

Existing Problems and Countermeasures of Industry-University-Research Cooperation

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Abstract: To accelerate the high-quality development of the county economy, it is necessary for the government to make overall arrangements and actively guide, for universities to accelerate the transformation of scientific research results, and for enterprises to stimulate the spirit of innovation and contractual spirit, to build a tripartite cooperation platform, and to promote the in-depth integration of industry-university-research co-operation. This paper discusses the problems of all parties in the process of industry-university-research cooperation from five levels: power, platform, financing, mechanism and organisation, and puts forward corresponding countermeasures to provide reference for relevant enterprises and units.

Keywords: Industry-university-research cooperation, Deep integration, Industry-university-research problems and countermeasures.

1. Current situation

The Party pointed out in the report of the 20th National Congress that "high-quality development is the primary task of building a modern socialist country"[1], and the central government emphasised the development and expansion of the county economy, the improvement of the industrial layout of the county and countryside, and the realisation of a strong county and a rich people in the No.1 document issued in 2023[2]. The county economy is the basic guarantee to promote rural revitalisation and regional development, while the cooperation between industry, academia and research is an important support for the high-quality development of the county economy[3]. To achieve high-quality development of the county economy must be based on the present to strengthen the innovation-driven strategy, increase efforts to overcome the core technology, promote the cooperation between industry, academia and research and achieve in-depth integration, to help scientific and technological achievements incubation and transformation to form an industrial chain[4] [5]. In order to implement the spirit of the twentieth CPC National Congress, promote the cooperation between industry, universities and research institutes to promote the high-quality development of the county economy, the local government closely combined with the industry, universities and research institutes between the advantages of resources, give full play to the technological innovation of colleges and universities and research institutes, research and development, and platform advantages, to help enterprises to crack the technological difficulties, and to promote the in-depth cooperation between colleges and universities and key enterprises[6-8]. In the process of cooperation between the parties involved in industry-university-research, the problems of insufficient cooperation motivation[9], low enthusiasm for cooperation and mutual distrust are increasingly exposed[10] [11]. The reason for this is that the goal orientation of the three parties is not the same, coupled with multiple conflicts in culture and philosophy, it is difficult to achieve the University-Industry-Research co-operation in one go[12-14]. In this regard, this paper clarifies the problems and short boards in the industry-university-research co-operation, and

puts forward corresponding countermeasures and suggestions according to the problems and short boards, to create conditions for the in-depth integration of the industry-university-research co-operation, in order to promote the high-quality development of the county's economy.

2. Existing Problems and Shortcomings

2.1. Industry-academia-research co-operation is not very strong

Intrinsic and extrinsic motivation of the parties involved in industry-university-research co-operation is weak. Universities and research institutes pay more attention to scientific research and technology development, lack of attention to the transformation of research results, or have high expectations for the results but the actual transformation of the application of immature and long cycle. Enterprises pay more attention to the economic benefits brought by the cooperation, and have less confidence in whether the research results of universities or research institutes can be marketed and industrialised as well as whether they can produce benefits, and have little willingness to invest in the projects in the preliminary research and development of universities, and are more inclined to invest the funds in expanding the reproduction in order to avoid the risks of the preliminary product development. At the same time, enterprises are more inclined to reach cooperation by signing a package cooperation agreement, which will shift the risks and costs arising from cooperation to universities and research institutes, and ultimately make the three-party cooperation only stay on the surface. In the process of cooperation, all parties consider their own interests, lack of mutual understanding and trust, the lack of endogenous motivation makes more in-depth technical problems can not be solved, can not carry out in-depth and long-term co-operation, and the promotion of high-quality development of the county's economy is insufficient. Although the government actively guides and participates in industry-university-research co-operation, it has not yet formed a systematic mechanism and policy atmosphere, and the external motivation of industry-university-research co-operation is insufficient.

2.2. Industry-academia-research co-operation platforms are not high-end

In the construction of county industry-university-research co-operation platforms, the government plays a guiding role, enterprises occupy the main position, and colleges and universities play the role of foundation and main force. However, the level of collaboration in the construction of county industry-university-research co-operation platforms is not high, and industry-university-research co-operation platforms mainly remain at the lower level of technology transfer, co-development and commissioned development. The cooperation is too limited to the local city, only relying on the local institutions, and lack of diversified and high-end cooperation objects. At the same time, the depth of the county industry-university-research co-operation platform construction is not enough, in the government-led, universities to provide scientific research support, enterprises to provide funding for the co-operation platform mode, enterprises are more inclined to short-term and quick projects, the development of the industry is not enough to care about the key technologies and common technologies. As a result, the platform cooperation only stays in the short term, and enterprises will give up the cooperation when they cannot receive the expected benefits, which leads to a large number of potential projects remaining in the laboratory and academic level, and unable to transform the results to form an industrial chain.

2.3. Poor financing for industry-university-research co-operation

There is a wider demand for industry-university-research co-operation, but co-operation funding is scarce and comes from limited sources, universities generally lack pilot bases due to insufficient funding, and the majority of SMEs lack funding for science and technology and development. After universities and research institutes have researched results, enterprises start the process of transforming the results, but in the process of transformation often need to bear high risks, enterprises hope that the government or other parties can share the risks. While the government is trying to expand publicity and build a platform to promote enterprises through the declaration of scientific and technological projects to lead with industry-university-research co-operation, but the capital investment is crucial, many enterprises due to their own business conditions of technological transformation and R & D investment is relatively small. At present, the government, enterprises and financial institutions have not yet formed a diversified investment and financing system, and the University-Industry Research Base is generally invested by universities and local governments to build, if the initial cultivation period can not achieve self-blood-supporting, and later need to increase the cost of the capital problem will be exposed, but also become the development of University-Industry Research Cooperation obstacles to the development of the local economy is not conducive to the high-quality development of the local economy.

2.4. Inflexible mechanisms for industry-university-research co-operation

The county industry-university-research co-operation mode lacks flexibility. Most of the local co-operation modes exist in the form of scientific research projects or commissioned research, but the local co-operation procedures

for this mode of co-operation are more complicated and the co-operation time is longer, requiring the co-operation parties to share the risk for a long period of time, and there is a lack of more flexible co-operation modes, which are not able to adapt to the fast-changing needs. At the same time, the management and coordination of University-Industry-Research cooperation is not flexible. University-Industry-Research cooperation needs to be managed and coordinated by the government and other institutions and personnel, but the different working styles and cultural differences of the parties will have an impact on the cooperation, and in addition, the application procedures for funding by the parties are too cumbersome, which will further impede the smooth progress of University-Industry-Research cooperation.

2.5. Inadequate industry-university-research co-operation organisations

The county industry-university-research co-operation requires that all the participants can form a stable cooperative relationship and trust each other, and cannot only consider short-term interests and neglect long-term development, while the current form of industry-university-research co-operation organisation is difficult to adapt to these requirements, and there are some organisational deficiencies. Firstly, the relevant departments to promote University-Industry-Research Cooperation are not perfect and have not yet formed a systematic organisation, the staff within the organisation is understaffed and not professional enough, the cooperation between members is not smooth and the working mechanism is not perfect. Secondly, the organisational form of University-Industry-Research Cooperation is relatively loose. There are many cooperation agreements among enterprises, governments and universities, but the rights and responsibilities of each party are vaguely defined, and the cooperation relationship lacks legal constraints; due to the long period of cooperation, the implementation of the contract is poor, and there is a lack of organisations to maintain a positive, efficient and sustained cooperation relationship. Thirdly, the system of University-Industry-Research Cooperative Organisation is not sound, the relevant system of University-Industry-Research Cooperative Organisation has not yet formed a system, and the policy environment is yet to be perfected, for example, the protection of intellectual property rights of the core technology of research and development, the distribution of benefits, taxation, and other aspects of the system have not yet formed a complete system of laws and regulations. At the same time, the government's orientation in the system, such as taxation, personnel, assessment and other aspects of the orientation is not clear to be improved, so as to mobilise the enthusiasm of all parties to cooperate, and to promote the high quality development of the county's economy.

3. Countermeasures and Recommendations

3.1. Encouragement and guidance to create a synergy-driven system

For industry-university-research co-operation to take an active encouragement and guidance approach, strengthen internal and external drive to create a synergistic drive system. One is to carry out a hand into the university activities, strengthen the link between the government and universities, and activities into the town (street), the department of the end

of the year target responsibility system assessment, but also can set up subsidies, to solve the universities in the industry-university-research co-operation faced by the lack of funds and other problems, to increase the power of co-operation and enthusiasm. Second, adhere to the regular in-depth inspection of enterprises, around the school-land symbiosis, the integration of industry, academia and research work, in technology, talent, financing and other aspects of the demand for mapping research, the formation of enterprise demand list and timely docking with the university, to solve the problems within the enterprise, to enhance the power of enterprise cooperation. Third, to promote the process of cooperation between industry, academia and research actively introduce a series of policies to encourage and guide all parties to promote the realization of in-depth integration, to create a good environment for cooperation between industry, academia and research.

3.2. Strengthen Collaboration and Build A High-end Cooperation Platform

Strengthen the cooperation among universities, enterprises and the government, and at the same time, break the spatial barriers for horizontal cooperation and build a diversified platform for high-end cooperation. First, accelerate the development of small and medium-sized enterprise growth plan, actively build high-tech enterprises, promote the rapid growth of local high-tech enterprises and small and medium-sized enterprises, and further establish practical training bases with colleges and universities, two-way talent training, and jointly carry out the project research and development, and other ways to build the university-enterprise reciprocity, common development of the University-Industry-Research cooperation platform. Second, attach great importance to the cooperation between industry, academia and research, a hand to lead the leadership of the relevant departments responsible for the cooperation between industry, academia and research, the main person in charge of the town (street) and the local enterprise representatives to go to the universities in foreign provinces to study and exchange, and actively put forward the intention of cooperation, and the establishment of cooperation between the industry, academia and research with the universities in foreign provinces, to expand the platform of cooperation and promote the development of provincial or national cooperation platform and key technology development, the formation of a high-end platform of cooperation. Thirdly, we organise medical, education and other systems of talent and private entrepreneur representatives to visit and study in foreign provinces industry-university-research cooperation platforms, and jointly carry out symposiums with industry and commerce, relevant county departments, township and street personnel and enterprise representatives to discuss school-enterprise cooperation and other related matters, to form a strong working synergy and to jointly build a diversified and robust industry-university-research cooperation platform.

3.3. Broaden Vision and Build A Diversified Investment and Financing System

The construction of the financing and investment system requires the support and collaboration of all parties involved in industry-university-research co-operation, so as to build a diversified investment and financing system and a more perfect risk investment mechanism. Firstly, it is to solidify and expand the existing inputs from universities, government

inputs and enterprise R&D inputs. The second is to take the way of equity, through the market to raise, operate, and actively introduce banks, venture capital, insurance and other financial capital, so as to establish a multi-faceted investment and financing system combining enterprise as the main body, the government to guide and drive, the market as the guidance, and the financial capital in the society. Thirdly, it integrates all kinds of special funds for scientific and technological development, provides financial support for industry-university-research co-operation in the form of subsidies (such as loan subsidies and matching funds), loans, etc., and guides the direction of the use of the funds through various industrial policies and regional policies.

3.4. Strengthening Regulation and Forming Flexible and Efficient Cooperation Mechanisms

The county government has increased its control and adjusted the co-operation mechanism in the process of cooperation between industry, universities and research institutes, abolished the long and cumbersome co-operation process, and formed a precise, flexible and efficient co-operation mechanism. Firstly, after the parties of industry-university-research signed the project cooperation or entrusted research and other cooperation, give full play to the initiative, organise the leadership team to conduct inspection and research, examine the progress of the cooperation and factors affecting the progress of the cooperation, look for the needs of the parties and give guidance and policy concessions, and give the enterprise confidence and point out the direction of the future development, which will promote the cooperation of the industry-university-research to be more close. Secondly, we should regularly go into the enterprises to understand the needs of enterprises and the problems in cooperation. Due to the differences in working methods and environmental culture among different cooperation subjects, the government should give full play to its leading role and subjective initiative to accurately understand the needs of the enterprises and dock with the universities in time, so as to promote the mutual integration of different subjects and reach an efficient and comfortable co-operation. Third, the establishment of a monitoring department, in view of the situation of University-Industry-Research Co-operation, regularly arranging for commissioners to go into universities, enterprises, towns (streets) to understand the progress of University-Industry-Research Co-operation, learn from grassroots personnel about the obstacles in the process of co-operation, and investigate whether there is any problem of slow co-operation caused by the lengthy review process, so as to ensure the flexibility and efficiency of the co-operation mechanism.

3.5. Synergistic Promotion and Sound Organisational Structures and Systems

The county industry-university-research cooperation is still in the exploratory stage, so it is necessary to strengthen the tripartite synergy, improve the departmental and personnel structure among the cooperation organisations, and form a perfect institutional mechanism. Firstly, establish a perfect organisational structure of industry-university-research cooperation, including working institutions, service institutions, model units of industry-university-research, model enterprises of industry-university-research, expert advisory committees, and innovation alliance of industry-

university-research, etc., of which the working institutions include the office department, liaison department, research department, publicity and training department, cooperation and exchange department, conference and exhibition department, and information network department, to form the system of the organisational system of the production-university-research cooperation, and appoint professionals as members within the organisation in a We also appoint professionals as members of the organisation through examination, internship and other means to improve the organisational structure. Secondly, we should strictly define the rights and responsibilities of all parties involved in the cooperation, clearly define the content of the cooperation to ensure the interests of all parties, and strictly implement the requirements of the cooperation to avoid infringing on the interests of other parties or the problem of inter-organisational looseness. The third is to increase the regulation, based on the existing national industry-university-research co-operation planning and related policies, actively organise local surveys, deeply analyse the current situation and problems of local industry-university-research, and introduce the system mechanism and related rules for promoting industry-university-research co-operation for high-quality development of the county's economy based on the existing experience. Starting from the establishment of legislative protection for industry-university-research cooperation and the strengthening of government support for industry-university-research cooperation, it will establish institutional mechanisms applicable to local industry-university-research cooperation organisations and solve the institutional bottlenecks of all parties in the cooperation, so as to promote synergistic optimisation of the system and promote the high-quality development of the county's economy.

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