional conditions may create temporary opportunities for entry and learning. Research on the Chinese electric vehicle industry shows that policy, technology and market-demand windows interacted in the catch-up process (Xiong et al. 2022). However, policy support becomes strategically productive only when firms use it to build capabilities. If a firm designs products mainly for subsidies or administrative targets, the business model may weaken when the rules change. A stronger version of this pathway uses policy support as a bridge toward market-based competitiveness.

The fourth pathway is ecosystem-based service innovation. NEVs increasingly function as digital and service-connected products. Their value depends not only on the vehicle itself, but also on charging systems, mobile applications, software updates, leasing, insurance, energy management, after-sales services and user data. Research on EV charging business models shows that charging infrastructure should be understood as part of a broader system of market participation, grid flexibility and stakeholder coordination (Anggraini et al. 2025). In China, charging and battery-swapping infrastructure has developed through the interaction of policy support, technological upgrading, business-model experimentation and user experience improvement, although standardization and profitability remain important constraints (Wang, Zhang 2025). For latecomer firms, the ecosystem pathway allows value to shift from product ownership to service convenience and user dependence on the firm’s wider mobility system.

The fifth pathway is outward adaptation under pressure. When NEV latecomer firms enter foreign markets, they face safety standards, certification rules, data regulation, consumer protection, labour requirements, local-content expectations and trade measures. The European Commission’s countervailing duties on battery electric vehicles from China illustrate how institutional pressure can directly affect international expansion (European Commission 2024). In this pathway, bricolage means adapting the business model, not only the product. Firms may recombine partnerships, production locations, service alliances, compliance routines and localized branding in order to remain competitive

and legitimate abroad. Recent research on Chinese EV manufacturers also shows that international markets may serve not only as export destinations, but also as arenas for learning and capability upgrading (Liu et al. 2026).

Taken together, the five pathways show that disruptive innovation in NEV latecomer firms is not a single route. It depends on how firms connect institutional openings, available resources and capability development. A latecomer firm may begin with constraint, but constraint becomes strategically meaningful only when it is converted into a focused value proposition, supported by reliable routines and adapted to changing institutional conditions.

Discussion

The proposed framework should be interpreted not as a description of firm success, but as an explanation of the conditions under which latecomer status may become strategically productive. The model does not suggest that resource weakness is an advantage in itself. In most cases, limited resources restrict strategic choice. However, in a changing industry such as NEVs, constraints may force firms to search for alternative architectures, lower-cost models, flexible partnerships and neglected user groups. This interpretation is consistent with disruptive innovation theory, where market change often begins from overlooked users, lower-cost solutions or alternative value propositions (Christensen et al. 2015). It is also consistent with latecomer-firm research, which shows that late entrants may overcome disadvantages through learning, linkage and resource leverage rather than through immediate possession of superior assets (Hobday 1995; Mathews 2002).

This point is important for avoiding an overly optimistic reading of the model. Latecomer status does not automatically create flexibility, and scarcity does not automatically create innovation. Many resource-constrained firms fail because they cannot secure quality, finance, suppliers or trust. The argument of this article is more limited: under certain conditions, resource constraints may push firms to search for alternative strategic combinations.

This interpretation also changes how institutional complexity should be understood. Regulation, policy targets, safety standards, data rules and trade barriers are not only external obstacles. They shape the field in which latecomer firms identify opportunities and define legitimate strategies. In the NEV sector, institutions influence not only market entry but also product design, infrastructure access, localization, consumer trust and international expansion. Therefore, institutional complexity becomes part of the innovation process itself (Oliver 1991; Greenwood et al. 2011; Pache, Santos 2010). A latecomer firm may benefit from a policy window, but only if it uses that window to build capabilities rather than to depend on temporary administrative support.

The model also clarifies the limits of resource bricolage. Bricolage explains how latecomer firms can start without a complete resource base, but it does not explain long-term competitiveness by itself. In the NEV sector, improvisation can reduce entry costs and accelerate experimentation, yet it can also produce fragmented architectures, unstable supplier dependence and weak quality control. This is why the transition from bricolage to capability is central. Bricolage becomes strategically valuable when repeated recombination turns into routines for integration, testing, scaling, after-sales support and adaptation (Baker, Nelson 2005; Senyard et al. 2014).

This is especially important in the automotive industry because the product is safety-critical. A firm cannot rely only on improvisation when the final product must meet safety standards, warranty obligations and customer expectations. Therefore, bricolage must be disciplined. It should reduce unnecessary complexity and cost, but it should not weaken the basic reliability of the vehicle.

Dynamic capabilities play the role of this conversion mechanism. They connect institutional interpretation, resource recombination and strategic scaling. In practical terms, they allow firms to sense when a policy or market window is opening, seize it through product and business-model

choices, and reconfigure resources when the environment changes (Teece et al. 1997; Teece 2018). This is especially important for NEV latecomer firms because the sector changes simultaneously in several dimensions: technology, regulation, infrastructure, trade conditions and consumer expectations. Without dynamic capabilities, bricolage may remain local and temporary. With them, it can become a basis for scalable competitive action.

The model also helps specify what should and should not be called disruptive innovation. In the NEV sector, rapid growth, policy support or advanced technology does not automatically mean disruption. A premium electric vehicle, for example, may represent technological progress but remain sustaining innovation if it serves already profitable market segments and does not change access or competitive expectations. Disruption appears when a firm changes who can use the product, how the product is accessed, how mobility is organized or how incumbents are forced to respond (Christensen 1997; Christensen et al. 2015). This distinction is necessary because the term “disruptive innovation” is often used too broadly.

This also means that the same firm may be disruptive in one respect and non-disruptive in another. For example, it may use an ordinary battery technology but create a disruptive financing or service model. Conversely, it may use advanced technology but sell only to premium customers and leave the structure of the market unchanged. The analytical focus should therefore be placed on the market effect, not only on the technology itself.

The five pathways identified in the article should therefore be read as analytical mechanisms rather than as fixed firm categories. Affordability-based disruption explains how latecomers may expand access for price-sensitive users. Modular product recombination explains how external suppliers and flexible architectures may shorten development cycles, which corresponds to the logic of architectural innovation (Henderson, Clark 1990). Policy-window acceleration explains how public support may create temporary learning opportunities, especially when technology, policy and demand windows interact (Xiong et al. 2022). Ecosystem-based service innovation explains how value may shift from the vehicle alone to the surrounding service system. Outward adaptation explains how internationalization requires institutional adjustment rather than simple export growth, especially under regulatory and trade pressure (European Commission 2024).

The framework also warns against two simplified interpretations. The first is the view that latecomer firms are only imitators. This underestimates their ability to use technological discontinuity, institutional windows and recombined resources. The second is the opposite view that all successful NEV latecomers are disruptive. This overstates the concept and ignores the difference between growth, catch-up, sustaining innovation and market-changing innovation. A firm may be disruptive in one segment, sustaining in another and already incumbent in a third. The pathway model is useful because it allows these differences to be analysed without forcing firms into one fixed label.

The model also clarifies the managerial meaning of disruption in NEV latecomer firms. The central issue is not whether a firm is technologically advanced, but whether it can define a user problem that incumbents serve poorly. This problem may concern price, charging access, service convenience, financing, urban mobility or reliability in lower-cost segments. In this sense, disruptive potential depends on the firm's ability to connect an institutional opening with a concrete resource recombination and a value proposition that changes access or use.

Internationalization makes this logic more demanding. When NEV latecomer firms enter foreign markets, they do not simply transfer a domestic model abroad. They face new safety standards, data-protection rules, consumer expectations, warranty norms, labour requirements and trade measures. Therefore, outward expansion becomes a test of institutional adaptation. Low price alone may be insufficient if the firm cannot build local partnerships, transparent compliance routines and credible service networks. Under these conditions, institutional pressure can become a source of capability development only when firms translate it into localized and reliable business models.

Recent firm-level research on BYD and CATL supports this interpretation. Their catch-up was not only the result of state industrial policy, but also of systematic technological effort, proprietary knowledge, organizational capability building, capital investment, market demand and local supporting networks (Whitfield, Wuttke 2026). This evidence is important because it shows that latecomer success depends on the interaction between institutional conditions and firm-level capability formation.

The model also has policy implications. Public support for NEV latecomer firms should not be evaluated only by short-term sales growth or production volume. If support measures reward only rapid expansion, they may encourage dependency on subsidies and weak capability formation. A more sustainable policy approach should strengthen learning, standards, charging infrastructure, supplier upgrading, testing capacity, transparent regulation and fair competition. In this way, policy can reduce uncertainty and support wider EV adoption while helping latecomer firms move from temporary experimentation to durable organizational and technological capabilities (Mesquita et al. 2025; Wang, Zhang 2025).

Conclusion

This article examined how NEV latecomer firms can pursue disruptive innovation under conditions of institutional complexity and resource constraints. The central argument is that latecomer firms do not necessarily have to reproduce the full resource base of established automotive incumbents. Their strategic opportunities emerge when technological discontinuity, policy windows, changing demand and accessible external resources can be recombined into new value propositions.

The proposed framework shows that disruptive innovation in the NEV sector should be understood as a process of strategic conversion. Institutional complexity creates both constraints and opportunity windows; resource bricolage allows latecomer firms to act under constraint; dynamic capabilities help transform temporary experiments into scalable routines. Disruptive outcomes appear only when this process changes market access, affordability, user practices or competitive expectations.

The article identified five strategic pathways: affordability-based disruption, modular product recombination, policy-window acceleration, ecosystem-based service innovation and outward adaptation under regulatory and trade pressure. These pathways show that latecomer firms may challenge incumbents not only through technological advancement, but also through lower adoption barriers, flexible architectures, service ecosystems, policy timing and institutional adaptation.

The theoretical contribution of the article is the integration of disruptive innovation theory, latecomer catch-up, institutional complexity, resource bricolage and dynamic capabilities into one conceptual model. This model helps distinguish disruptive innovation from simple market growth, technological improvement or policy-supported expansion. It also shows that latecomer firms should be analysed through specific mechanisms rather than through a simple opposition between weakness and success.

The practical implication is that NEV latecomer firms should focus on underserved users, resource recombination, partnership-based scaling, product reliability and the gradual development of organizational capabilities. For policymakers, the findings suggest that support measures should strengthen learning, standards, infrastructure, supplier upgrading and fair competition rather than only short-term production volume.

The study is conceptual and does not test the proposed framework with firm-level empirical data. It does not compare financial performance, patent portfolios or international market outcomes across NEV companies. Future research can apply the model to comparative case studies, product-platform analysis, patent data, survey-based research or internationalization cases in Europe and emerging

markets. This would make it possible to assess which pathways are most effective under different regulatory, technological and market conditions.

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