



THE REGIONAL COORDINATION OF INDUSTRIAL POLICY: A New Framework for Coordinative Optimisation

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ABSTRACT

At a time when late-industrialisation opportunities are compressed, how can industrial policy be reconceived at the regional - rather than national-level? For developing nations that lack the domestic market scale to deploy demand-led industrial policy, unilateral strategies risk costly duplication, and a race to the bottom on social and environmental standards. Drawing on global lessons from ASEAN's flexible institutionalism, Airbus' negotiated division of labour, and the limits of EU-style cooperative maximalism, the paper reviews the merits and limitations of different regional industrial policy models within a three-level typology of minilateral, plurilateral, and supranational coordination.

Drawing on complex systems theory and game theory, we then introduce a new model of coordinative optimisation for industrial policy whereby optimal regional coordination is achieved through a coordinating body that functions not as a supranational authority but as an information broker: collecting feasible best responses from sovereign participants, aggregating distributed preferences, and returning coherent specialisation analyses that minimise total system duplication and address regional supply chain shortfalls to enable participants to adjust their strategy for optimal gains.

The model rests on three interlocking mechanisms. First, a principle of triple flexibility (compositional, longitudinal, and directional) allows the framework to accommodate political diversity, government turnover, and rapidly shifting technological and market conditions without disrupting ongoing collaboration. Second, the folk theorem logic of repeated interaction is embedded in the institutional design to enable iterative rounds of information revelation and preference adjustment towards building the trust necessary for sustained cooperation. Third, learning from historical failures, this model serves to protect national sovereignty within a cooperative regional space for industrial policy, thereby addressing a major political barrier in previous attempts at regional integration. By doing so, our model challenges traditional integration theory.



ACKNOWLEDGEMENTS

The authors would like to thank Joseph Stiglitz, Ha-Joon Chang, Robert Keohane, Rob Davies, Tham Siew Yean, Reda Cherif, Bentley Allan, Jan Yves Remy, Adeyemi Dipeolu, Ambassador David Prendergast, Taffere Tesfachew, Mengdi Wang, Wenying Liao, Emily Jones, Andres Valenciano, Faizel Ismail, Julia Eder, Maria Esther Morales Fajardo, Fuad Hasanov, José Manuel Salazar-Xirinachs, Martin Abeles, Fiona Tregenna, Rasmus Lema, Laura Carvalho, Luis Godoy, Lilia Couto, for their valuable comments, feedback, resources and inputs throughout the development of this paper.

Earlier versions of this work were presented and provided as inputs in high-level policy dialogue on regional trade hosted by the United Nations Economic Commission for Latin America and the Caribbean in Santiago (Chile), by the CARICOM secretariat (in Santa Lucia), PAFTAD, the United Nations Conference on Trade and Development, Iniciativa Uruguay Sur, and the advisory council of the African Continental Free Trade Area (AfCFTA).

This work also benefited from feedback in various conferences and talks given at Harvard University, Princeton University, the University of Johannesburg, UNU-MERIT, the University of Oxford, the African Programme on Rethinking Development Economics, the GLOBELICS annual conference. The authors are grateful to all participants in these discussions for their insightful engagement and suggestions. All remaining errors and omissions are solely the responsibility of the authors.

This paper is part of a forthcoming special issue on industrial policy in the Oxford Review of Economic Policy.



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1. Introduction: When Windows of Opportunity are Too High to Reach (Alone)

After decades of market-led development recipes, industrial policy is back, and increasingly mainstream. While this widening of the intellectual policy space is certainly welcome news for developing countries, it is, however, not necessarily synonymous with a rising development tide.

Neo-mercantilist inclinations, from protectionist measures to subsidy races, are compressing the development space available to latecomers at precisely the moment when sustainability imperatives and digital transitions could offer new windows of opportunity for development and catch-up (Lebdoui, 2024). For most developing economies, in particular smaller ones, the choice of acting alone is an increasingly risky and costly strategy.

The question of the limits of the national scale is an old question in development debates (see Kuznets, 1960) but remains very relevant today. Even in the case of recent 'green' industrial policy both in the global North and in the global South, the recent successful experiences seem confined to large countries (e.g., China, Brazil, India), that were able to leverage internal demand (for instance by relying on demand-side policies to generate economies of scale while imposing local content requirements) (see Meckling 2021; Lema and Ruby, 2007; Pegels, 2014; Allan, forthcoming;).¹ Countries with smaller domestic markets cannot replicate these models.

More generally, when several neighbouring countries simultaneously pursue similar industrial strategies in isolation, the collective result is likely to be costly duplication of investment in which individually sensible decisions lead to a fallacy of composition, destructive competition for the same pools of foreign capital, and a race to the bottom on labour and environmental standards. Countries behave as in a prisoners' dilemma—i.e., privileging the self-interest option—except that in this real-world game there is no guarantee that going alone is an individually optimal strategy. This is, fundamentally, a coordination problem.

In the past decades, most discussions on regional economic cooperation have followed the logic of trade integration, i.e., the creation of free trade areas and common markets. Such an approach, as we will discuss (see section 2), has led to disappointing results in developing regions. Intra-regional trade in Latin America,

¹ In countries with a small domestic market, local content requirements rarely work on their own, and their poor implementation can reduce the attractiveness of investments in renewables, or even worse, they can increase the levelized cost of energy (LCOE), thereby reducing the cost competitiveness of downstream industries.

Sub-Saharan Africa, and much of South and Southeast Asia remains extremely low (Davies 1996; Morales Fajardo, 2007; Ismail, 2018; Eder 2021). There is a structural explanation behind these outcomes: productive structures across these regions are too similar and concentrated to generate more trade flows (Davies 1996; Morales Fajardo, 2007; Ismail, 2018; Eder 2021).

Against this backdrop, this paper argues that it is necessary to move the discussion of regional economic cooperation from trade integration to industrial policy coordination, in line with the emerging literature on developmental regionalism. Industrial policy coordination would seek to actively build new productive complementarities, allocating investments across national boundaries, and building supply chain linkages (Davies, 1996; Lebdioui, 2022). Without doubt, this represents a complex institutional task, and it arguably is unlikely to be accomplished by replicating at the regional level the supranational ambitions that have characterised the European Union's model of integration, which presupposes levels of political trust, institutional capacity, and economic interdependence that most developing regions do not possess (Eder, 2021).

The question of coordination is central to industrial policy. Indeed, industrial policy presupposes the coordination of policies, the coordination of institutions, and the coordination of complementary or competing investments (Chang, 2002, 2011; Chang & Andreoni, 2020; Johnson, 1982; Rodrik, 2004). How, however, to make sense of the question of coordination when thinking about industrial policy at the regional level? This question has generally been overlooked in the green transitions and industrial policy literature, which has focused on national conditions/dynamics/processes. While recent efforts are starting to address the global dimensions of industrial policy and its tensions (see Stiglitz forthcoming; Abdenur et al. 2025), the dominant tradition in development thinking has addressed the question of industrialisation at the national scale, treating the state as the relevant unit of agency and domestic policy instruments as the relevant levers.

The paper proposes a novel institutional logic, one that we term *coordinative optimisation*. Drawing on complex systems theory and game-theory, we make the case for a strategy of industrial policy coordination that will be supported by the establishment of a coordinating body that functions as an information broker: one that collects feasible best responses from participants, aggregates distributed preferences and capabilities, and returns specialisation options that would help to reduce duplication, and identify regional supply chain shortfalls.

The paper proceeds as follows. The first section discusses the limits of the existing debates and arguments on regional economic cooperation from free trade to historical debates on productive regional integration. The second section

develops a typology of regional coordination institutional models based on three examples: the supranational model exemplified by the European Union, the intergovernmental model exemplified by ASEAN, and the minilateral model exemplified by Airbus. The third section introduces our model of coordinative optimisation, as well as some key aspects of the institutional design of our coordinating body proposal.

Two important points must be clarified before proceeding. First, although this analysis covers many regions, the article focuses primarily on Latin America, the Caribbean, and Africa. In these regions, indeed, the combination of abundant resource potential, fragmented productive structures, and ineffective regional institutions makes the problem of coordination particularly acute. Second, this article does not claim that regional coordination can replace national industrial policy or participation in the multilateral trade and investment system. Regional coordination should be seen as a necessary complement to both of these elements.

2. What Do We Know About Industrial Policy Beyond the National Scale?

The problem of the limits of the national scale is not novel to development thinking. Back in 1960, Simon Kuznets was already reflecting on the challenge of 'Economic Growth Of Small Nations', and of industrialisation more specifically, noting that 'the economic structure of small nations is typically less diversified than that of larger units' and 'that some of the full variety of industries observed in the larger nations is either lacking or only barely represented in many small nations' (Kuznets, 1960, p. 15).² So, what options exist for developing nations looking to industrialise through export led-growth? Historically, two main approaches can be differentiated: one that could be described as "market piggybacking" strategy, the other one as developmental regionalism.

The "Market Piggybacking" Model and its Limits

The idea of "piggybacking" on a larger and/or more economically prosperous neighbouring country's demand as an industrial development strategy has been one important feature of economic development in the era of neoliberalism and globalisation. This approach is best exemplified by the industrial strategy pursued by Vietnam (with China), Poland (with Germany) or Mexico (with the USA market).

² Importantly, he also argued that the threshold for 'smallness', which he then set (somewhat arbitrarily) at 10 million inhabitants, would only rise with economic development and the average scale of industrial production and, therefore, increasing the difficulty of economic development in most of the developing world.

Vietnam's proximity to China has allowed it to tap into the Chinese supply chain as Chinese labour costs have risen. Many companies have moved their production to Vietnam, attracted by its lower labour costs and improving infrastructure, thereby allowing Vietnam to export intermediate goods (especially in industries such as electronics, textiles, and machinery) back to China and most strategically, to the United States. Thanks to this strategy, Vietnam has enjoyed high economic growth rates, which since 2015 have averaged around 7% (World Development Indicators, 2025). At the same time, however, its dependence on exports has increased significantly. Whereas exports accounted for 54% of the country's GDP in 2010, they account for more than 90% in 2024 (ibid.)

Similarly to Vietnam with China, Poland's economic strategy also exemplifies this model, leveraging the market demand and industrial dynamics of its neighbour, Germany. Benefiting from Germany's industrial demand, technology and increased labour costs, which led several German companies to move production to Poland, attracted by both lower labour costs and a skilled workforce, Poland leveraged its geographic proximity to develop industrial capabilities in the automotive, electronics, and machinery sectors. It is also along these lines that Mexico industrialised, by leveraging its preferential access to the US market allowed by NAFTA (and the subsequent entry into force of the USMCA), the presence of low-wage skilled labour as well as domestic capabilities to attract investments in low carbon technology supply chains (especially in the automotive sector).

The experiences of Mexico, Poland and Vietnam reveal that the ability to tap into another country's market is conditioned by several factors, including signed trade agreements, domestic capabilities, geographic proximity, and transportation costs and by the very capacity for the piggy backing economy to build a purposeful industrial policy around the one of its driver partner (e.g., Poland). Yet, even if those policies are helpful to improve supply-side industrial capabilities, such a strategy has demonstrated important limits. As history shows (especially for Mexico in the Trump years), heavy dependence on a single market can expose a country to economic vulnerabilities if there is a downturn or radical policy change in the larger country. Market diversification and strategic planning are essential to mitigate these risks. It is also crucial to ensure that this strategy aligns with the long-term domestic developmental goals, rather than locking countries in unsustainable development routes, or to a race to the bottom in terms of labour costs.

Regional Coordination Beyond Common Markets: The Limits of the Linear approach to Trade Integration

The piggy-backing form of industrial development has been facilitated by the pursuit of one form of regional cooperation and integration: the development of free trade agreements (FTAs) and common markets. These, indeed, are very much products of the post-1980s economic Zeitgeist and its confidence in the benefits of trade liberalisation. The liberalisation of trade, the conventional wisdom narrative goes, is the most effective path towards regional integration, at both an economic and political level (Kemp & Wan Jr, 1976). These agreements, beyond the controversial outcomes mentioned above, have generally yielded poor developmental outcomes. When they involve partners with very different development levels, they have tended to entrench the less developed partner in patterns of specialisation in primary goods or cheap labour. More generally, when common markets or free trade zones cover regions with similar productive structures, they have often failed to build up interdependencies (more on this in section 4).

Latin America offers an illustrative example. Despite the existence of numerous and overlapping trade agreements, the region presents some of the lowest indicators of intra-regional integration. Thus, intra-Mercosur (Argentina, Brazil, Bolivia, Paraguay, and Uruguay) trade amounts, in 2022, to a meagre 14% of the group's overall trade, while the equivalent figure for the Central American Common Market (Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador) stands at 13%, for the Andean Community (Bolivia, Colombia, Ecuador and Peru) at about 7.5%. The most dramatic example of this pattern is that of the Pacific Alliance (Chile, Colombia, Mexico, Peru). Although the four nations account for about 41% of the region's GDP, and almost 60% of its total trade, intra-trade within the bloc only represents a mere 2.5% of the group's total trade (Palermo, 2022; Government of Mexico, n.d.).

This inconsistency can be explained in several ways. Firstly, it is a necessary consequence of the productive pattern of the economies in the region which mostly feature export-oriented and highly concentrated productive structures around a few commodities, that is, of their lack of industrial and technological capacity (that is linked, in other regions, to both intra-trade in manufactured goods and in services). Secondly, the limited but existing industrial capacity the region still possesses has been unable to establish regional productive networks. As a result, trade liberalisation has very little effect on the industrial dynamism of the region. To take one example, the reduction in tariff barriers between Mercosur members has only had a modest impact on the dynamism of the regional automotive industry. More than anything, it has served to give breathing space to the blocs' relatively uncompetitive domestic producers. The total numbers of motor vehicles imported by Brazil from Argentina only accounted for about 9% of its own total production in

2023, and the auto parts exported from Brazil to Argentina represented, in 2022, less than 10% of the former's total output (own calculations using data from ANFAVEA, 2024). This integration has allowed Argentina's automotive industry to remain in business by exporting specific categories of vehicles (e.g., medium-size pickups) to Brazil, while it has allowed Brazil to modestly expand its foreign sales.

To unlock the full benefits that regional cooperation can bring for economic transformation, moving beyond linear approaches to trade integration and emphasize a multi-sectoral programme embracing production, infrastructure, and trade, notably to build regional value chains, is needed to foster industrial transformation and social welfare (Davies, 1996; Ismail, 2018, Stiglitz, 2016). Because the potential of a regional block is more than the sum of their parts, regional developmentalism is also based on the idea that neighbouring countries leverage their complementary assets (whether it is critical minerals abundance, manufacturing capacity, renewable energy potential, as well as proximity to important trade routes) to develop an efficient regional industrial ecosystem around climate-related technologies (Ismail, 2018; Lebdioui, 2022).

From Linear Integration to Developmental Regionalism: The Unresolved Institutional Question

In the development literature, so-called classical development theorists-i.e., the development economics that understood development as a process of industrialisation and structural transformation-have been at the vanguard of the developmental regionalism question. This was particularly true of Latin American structuralists (See ECLAC, 1959; Ferrer 1978). Very early on, they recognised that the progress of import substitution industrialisation (ISI) processes was limited by certain structural limits (i.e., external imbalances, dependence on the import of capital goods, increasing debt burdens). Most notably, Latin American economies were failing to both (i) diversify their exports and make their new local industrial production competitive on international markets, and (ii) substitute imports of the capital goods they now imported in increasing quantities.

As early as 1959, in a document titled *The Latin American Common Market*, the Economic Commission for Latin America and the Caribbean recognised the necessity for greater regional integration: "Latin America," the report argues "will be unable to carry out its development plans ... unless it makes a sustained effort to establish within its own territory the capital goods industries of which it is in such urgent need today" (ECLAC, 1959, p. 1). This early confidence in the transformative potential of an enlarged Latin American market was, however, rapidly tempered. Indeed, in the absence of more interventionist and coordinated efforts between

regional economies, the creation of a common market was unlikely to solve the problem of the region's dependence on the imports of capital goods or technologies on its own. As Aldo Ferrer (1978, p. 73), a disciple of Prebisch, argued, "[t]he formation of an expanded market between underdeveloped economies, with a low degree of prior interdependence, does not provide sufficient stimuli for the expansion of trade".

Developmentalist scholars also recognised that "[i]n the absence of other elements of action and guidance, international corporations would be the main beneficiaries of regional trade liberalisation and the integration of physical space" (de Appendini, 1971, p. 93). In response, greater attention was to be dedicated to the question of *regional productive integration*, i.e., the promotion of regional specialisation and industrial complementarity (Gomes & Tavares, 1998).³ The search for productive regional integration, moreover, had to be mindful not to lead to the reproduction, at the regional level, of the centre-periphery polarisation that it was seeking to overcome (Eder, 2019). It would need to guarantee, Ferrer (1978, p. 69) recognised, the "equal distribution of the fruit of productive specialisation". In this pursuit, particular emphasis was placed on the necessity to promote *intra-industrial specialisation*. As Ferrer (1978, p. 70) contended, "[i]ndustrial specialisation at the level of products rather than branches is ... the answer to the necessary compatibility between Latin American integration, the equitable distribution of its fruits and integrated development at the national level".

However, this 'balanced regional development' could only be achieved through extensive institutional coordination efforts. As François Perroux, 1955, p. 309 explained, "[g]rowth does not appear everywhere at once; it manifests itself at points or poles of growth, with varying intensities; it spreads through various channels and with varying final effects for the economy as a whole". One way to strategically think about this issue was to think about what Lagos (1966) termed 'poles of integration', that is, integrated poles of growth and development maximising the potential for the integration among nations through the creation of mutual interests, shared benefits, regional infrastructures etc. (Perroux, 1968). This question has recently received particular attention as scholars have started to discuss sectors that could more strategically support the development of regional industrial cooperation and integration. Yet, if it was acknowledged that the question of integration would need to "be conceived also as part of a comprehensive national

³ It is important to note, that, in the 1970s, the question of regional integration converged with yet another major ideational trend: that of the fight for the establishment of a New International Economic Order (NIEO). As part of the NIEO agenda, the expansion of the possibility for cooperation between developing nations occupied a very important position (Ahumada, 2025). One important concept associated with the NIEO was that of *collective self-reliance*.

development policy” (Gomes & Tavares, 1998, p. 3), the question of the institutional framework that could allow for the articulation of national development policies (e.g., the selection of the location of development poles, or the maximisation of their integration potential, as well as to govern the distribution of their benefits across national territories), remained largely undefined.

The possibility of regional forms of industrial policy necessarily involves discussing the management not just of domestic but also multilateral forms of conflicts and coordination and the institutional forms required to govern them, (which are further discussed in section 3 and 4). In practice, achieving such a regional coordination of industrial policy is a challenge, across all regions. Political and ideological differences, external influences, and gaps in physical infrastructure connectivity, as well as disparities in economic development levels among neighbouring countries, can generate resistance to regional integration (Lebdioui, 2022). As a result, it is useful to analyse this process through the lens of a prisoner’s dilemma.

The Prisoner’s Dilemma of Regional Industrial Policy and the conditions for cooperation

To understand the complexity of the regional coordination question, valuable insights are offered by game theory, particularly the Prisoner’s Dilemma and the Stag Hunt, two distinct games. The Prisoner’s Dilemma describes a situation where actors, pursuing individual advantage, choose strategies that benefit them separately but harm them collectively—i.e., mutual defection becomes rational despite mutual cooperation being superior, because each has incentive to defect regardless of what others do. The Stag Hunt, in turn, describes a situation where actors recognise that coordinating their strategies would benefit all, yet fail to achieve this coordination because each fears the others will not commit.

Both frameworks directly apply to our present discussion. In developing regions, the reality of shared conditions, problems and challenges faced by each individual country (e.g., concentrated productive structures, external imbalances, high un- and under-employment), often leads countries to behave as if in a Prisoner’s Dilemma, that is, preferring autonomy over cooperation. This is most often visible in two key aspects: in attracting foreign direct investments (FDIs) and in the redundancy of industrial policy plans across countries in a given region. The attractiveness of autonomy seems all the more rational given that the cost of non-cooperation is low since defection simply maintains the status quo of limited interaction rather than risking destroying existing relationships.

Yet the objective reality more closely resembles a Stag Hunt. Most countries are highly unlikely to achieve meaningful economic transformation either through FDI attraction alone or uncoordinated industrial policy pursued in isolation. As we have explained, markets remain too small to support scale economies, capabilities too limited to compete globally, and resources too constrained to build comprehensive industrial ecosystems. This is true even in the case of the USA, as Allan (forthcoming) shows with respect to the limits of the Inflation Reduction Act in the absence of a coherent international strategy. This coordination failure means countries forfeit massive opportunities to pool resources, share the costs of large-scale infrastructure projects, or create integrated value chains that would benefit all participants. This can be referred to as the 'developmental price of anarchy', i.e., the developmental cost of non-cooperation (more on this in section 4).

Against this background, the task is to think about institutional configurations that could allow countries to both escape their preference for defection (non-cooperation) and at the same time genuinely addressing problems of coordination failures. Here the seminal work of Axelrod & Keohane (1985, p. 227) on the nature and characteristics of the institutional frameworks supporting cooperation provides us with important analytical elements. It is possible to distinguish at least three key dimensions influencing the conditions of cooperation among national states: the mutuality of interests, the number of participants, and the shadow of the future.

The first dimension is the capacity for individual states to recognise a 'mutuality of interests'. 'Cooperation', Axelrod and Keohane (1985, p. 227) recall, 'is not equivalent to harmony. Harmony requires complete identity of interests, but cooperation can only take place in situations that contain a mixture of conflicting and complementary interests'. The degree of mutuality of interest is fundamentally determined by the understanding participants have of their own interests. This, as we will explore in more details below, is itself linked with their capacity to adequately perceive the benefits they could gain from cooperation or the costs of anarchy.

Secondly, cooperation is also affected by the number of participants in cooperative arrangements. It is evident that large associations of countries create more difficult mechanisms of coordination and cooperation. Not only is the possibility of aligning interests more complex, but also the capacity to ensure reciprocity between the participants (Axelrod & Keohane, 1985; Keohane, 1986). This is why successful regional cooperation often develops according to an expansionary dynamic, based on the desire to integrate new participants, rather than on the basis of the largest possible number of participants from the outset. To the emphasis on the number of participants should also be added an emphasis on

the number of issues being the objects of cooperation (see section 4). An extremely ambitious cooperation agenda reduces the likelihood of cooperation.

Finally, cooperation is also determined by the so-called 'shadow of the future'. Fundamentally, this concept refers to the (un)certainly of the commitment to cooperation by the participants. Axelrod and Keohane (1985, p. 232) identify four key factors necessary to mitigate the risk the shadow of the future imposes on cooperation: (i) long-time horizons; (ii) regularity of stakes; (iii) reliability of information about the others' actions; and (iv) quick feedback about changes in the others' actions'. In a context of weak interdependences, the possibility of defection is high as its perceived cost is low. Indeed, it would only mean the reproduction of the *status quo*. The capacity of the institutional structure in charge of facilitating cooperation and coordination to ensure that they engage on a regular basis and in dialogues based on a transparent sharing of information is essential to allow for mutual trust to be built between countries.

3. A Three-Level Framework for the Coordination of Industrial Policy: Minilateral, Plurilateral, and Supranational.

The Regional Industrial Policy Toolbox

From a policy perspective, developmental regionalism implies regional measures that do not only consist in horizontal policies (which are sector-neutral) that are principally concerned with harmonisation of norms, the integration of physical infrastructures or macroeconomic systems across nations, but also vertical ones. Existing examples of regional horizontal policies are numerous, from the building of transnational electricity grids to the harmonisation of fiscal rules, or the creation of common macroeconomic mechanisms like currency unions (see Table 1).⁴ The industrial policy literature has, however, emphasised the limits of horizontal policies as a necessary but insufficient condition for structural transformation (Chang, 1994; Cherif and Hasanov, 2019; Mazzucato, 2016). Vertical policies aim at supporting the

⁴ The European Union evidently offers the most illustrative example of regional integration and coordination in horizontal policies with the establishment of European norms and infrastructures, as well as macro-financial conditions (Eder, 2021). It is important to briefly mention one horizontal policy that has a great impact on the promotion of industrial activities: cumulative rules of origins. Cumulative rules of origin enable member countries within preferential trade agreements to collectively satisfy origin (or local content) requirements. This mechanism treats inputs from any member country as 'domestic' when calculating whether a final product qualifies for certain preferential treatment. It effectively allows production processes to span multiple national borders. Thus, rather than requiring each country to independently meet minimum content thresholds, cumulation permits the aggregation of value-added activities across a whole region, thereby creating incentives for cross-border production networks.

development of sectors that are unlikely to emerge spontaneously and therefore aim to defy the logic of comparative advantages and of the market (Lin & Chang, 2009). They are as Amsden (1992) famously expressed, policies that deliberately aim to ‘get relative prices wrong’. At the regional level, vertical policies can take a variety of forms, from the use of regional development banks able to provide subsidised credit, to the promotion of regional champions, or the pursuit of joint-research programmes, or pooled and coordinated procurement.

Table 1: Regional Industrial Policy Toolbox

	Supply	Demand
Horizontal	• Infrastructural Integration • Regulatory Harmonisation • Monetary Integration • Cumulative rules of origin	• Common Market • Monetary Integration
Vertical	• Regional Investment Promotion Agencies • Joint Research Programs • Joint Investment Programs • Regional Development Banks • Resource Cartels • Coordinated Subsidies • Regional Clusters • Joint-Ventures • Coordinated Skills Programs	• Coordinated Green Public Procurement • Harmonized Consumer Tax Benefits • Coordinated Climate Plans • Regional (green) external tariffs

Three-Level Regional Coordination Models

From an institutional standpoint, it is possible to identify three distinct levels of industrial policy coordination: the supranational level, the plurilateral level, and the minilateral level, each presenting different trade-offs between potential gains from cooperation and political feasibility (see Table 2).

Supranational coordination represents the most ambitious and institutionally dense form of regional industrial policy cooperation. It is characterised by the delegation of significant authority to a central body capable of setting binding rules, allocating resources, and enforcing compliance across member states. Supranational coordination maximises potential gains but faces high coordination costs, institutional rigidity, and risks of asymmetrical outcomes that can undermine both trust and national sovereignty and, as a result, the capacity to implement cooperative arrangements. Historically, many integrationist attempts have tended

to be structured around an extremely vast cooperation agenda, involving complex institutional structures hindering effective decision-making and involving the cessation of sovereign power and as such it is extremely vulnerable to political pendulum swings. Indeed, even in regions such as the EU which have managed to create a functioning supranational structure, the success of the coordination of industrial policies across countries remains contested (Draghi, 2024).

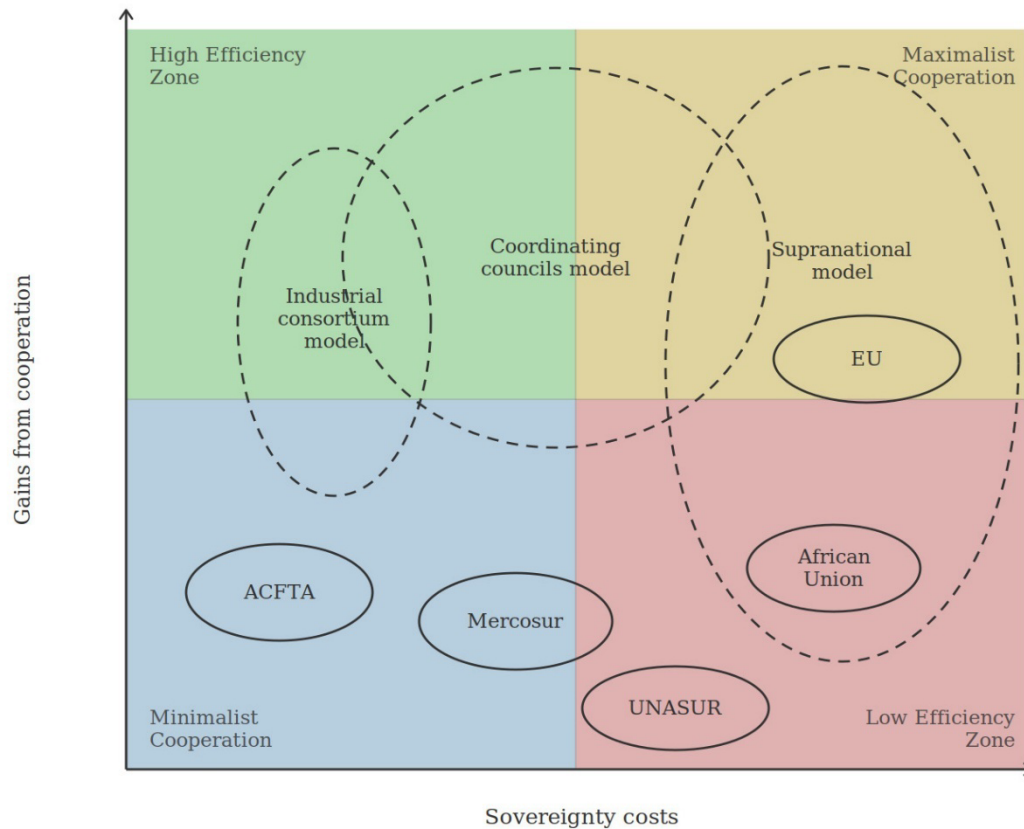
Meanwhile, plurilateral coordination lowers political barriers and enables direct coordination between national governments (ultimately responsible for the implementation of industrial policy). It provides a middle path that facilitates identification of productive complementarities while maintaining institutional flexibility. At the same time, however, this form of coordination possesses weaker enforcement mechanisms and more uncertain benefits. If not based on binding agreements and pooled resources, plurilateral coordination delivers uncertain material outcomes (Albertone et al., 2025).

Lastly, minilateral coordination necessarily constrains the potential benefits to those achievable within smaller coalitions, across nations and sectors. With a central idea to 'bring to the table the smallest number of participants needed to have the largest possible impact' (Naim, 2009, p. 136), minilateralism provides the framework to achieve high effectiveness in narrow domains but often cannot sustain systemic transformation.

Table 2: Three Levels of Multilateral Coordination

	<i>Examples</i>	<i>Benefits</i>	<i>Limitations</i>
1st Level: Supranational Coordination	European Union African Union	Greater and more diverse potential benefits from coordination	High coordination costs, institutional rigidity, High risk for asymmetrical outcomes, Difficulty to maintain trust, Risk of <i>de facto</i> inefficacy
2nd Level: Inter-governmental Coordination	ASEAN Coordinating Councils	Easier to identify productive complementarities, Open to a plurality of institutional configurations	Risk of <i>de facto</i> inefficacy, Uncertain potential benefits from cooperation
3rd Level: Minilateral Coordination	- Airbus (joint initiative between the governments of France, Spain, Germany and UK) - Singapore-Australia Green Economy Agreement - UK and Norway Green Industrial Partnership	More realistic in context of low interdependence or low trust between the participants, Open to a plurality of configurations amongst a coalition of the willing	Limited potential benefits from cooperation amongst fewer actors

Figure 1: The Origami Graph of Coordination



It is important to note that we do not argue that there is a single optimal model of regional industrial coordination. Institutional design is contingent on existing levels of trust, degree of interdependence, and productive ambitions. Yet, given the complexity, uncertainty, and necessary flexibility of doing industrial policy at a regional level, we believe that most viable strategies may involve an institutional architecture where minilateral projects are embedded within plurilateral or multilateral platforms. In that direction, the rest of this section discusses empirical experiences from different regions and suggests a shift away from cooperative maximalism towards what might be termed pragmatic coordination: selective, flexible, and politically credible arrangements that prioritise feasibility over institutional ambition. This challenges traditional regional integration approaches and aligns more closely with evolutionary and political economy approaches to industrial policy in a fragmented global order.

Supranational Coordination: The Limits of EU-style Cooperative Maximalism

The developmental perspectives offered by supranational coordination have been the source of intense policy debates since the wake of post-independence state formation in the developing world and the post-WWII reconstruction in Europe.

The European Union (EU) represents the most advanced example of supranational coordination. Through mechanisms such as the Single Market, cohesion policy, and more recently the Green Deal Industrial Plan, the EU has sought to align national industrial strategies. It corresponds to the strongest form or “positive integration” (as referred in Tinbergen, 1954) where common policies are actively constructed to exploit scale economies and coordinate investment in strategic sectors (Aghion et al., 2015; Lebdioui, 2022).

Without doubt, the EU has generated substantial economic benefits. The single market has supported the trade integration of the region and the development of regional value chains, cohesion funds have allowed infrastructure development in peripheral European regions and, more recently, novel instruments such as the Important Projects of Common European Interest (IPCEIs) have managed to mobilise large-scale investment in strategic sectors such as batteries, hydrogen, and semiconductors (Eisl, 2022).

Yet, the EU model has also demonstrated structural limits. First, studies have shown the persistent divergence in productive capabilities across regions, with advanced economies capturing disproportionate shares of innovation rents and industrial capacity (Farole et al., 2018; Eder and Schneider 2018). IPCEIs, for example, have been heavily concentrated in Germany and France. The overall economic development of the bloc has similarly been highly dependent on the dynamism of its most powerful members.

Second, as illustrated by the 2024 report on EU competitiveness prepared by Mario Draghi, the EU has been failing to develop a coherent and effective capacity to do industrial policy at the regional level. In fact, economic gains have been primarily achieved through passive trade complementarities rather than an active and purposeful coordination of industrial policies across borders. Such a failure exposes the region to the risk of failing to maintain itself at the industrial and technological frontier and, consequently, of endangering the future of the EU model at large.

Industrial policy coordination requires complex bargaining among states with heterogenous economic structures, investment capacities, and political priorities. Yet the EU supranational, because of the scope of its membership and structure of its decision making process, has tended to suffer from what Scharpf (1988, 2006) described as the “joint-decision trap”: policies converge towards the lowest common denominator or are delayed to the point of irrelevance. Indeed, while it can generate large collective gains in contexts of strong interdependence and political cohesion, supranational coordination is structurally vulnerable to coordination failures.

The case of the EU illustrates why it makes little sense for developing regions to be pursuing a supranational coordination model, as is, for example, being attempted by the African Union (AU). First, unlike the EU, the AU lacks enforcement mechanisms and legal authority. The AU's supranational ambitions are indeed constrained by weak state capacity, low levels of intra-African trade, and limited trust among governments (Lopes, 2024). Yet, even in the absence of these constraints, as we have shown, the coordination of industrial policy at a supranational level is an extremely complex task.

Overall, supranational coordination appears as a bounded model whose feasibility depends on historically specific configurations of trust, symmetry, and institutional capacity.

Plurilateral Coordination: Lessons from ASEAN's Flexible Institutionalism

An intermediate model of regional industrial policy coordination is offered by plurilateral (or intergovernmental) institutional arrangements.

The Association of Southeast Asian Nations (ASEAN) is an illustration of this model (Acharya, 2001; Ravenhill, 2015; Albertone et al., 2025). ASEAN is based on the principles of non-interference, quiet diplomacy, and an incremental approach to regional cooperation. It serves as a platform for regional bargaining and dialogue, allowing member states to identify shared strategies and targets while respecting national sovereignty (Albertone et al. 2025; Mahaseth & Narain, 2022).

ASEAN's institutional architecture is built around a councils' system constituted of a layered architecture made up of one central coordinating council, three community councils, and a set of sectoral ministerial bodies. ASEAN's coordinating council oversees agenda setting for ASEAN summits, coordinating the implementation of agreements and ensuring policy coherence across issues. The coordinating council meets at least twice a year and involves all foreign ministers of ASEAN member countries. The three sectoral community councils are organised around ASEAN's three pillars—Political-Security, Economic, and Socio-Cultural—and in charge of coordinating the work of the sectoral bodies within their scope of action. Finally, the ASEAN Secretariat—the only permanent body of ASEAN—itself works as a coordinating agent helping to facilitate the adoption and implementation of shared frameworks and policies across members.

Industrial policy coordination within ASEAN is supported by additional initiatives such as the ASEAN Industrial Cooperation Scheme (AICO), which aims to promote joint manufacturing between ASEAN-based companies. Moreover,

although it has historically relied on consensus-based decision-making, it recognises the necessity of additional institutional flexibility in economic matters. Thus, Article 21.2 of the ASEAN Charter establishes that “in the implementation of economic commitments, a formula for flexible participation, including the ASEAN Minus X formula, may be applied where there is a consensus to do so”. ASEAN Minus X is a formula that allows a subset of countries to move forward with a specific agenda while leaving open the possibility for others to join down the line.

Overall, the ASEAN model embodies the idea of “soft coordination”. The primary role of regional institutions is to coordinate action, reduce information asymmetries, facilitate consensus building and coalition formation (Abbott & Snidal, 2003; Börzel, 2011). It lowers coordination costs while maintaining institutional flexibility which itself facilitates political commitment. Thus, ASEAN’s councils’ system is, arguably, better suited to regions with significant political and economic diversity, as it enables countries to align their strategies without requiring deep political commitment. On the economic front, ASEAN has succeeded in supporting regional initiatives in different areas such as standards harmonisation, infrastructure integration, and investment promotion (Dent, 2016; Hill & Menon, 2014).

However, the ASEAN model also presents several challenges. Most notably, the architecture of ASEAN limits its transformative capacity. Thus, a number of initiatives remain performative, with limited de facto impact (Ravenhill, 2017). By and large, deep coordination of industrial policy has been limited. Thus, countries have tended to build industrial policies that are targeting similar sectors rather than actively looking for building productive complementarities. With regard to green industries in particular, progress has been slow and limited to exploration rather than concrete action (Albertone et al., 2025), and cross-border infrastructure projects face persistent financing barriers. ASEAN’s model relies on voluntary national contributions, which makes it difficult to finance large-scale green industrial projects that require long-term, coordinated investment and patient capital (Anzolin & Lebdioui, 2021).

Minilateral Coordination: Lessons from Airbus’ Negotiated Division of Labour

Minilateral coordination represents the most selective model of regional cooperation. In industrial policy, this model is particularly attractive in contexts where broader coordination is politically unlikely to happen. The history of Airbus is an emblematic case of industrial policy coordination at the minilateral level, that is, through a coalition of the willing around specific projects or sectors.

In the late 1960s, European national players were increasingly faced with the risk of becoming uncompetitive or being relegated to the margins of the aircraft market. Individual companies, such as France's Sud Aviation, Germany's Dornier and Messerschmitt-Bölkow-Blohm, and United Kingdom's Hawker Siddeley and British Aircraft Corporation had all pursued independent development and innovations programmes, but none of them had the scale of their American counterparts (i.e., Boeing, McDonnell Douglas, or Lockheed). In response, political leaders from France, Germany and the United Kingdom agreed in 1967, 'for the purpose of strengthening European cooperation in the field of aviation technology and thereby promoting economic and technological progress in Europe', 'to take appropriate measures for the joint development and production of an airbus' (Slotnick, 2020).

The most important barrier to the Airbus project was the necessity for governments to agree on the division of labour and specialisation among their national firms and territories. Thus, a key dimension of the story of Airbus is the role of Roger Béteille, a French aeronautical engineer appointed as Technical Director of the A300 program in 1967. Indeed, Béteille was at the heart of the *negotiated division of labour* that made Airbus possible. Working closely with Felix Kracht-Airbus's first production director-he crafted what came to be known as a 'work-share agreement', that is, a proposal for the distribution of productive specialisation across partnering countries (Morgenstern and Schulz, 2004).

Béteille played the role of a coordinating agent who, through his deep knowledge of the industry, was able to articulate a technical vision that made sense both from a supply-chain perspective and in allowing countries to understand and negotiate the scope of their gains from the cooperative arrangement in the form of large-scale investment, technological learning, and risk-sharing across national boundaries (Niosi & Zhegu, 2005). By explicitly negotiating the allocation of benefits, Airbus reduced the risk of asymmetrical outcomes and maintained trust among partners.

The limitation of minilateralism lies, first and foremost, in its scale and scope. For this very reason, it is useful to think of the Airbus example as a concrete and sectoral example of what a larger plurilateral arrangement could achieve across different industrial sectors. As we will see in the next section, thinking jointly about the lessons of both the ASEAN coordinating system and Airbus is particularly enlightening to envision an effective institutional form of the coordination of industrial policy.

4. Introducing a New Model of Coordinative Optimisation based on triple flexibility and coordinating agents

4.1 Triple Flexibility of Coordination Systems and the Question of the Hegemon

The first critical aspect drawn from the historical experiences reviewed in section 3 relates to the need for flexibility. In the way that ASEAN does not impose a single industrial strategy or policy template, the idea of providing flexibility in the anticipation of necessary adjustments is consistent with evolutionary and institutionalist theories of development, which emphasise diversity, experimentation, and policy learning over uniformity (Sabel & Zeitlin, 2012; Lebdioui et al., 2026). In the case of regional coordination of industrial policy, we argue that institutional flexibility can be conceived and practiced along three dimensions: compositional, longitudinal and directional (see Table 3).

Table 3: Varieties of Institutional Flexibility

Flexibility in Participants (Compositional Flexibility)	Flexibility Over Time (Longitudinal Flexibility)	Flexibility in the Agenda (Directional Flexibility)
<i>Some regions are characterised by significant diversity in economic development, political systems, and economic ambitions. Compositional flexibility allows the coordinating institution to adapt coordination arrangements to countries' specific contexts and needs, ensuring that all participants can engage to the extent they are comfortable without jeopardising collective goals.</i>	Longitudinal flexibility ensures that regional coordination mechanisms can accommodate changes over time. It describes the capacity for adjustments in commitments and strategies as national circumstances evolve. This is particularly important in a region where political cycles are volatile and uncertain.	The dynamic nature of industrial policy demands mechanisms that can adapt to rapidly evolving technologies, market conditions, and global climate commitments. Directional flexibility ensures that regional coordination frameworks can pivot as new market opportunities and challenges emerge. This kind of flexibility not only helps countries adopt the right regional strategies but also shapes markets in ways that align with their interests.

Those three types of flexibility can not only be self-reinforcing but can also heavily influence each other. When it comes to directional flexibility, it must be stressed that not all sectoral directions are equal. There are common and shared interests for sectoral coordination and supply chain development that reinforce the gains from -and subsequent of- regional coordination , or what Keohane & Victor,

(2011, p. 9) term '*institutional linkages*': '[m]any issue-areas lend themselves to linkages as a way to enlarge the scope for deal-making, which encourages integration'. Thus, an aspect of institutional flexibility is to be designed in such a way as 'to encourage linkages that increase the gains from cooperation and strengthen the incentive for compliance' (ibid.).

Lastly, when it comes to compositional flexibility, it is worth raising the question of the presence, in a given region, of one or several natural hegemonic powers in leading regional coordination efforts. The presence of regional hegemons does not necessarily prevent regional cooperation. As Pedersen (2002, p. 678) writes 'in a number of regions, where institutionalisation has succeeded, there has been a significant resource asymmetry within the confines of a unipolar system with the initiative for regional institutionalisation coming from the biggest power in the region or from a duopole'. The successful formation of regional institutional mechanisms, he argues, can principally be explained via the concept of *cooperative hegemony*. The role of China in East Asian supply chain development can be understood in that light. Meanwhile, regional coordination in Latin America is hard to conceive without proactive leadership from the government of Brazil. Cooperative hegemony, Pedersen (2002, p. 684) explains, relies on three major pillars: 'the capacity for power-sharing vis-à-vis smaller states in a region, for power aggregation on the part of the predominant regional state(s), and for commitment to a long-term regionalist policy strategy'. To this, we should also add the capacity, highlighted just above, of inducing development in smaller nations. Thus, by increasing the potential scale of benefits and change that could be achieved through cooperation and coordination, by helping to provide a long-term vision, the presence of a hegemon, can foster rather than hinder the institutionalisation of regional industrial policy.

4.2 Coordinating Agents for the '*Negotiated Division of Labour*'

The question we must now ask is the question of how nations can develop a shared understanding of specialisation that benefits each country and a region as a whole? This, indeed, is arguably essential to both clarify the *perception* of mutually beneficial coordination and to dissipate the 'shadow of the future' (see section 2.4). In other words, what institutional arrangements best facilitate the kind of agreements that took place in the Airbus case, but for a wider range of issues and a more diverse set of countries?

The complexity of this problem makes it an ideal candidate for analysis through the lens of complex systems thinking. It involves thinking about *cooperative optimisation* between multiple actors (countries, firms, or industries) and their decisions within a regional framework.

Below, we explore the issue through the framework developed by Mengdi Wang in a 2015 paper titled “Vanishing Price of Anarchy in Large Coordinative Nonconvex Optimization”. Wang’s model provides a useful framework for understanding how to coordinate the action of individual participants so that, in aggregate, their specialisations align to achieve near-optimal regional outcomes.

The relevance of Wang’s model lies in that it shows how strong coordination can yield near-optimal outcomes even when individual participants face nonconvex decision problems, that is, decisions are discrete (i.e., build or not build) rather than continuous and often involve high fixed costs and/or economies of scale. In the context of regional industrial policy, the *fallacy of composition* arises when each country, acting in its own self-interest, chooses a strategy that appears locally optimal but collectively leads to inefficiencies or misalignment. In game theory, this leads to what we have already defined as the *price of anarchy*, a concept that provides a useful metric for understanding the trade-offs between self-interested decisions and coordinated outcomes.

The price of anarchy is defined as:

$$\text{price of anarchy} = (\text{value of purely self interested outcome}) - (\text{value of truly optimal outcome})$$

Translated into the terms of our discussion, this gives us the following equation:

$$\text{price of non coordination} = (\text{value of national interests}) - (\text{value of optimal regional coordination})$$

This insight is particularly valuable for coordinating green industrial policy in a regional context where the price of anarchy is arguably high. In the context of green industrial policy, Wang’s model can be adapted as follows:

- i. *Participants*: Countries or major industrial players in the region.
- ii. *Decision Set*: The set of possible strategies for each country when it comes to green technology production or adoption, such as investing in solar panel manufacturing, building battery factories, or expanding wind turbine capacity. These strategies can be discrete or continuous.
- iii. *Preference/Cost*: A nonconvex function representing each country’s internal cost or payoff for a particular specialisation (e.g., lumpsum investments, stepping up to new technology platforms, or discrete “adopt/do not adopt” decisions).

- iv. *Impact*: A measure of how each country's choice affects regional resources or supply-chain factors, such as total emissions, region-wide capacity for critical inputs, or the availability of intermediate goods.
- v. *Region-Wide Objective*: A function representing the region's collective goal, such as minimising net pollution or maximizing green industrialisation or climate impact reduction, which depends on the sum of each country's contributions.

The central challenge is to coordinate the choices of individual countries so that the region-wide objective is optimised. Following Wang (2015, p. 18), this can be achieved "as long as the participants are cooperative and a central decision maker properly coordinates the individuals' behaviors". One essential aspect of a problem thus is the institutional form that could contribute to its solution. In thinking about this question, it is important to recognise that a "[c]oordination problem is essentially an approximate projection problem" (Wang, 2015, p. 15). What is required is a central coordinating body to set overarching targets and facilitate information sharing among participants. The coordinating body does not need to dictate individual decisions but instead collects each country's feasible "best responses" and orchestrates a coherent set of actions that minimise total system cost and maximise region-wide outcomes. Thus, the coordinator functions as an "information broker" that systematically collects, aggregates, processes distributed information and presents feasible coordination options to sovereign participants.

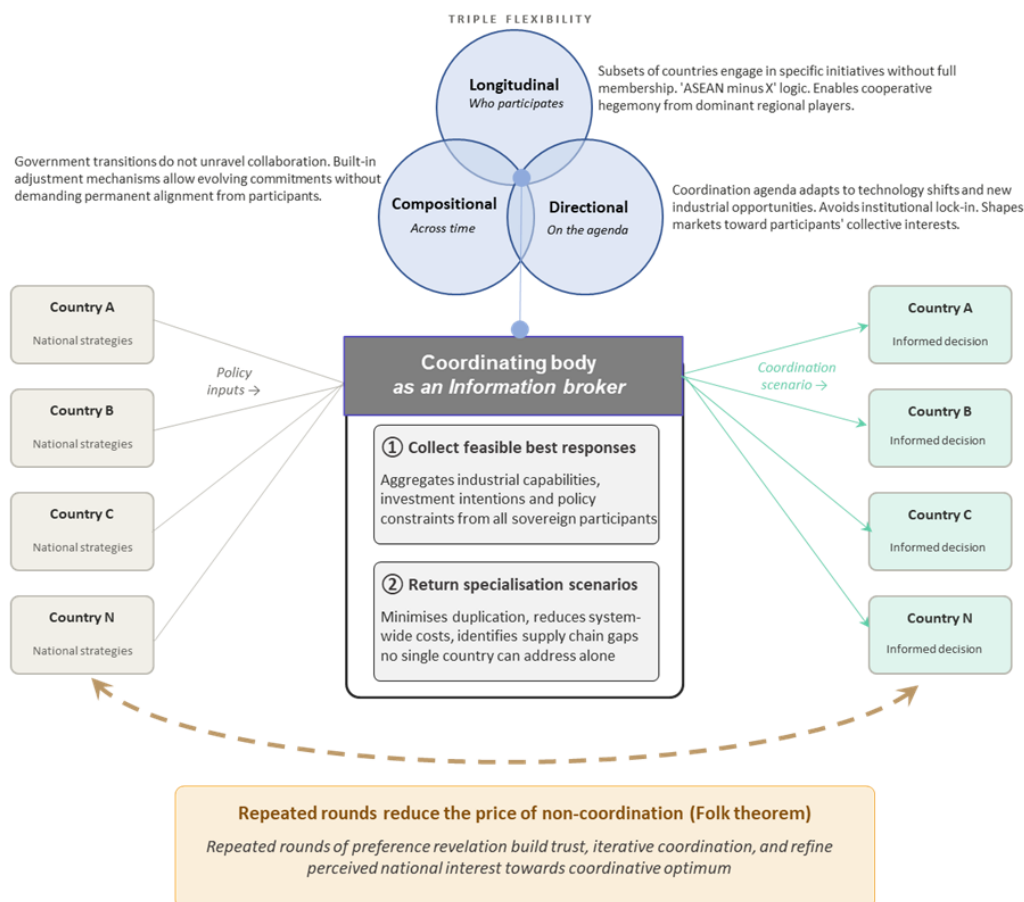
Another key insight deriving from this proposed model is that coordination does not necessarily involve imposing a top-down plan, nor just waiting for each country's final choice. Instead, optimal coordination implies collecting each country's feasible "best" actions and then helps share information that helps orchestrate who invests in what (possibly supporting a cross-border supply chain plan). Each country/participant can have multiple local solutions that yield the same private cost but only a subset of them will collectively yield near-optimal regional outcomes. As such, this type of coordination involves individual participants (countries or firms) ultimately making their own informed decisions in a way that would align with both their own interests and the region's collective goals. The role of the "coordinator" would thus ultimately consist of two principal positions: that of a (i) collector of best "responses"/ green industrial policies from all countries, and that of (ii) a facilitator of best policy responses/sectoral specialisations from each country in a way that minimises total system cost and maximises region-wide welfare and supply chain resilience.

4.3 The folk theorem meets regional industrial policy: supply chains optimisation to bridge national industrial interests with collective gains

The iterative nature of the negotiating process is a key factor of cooperation. The coordinating institution is more effective if its institutional layout allows for repeated rounds of information revelation and preference adjustment. This is also known as the Folk Theorem, i.e., the principle that repetitive interactions increase the likelihood and sustainability of cooperation.

The councils would provide opportunities for countries to interact repeatedly across multiple sectors. Countries would submit assessments of their industrial capabilities, investment intentions, and policy constraints. The coordinating body would be in charge of generating specialisation scenarios showing the distribution of benefits and costs across participants. This structure would allow countries to observe how different coordination arrangements could fit with their national productive ambitions while gaining knowledge about their neighbours' own plans.

Figure 2: A Model of Coordinative Optimisation for Regional Industrial Policy



5. Conclusion: From the Prisoners' Dilemma to Pacts of Productive Complementarities

This paper started from the recognition that the pursuit of unilateral (green) industrial strategies risks duplicating efforts, incentivising beggar-thy-neighbour behaviours and ultimately failing to achieve the scale economies that make advanced green technologies competitive.

The paper has made two important contributions in response to this diagnosis.

First, we problematised the variety of institutional mechanisms that could support industrial policy coordination at the regional level. We proposed a three-level typology. Supranational coordination, illustrated by the EU, maximises the theoretical gains from cooperation but carries the highest coordination costs. Plurilateral coordination, in turn, provides a more flexible institutional arrangement but struggles to enforce the commitments needed to build complementary industrial policies across borders. Minilateral coordination, finally, as illustrated by the case of Airbus, has the potential to support genuine industrial coordination but remains inherently limited in sectoral scope.

Second, drawing on this diagnosis as well as on complex systems theory, we delineate our own institutional proposal: a coordinating body that would serve as an information broker, collecting preferences and capabilities information from participants, and returning specialisation scenarios aimed at minimising duplications, and identifying supply chain shortfalls. This model recovers the institutional logic that drove Airbus, that of a negotiated division of labour, while extending it to a more diverse set of countries and sectors.

Several implications follow from this analysis. The most urgent is that regional coordination is not a second-best substitute for integration into global value chains but a precondition for achieving genuine developmental gains. A second implication concerns the importance of going beyond old models of regional cooperation. One of the recurring causes of failure in regional integration projects has been the conflation of regional cooperation and supranational integration. The model proposed in this article is deliberately designed to avoid this conflation. It argues that regional coordination is a prerequisite for regional integration, and not the other way around. This reframing, we argue, offers a more politically viable foundation for sustained cooperation among governments that face strong domestic constituencies and rapid electoral cycles.

One major limitation of this paper is that it operates at a relatively high level of abstraction. Thus, an important task for future research is to empirically explore how that model could fit specific regional contexts, be used to explore sector-specific coordination challenges. This is a substantial and urgent research agenda, and this paper has only laid some initial conceptual reflections.

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