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A multi-level and multi-dimensional approach

World cities' system through multinational firms' and cities networks

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The classical approaches privilege either objects like the cities either the MNF, asking what are the support effects of the resources of cities on the development of MNF, and at the opposite side, what are the effects of MNF on the development of cities. Here one object is central and the other one is taken as exogenous variable. Better is to start from the point of view that MNF are a part of the cities' dynamics and vice-versa. The shift is to pass from a mono-dimensional network of cities linked by multinational firms developing some activity sectors to a multi-dimensional network linking MNF, cities and activities. It allows test the role of enterprises strategies on cities transformations, and in the meantime the one opposite of cities transformations on enterprises locations. The hypotheses of interactions and transformations will be built in a "*multidimensional approach*" (Contractor et al., 2011), and being transferred and adapted from other fields like communication science to our urban economic object.

Starting from the 600,000 subsidiaries of the 3,000 first world groups for 2007 and 800,000 for 2010, we'll take some samples in order to precise at different levels (micro (enterprises), meso (cities), macro (systems of cities)) the emergence of networks, the role of path dependence and the consequences for cities positions and dynamic in such patterns (part 1). We'll propose the development of Agent based simulation models adapted at each different level: agents will represent sometimes firms, cities or group of cities, groups of firms or activities (part 2). We'll test some different hypotheses on the transformations of each object (networks of firms, cities, activities) and their repercussions on the whole system. At the level of firms, for example, we'll test the increase or decrease of hierarchical organization. For the cities, we'll test hypotheses of growth or decline of biggest or smallest cities. For activities, we'll evaluate the effect of economic cycles on the development of firms' networks and then on cities and urban systems. Then, we'll compare the results and we'll discuss their possible interactions (part 3).