Abstract

Knowledge has become a strategic resource for economic development in a knowledge-based economy. The globalization, networking, and informational society have accelerated the arrival of the era of open cooperative innovation further. University and enterprises have gradually become the main R&D subjects in the national innovation system and play a crucial role in economic development. However, the imbalance of regional university-industry (U-I) collaboration in China restricts this type of effect. How to shorten the "distance" between university and enterprises enhancing the efficiency knowledge flow from university to enterprises for innovation? A proximity approach gives us a new view to understanding U-I linkages. Therefore, this research aims to explore the spatial trend, different influential factors from proximity perspective on knowledge flow from university to enterprises and proposes two types of strategies through entrepreneurship education and region-industry linkage to foster the U-I knowledge flow drawing on the national innovation system, the new knowledge production mode, and triple helix theory. The thesis is organized as following:

Chapter 1, the research background, research meanings, main research questions and research framework were introduced.

Chapter 2, the literature on U-I collaboration, knowledge flow and proximity were reviewed.

Chapter 3 and chapter 4, to find the rule of spatial trend from university to enterprises, we should understand how the knowledge flow. Therefore, this research construct a framework of knowledge flow on U-I collaboration and explore the flow mechanism on two stages of knowledge outflow and inflow from proximity perspective. Then, the trend of inter-regional U-I knowledge flow with 7,994 co-invent patents by university-industry over the period 2013 to 2018 in China were illustrated.

Chapter 5 and chapter 6, this research will discuss what types of proximity impact on knowledge flow by cross-level perspective with embedding absorptive capacity into outflow and inflow stages to cross regional and organizational boundary. Firstly, we used 484 pairs of patents to test the proximity effects on the regional U-I innovation performance. We further verify the catch-up moderating role of regional internal and external absorptive capacity, focusing on the U-I collaboration from non-local universities to local regions that significantly impact lagging regional U-I collaborative innovation performance.

Following this analysis, paying attention to the organizational boundary, the research tests the mediating role of knowledge embeddedness and moderating role of enterprises absorptive capacity. The findings rich triple helix theory from the subjects side which considers the integrated resource endowments in the triple helix research framework and fosters the knowledge flow activities between university and enterprises.

Finally, in chapter 7, we emerge two types of strategies: one is from entrepreneurship education as a means for fostering U-I knowledge flow and the other is region-industry linkages development pathway. These expand in-depth analysis of the impact of proximity, innovation performance, and regional resource endowments on U-I knowledge flow.

Then, we got the results from the following three aspects:

As for flow "spatial trend", the gaps between regions in China are obvious, showing a spatial pattern of "strong in eastern and weak in the other areas". The inter-regional U-I collaboration makes an increasing trend, however, most of the new co-patents flow into prosperous provinces. There is a ladder shape of imbalances development on U-I collaboration in prosperous and lagging regions.

For "influential factors" of flow form universities to enterprises, (1) The long geographic distance is not a hamper for improving regional and enterprises innovation performance. The economic development level has no significantly different effects on such role. (2) Technological proximity plays a negative role in increasing inter-region U-I innovative performance, eastern region has the most noticeable results. However, it can foster the enterprises innovation performance. (3) The better relationship and social trust of subjects can get more innovation performance in eastern and western, but the central area negatively affects. Simultaneously, social proximity also can improve enterprises innovation performance. (4) The U-I collaboration for innovation performance-enhancing advantages are not equal for all regions but are moderating by specific regional absorptive capacity dimensions. The areas with a higher level of internal human capital can get more catch-up effects, the knowledge embeddedness helps enterprises shape innovation performance.

For fostering U-I collaboration "strategies", entrepreneurship education integrated with professional education contribute to U-I knowledge flow through fostering students' creative thinking and problem-solving capability. The universities and enterprises located in lagging regions should increase entrepreneurship education, as a means for U-I knowledge flow. And then the regions cultivate the innovation atmosphere to absorb talents fostering cross-regional cooperation for catching up. Region-industry linkages promote the clustering growth, then push the U-I collaboration development. The conclusion section highlights the most relevant findings of this paper and formulates a set of recommendations. These findings can provide theoretical and practical guidance for innovation by real-world university–industry collaboration.

Keywords: Knowledge flow; University-Industry(U-I) collaboration; spatial trend; proximity; innovation performance