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Guidelines

Themes of research: ph.d

Activities:

- *Ph.d in Economics under the direction: professor Boughzala Mongi*

- **Research interest:**

Network economics, consumer choice & social network analysis, innovation diffusion, development and environmental policies and Forest Economy

- **Professional activities:**

- *2009 : Member of research Group under the supervision of UNDP-Tunisia, in « Employment dynamics in governorate of Kef and Gafsa: Identifying the opportunities and the problems relative to the creation of new employment .*
- *2005-2009 : Teaching at ESSECT Tunis*
- *2007-2009 : Member of CMCU, program UTIQUE-Tunisia : “TIC and Labor Market”*
- *2005 :Member of the Forum FEMISE, : “Telecommunication sector liberalization”*

The description of the these:

- *Title: the effect of structural properties on the network effects and the individual choice*

- **Theoretical context:**

*Network economics: Network approach
discret choice Model: empirical evidence*

- **3 Steps**
- *Identification of local Network : NCD per users*
- *The simulation of agregate level of Network externalities*
- *The integration of the agregate network effect in discret choice model*

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Introduction : Network; Network externalities,...

- *Every social activity can be considered as network , where the nodes or agents could be, consumers , productors, political partisan, associations members,...*
- ***When we are considering network contexte, we should consider at least two important elements : network externalities and agent heterogeneity***
- ***Network Externalities***
- ***Network externalities broadly defined as the increasing in the individual utility associated with the adhesion of a new individual to the club, his access to the network, his adoption of the new standard... Always there is no big distinction between network effects , network externalities, club effects, but there are different classifications of them , we distinguish principally two categories of positive network effect : direct and indirect network effects.***
- ***Heterogeneity of agents: it can be indicate a difference in individual characteristics or a difference in the personal preferences, valuation or behavior.***
- ***Graph theory and structural properties of the network***
- *The characteristics of the social network are translated using the techniques of the graph theories . So each nodes can be defined by the numbers of his connection (the node degree), and the weights for each relation which translate the strength of the relationship with the other agents .*
- *Recently, many economists, marketers , as done in Mico-biology , emphasized on the rôle of community in the determination and the influence of the individual choice and in consequence in the determination of the global evolution of the demand or the network size.*
- ***Social network analysis :***
- *This tools is imported from social Sciences and psychologie because it can reproduce differente possible interactions between agents forming the population or the sample of study.*

How to evaluate network effects

- *Different models are applied in the diffusion of products*
- *- standard passive diffusion models such as the Bass Model (1969).*
- *- evolutionniste model as the Susceptible –infected model*
- *- dichotomous models , logit , probit, nested logit , Mixed logit*

→The common drawback of these models that they don't take into account of network externalities , and if they did they considered a macro variable , like the variation of the total size of the network without considering any aspect of the composition of the network of users or their structural properties.

the network approach is designed to overcome this limitation. So it is specifically designed to consider the particularity of different types of network and to integrate different forms of interaction among agents. This is supported by the background developed in the Graph theory and the Social network.

But an appropriate application of these new techniques require a very detailed individual database that can be used to construct different measures of the network properties such as the degree distribution which describe the composition of the population by the number of connections of each agent(the node degree), and the strength of ties .. Such database can be used for different purposes : the determination of 'the boundaries of each communities », the rôle of every ties (weak and strong ties), the relative importance of each agent and the influence effect they can create by the « « opinion leaders ..

**the problem is the availability and the accessibility of such database
it is evident that the construction of such database is very difficult.**

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How to evaluate network effects

- ***So what is the solution?***
- ***From Scientist in Computer Sciences and physics who developed many algorithms that can be more flexibles , that need less database.***
- ***From professional such as Google , many other firms (Xtract, Ildiro) which are developing many algorithms to detect influential's which are the key of the viral marketing strategies .***

But even with these options, the application of network models and the SNA remains out of reach because of lacking suitable data for researchers

the remaining option for researchers in universities for example is the simulation techniques. Indeed, Simulations can reproduce different alternatives with different hypothesis about the structural properties such as the density, the numbers of communities and their sizes, clustering coefficient, ...

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Our method to evaluate network externalities

- **Questionnaire : 1000 students → identifying different types of local network (the size ,the composition)**

*Also individual charac., use of TIC technologies (Internet, Mobile Phones,..), their attitude for the 3rd G , the firme strategie (pricing, marketing), **the time of the adoption , the change preferences indicated by switching or mutlihoming choices***

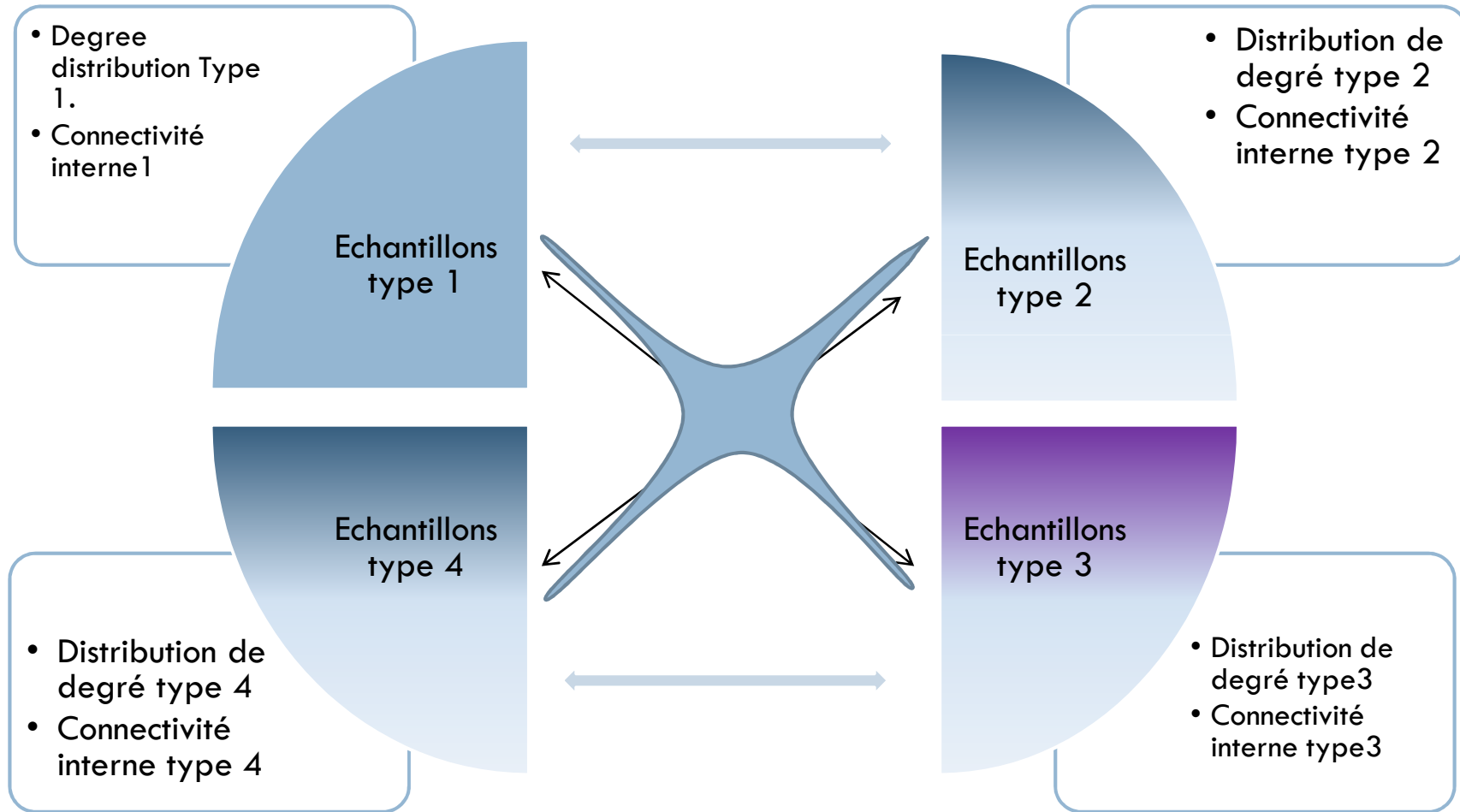
We identified the composition of the population with the disctinction between different type of Local Network

- **The simulation distinguishes different structural alternatives , it consists of 2 types:**
 - **The discret Case:** (the degree can take ongly discret sets) based on the data form the quiery and some parametres like connectivities (inter-clusters), density and scope effectss.
 - **The continous case :** the distribution degree flows power law distribution , the others parameters are parameters .

Genration of agregate Network Effects

- *Two types of agregations are considered:*
- *Horizontal agregation*
- *When considering differents samples with similars characteristics: check the robustesse of resultats relative to specific focus group*
- *Vertical agregation*
- *When considering dissimilar samples in order to treate weighted networks and hierarchal structure: in order generate generic resultats.*

Agrégation multi-level : généralisation des propriétés structurelles pour différentes régions et pour différentes catégories d'utilisateurs.



Future Perspectives

- ***Choice modeling***
- ***Complex models : Agent Based Modeling***
- ***Recreation Model.***

With applications to:

- ***Environmental issues***
- ***Forest Economy***
- ***Industrial economics***
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*Thank you for
your attention*