

# Adjusting the Strength of Intellectual Property Rights to Allow Healthy Competition

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<https://hdl.handle.net/2324/1515809>

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出版情報 : 2015-05-28  
バージョン :  
権利関係 :

# Adjusting the Strength of Intellectual Property Rights to Allow Healthy Competition

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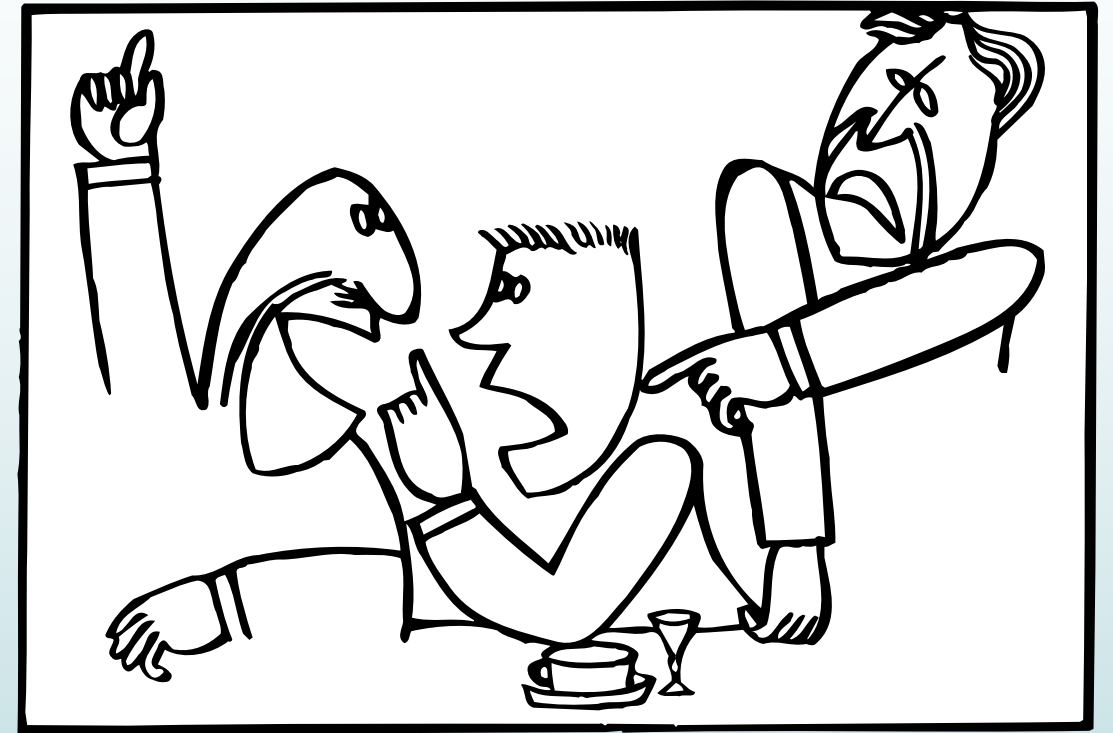
Professor of Law, Kyushu University, Japan

Istanbul University

World Conference on Technology, Innovation and Entrepreneurship

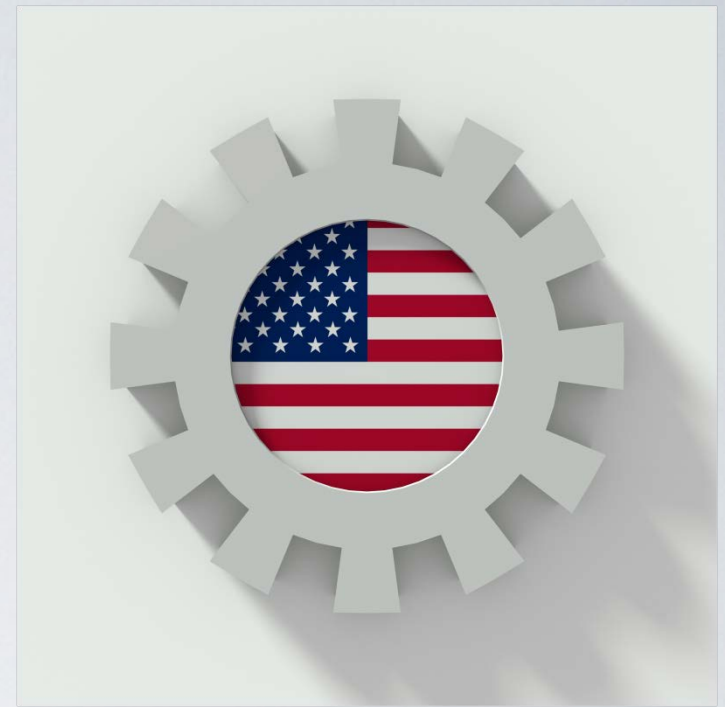
May 28–30, 2015

# Debates on the Pros and Cons of IP Protection



- Does IP protection promote the development of industry?
- Or, does it inhibit the development of industry?
- Are there any particular features of developing countries compared to developed countries that affect the degree of advantage and disadvantage of IP protection in promoting the development of industry?

The experience of the U.S., when it *was* a developing country

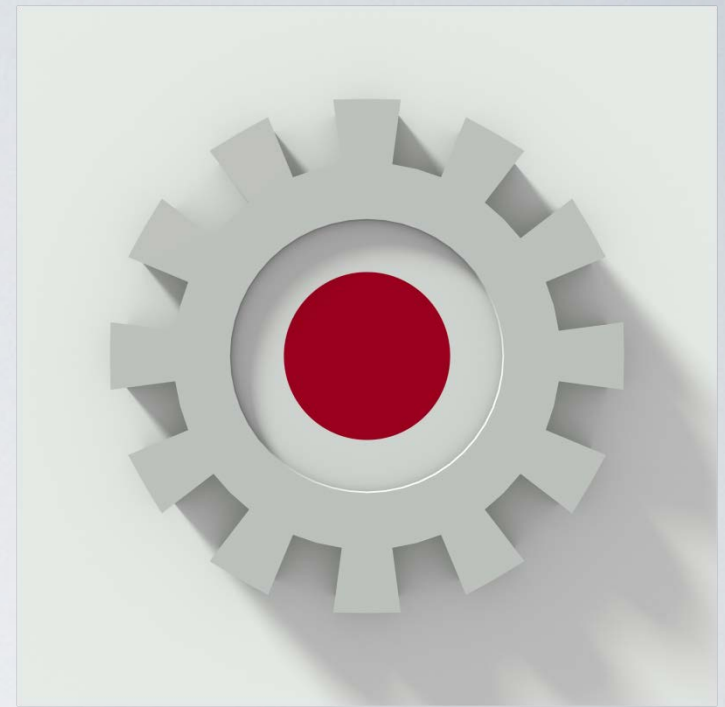


- Until 1891, American copyright law did not protect foreign copyrights.

\* Lessig, Lawrence, 'Dunwody Distinguished Lecture in Law: The Creative Commons' (2003) 55 Florida Law Review 763, 768–769.



The experience of Japan, when it *was* a developing country



- Japan “reluctantly” entered the Berne Convention for the Protection of Literary and Artistic Works and the Paris Convention for the Protection of Industrial Property, both in 1899.

\* The stenographic record of the special committee that examined the bill of copyright act for the lower house of the 13rd Imperial Diet of Japan

Now, both the U.S. and Japan are patent rich countries



“The US was the primary country of origin for filers in 2014, with 61,492 applications and 7.1 per cent growth. Japan followed with 42,459 applications, representing a 3 per cent decline on 2013. Applicants from China filed 25,539 applications – an 18.7 per cent annual increase.” 19 March 2015 UN report. <http://www.un.org/apps/news/story.asp?NewsID=50375#.VTV0gK3tIBe>



# Productive deals are also possible



- TOYOTA decided to license its hybrid system technology to MAZDA (The press release by TOYOTA and MAZDA as of March 29, 2010 ([http://www2.toyota.co.jp/en/news/10/03/0329\\_2.html](http://www2.toyota.co.jp/en/news/10/03/0329_2.html))).
- MAZDA agreed to produce and supply TOYOTA with automobiles powered by Skyactive Technology (The press release by TOYOTA and MAZDA as of November 9, 2012 (<http://www2.toyota.co.jp/en/news/12/11/1109.html>), and the press release by TOYOTA as of March 31, 2015 (<http://pressroom.toyota.com/releases/2015+new+york+auto+show+scion+ia+sedan+debut.htm>)).

# *Eigenvector centrality* as indices of the advantaged and disadvantaged of suppliers

Assuming that a given undirected graph  $G$  has  $n$  number of nodes:

$A$  is the adjacency matrix of  $G$ ,

$a_{ij}$  is an element of  $A$ ; and

$\lambda$  (lambda) is the maximum eigenvalue of  $A$ ,

$C_{ev}(i)$ , the eigenvector centrality of node  $i$ , is calculated as follows:

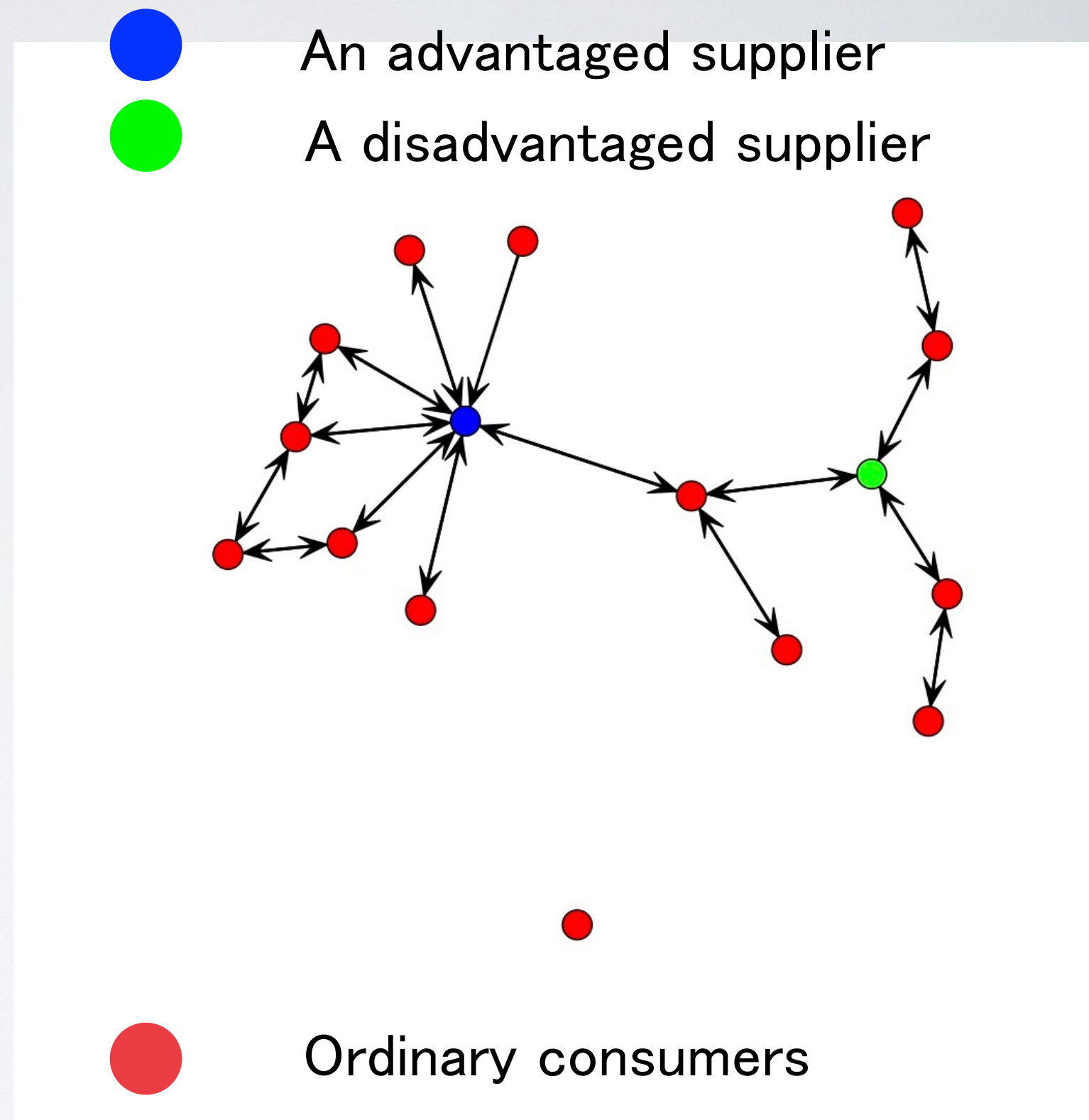
$$C_{ev}(i) = \frac{1}{\lambda} \sum_{j=1}^n a_{ij} C_{ev}(j)$$



# Advantaged and disadvantaged suppliers in the market from the perspective of simple share in the relevant market




- The blue supplier has an advantageous position in this market by connecting itself with a greater number of consumers.

	Eigenvector centrality
	1
	0.1923458

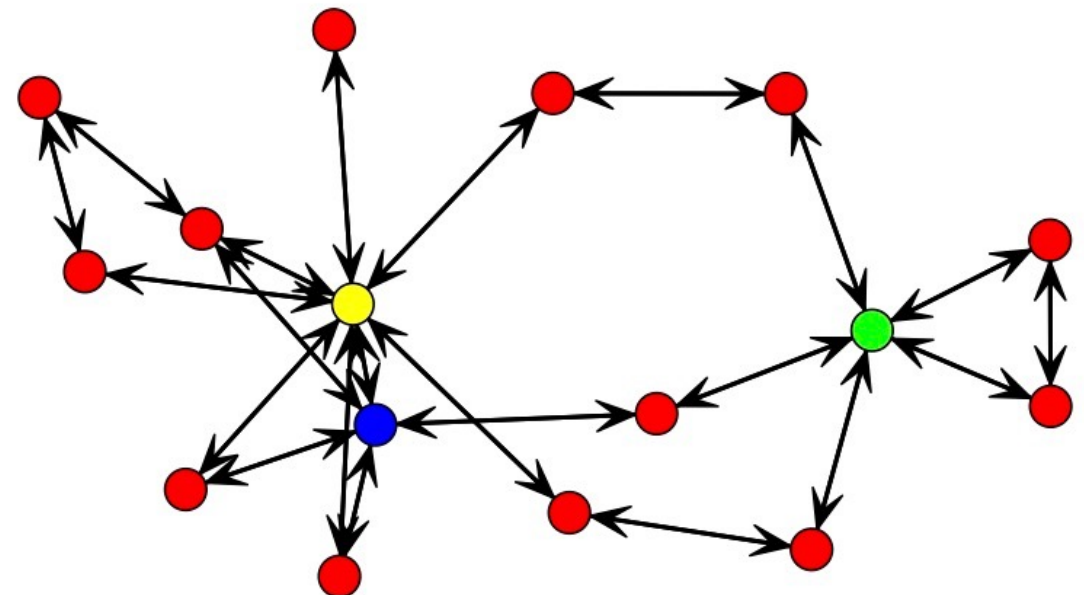


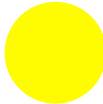

# Advantaged and disadvantaged suppliers in the market from a network perspective

- The blue supplier has an advantageous position in this market by connecting itself with an influential consumer.

	Eigenvector centrality
	0.7855087
	0.196908
	1

-  An advantaged supplier
-  A disadvantaged supplier



-  An influential consumer
-  Ordinary consumers

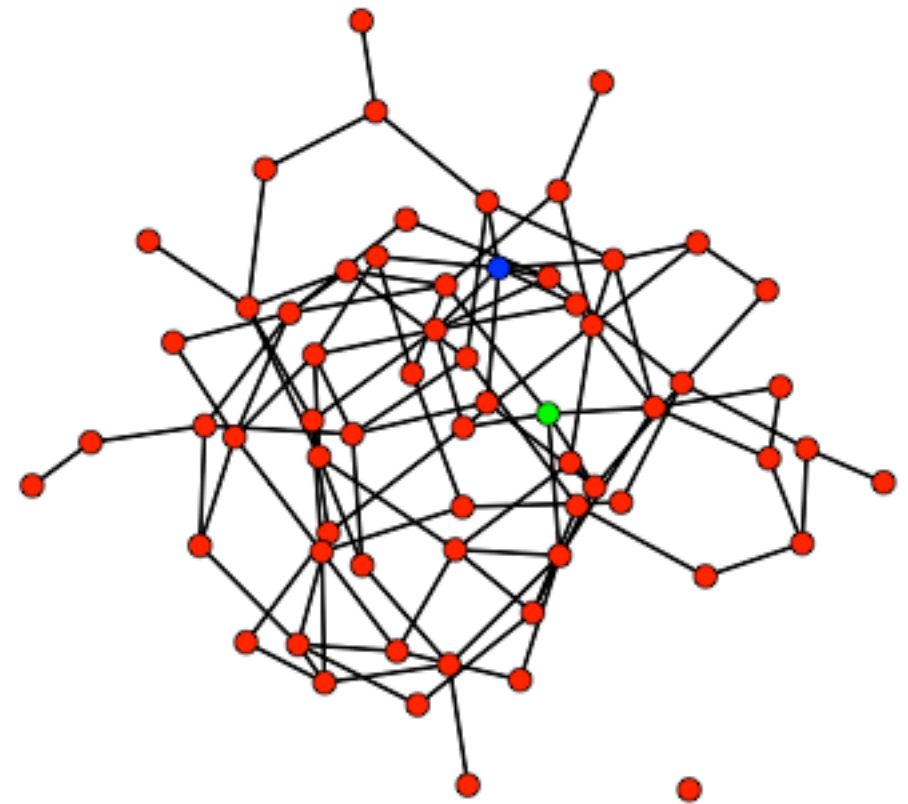


# Designing a Model

- To describe a market as a network comprised of suppliers and consumers.

# The Model starts from a random graph

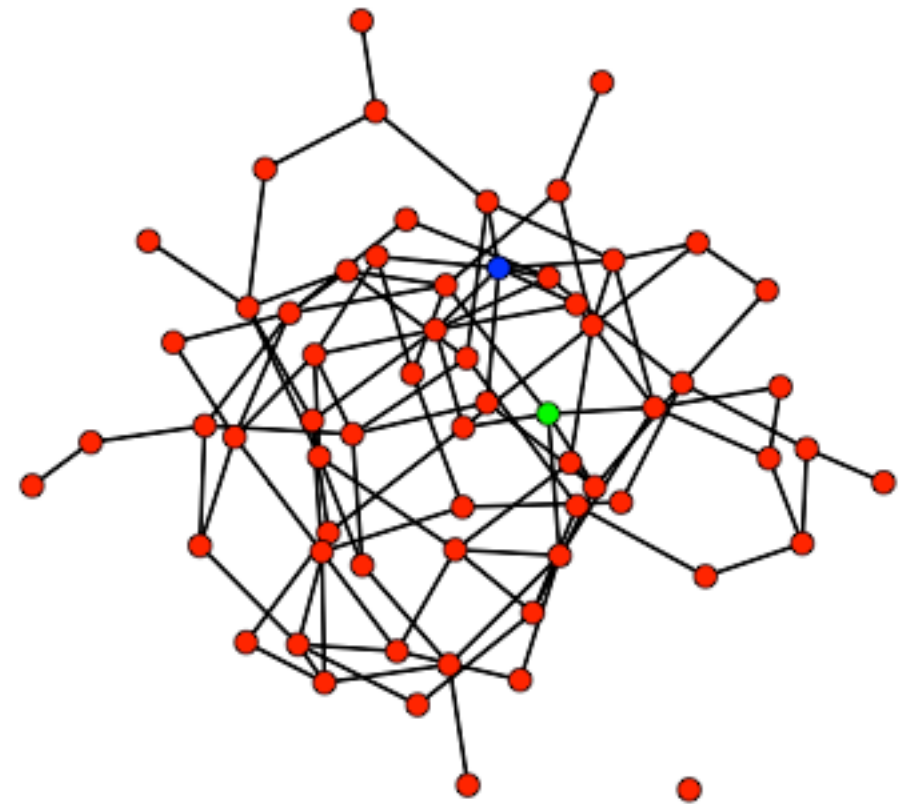
- A random graph comprising of 64 nodes, in which the probability that a tie exists between any pair of nodes is 0.05.





# Two competing suppliers

- $S_f$  (the blue node) is the advantaged supplier (in the Model,  $S_f$  has the maximum eigenvector centrality).
- $S_s$  (the green node) is the disadvantaged supplier (in the Model,  $S_s$  has the 5th maximum eigenvector centrality).
- Other nodes (the red nodes) are consumers.



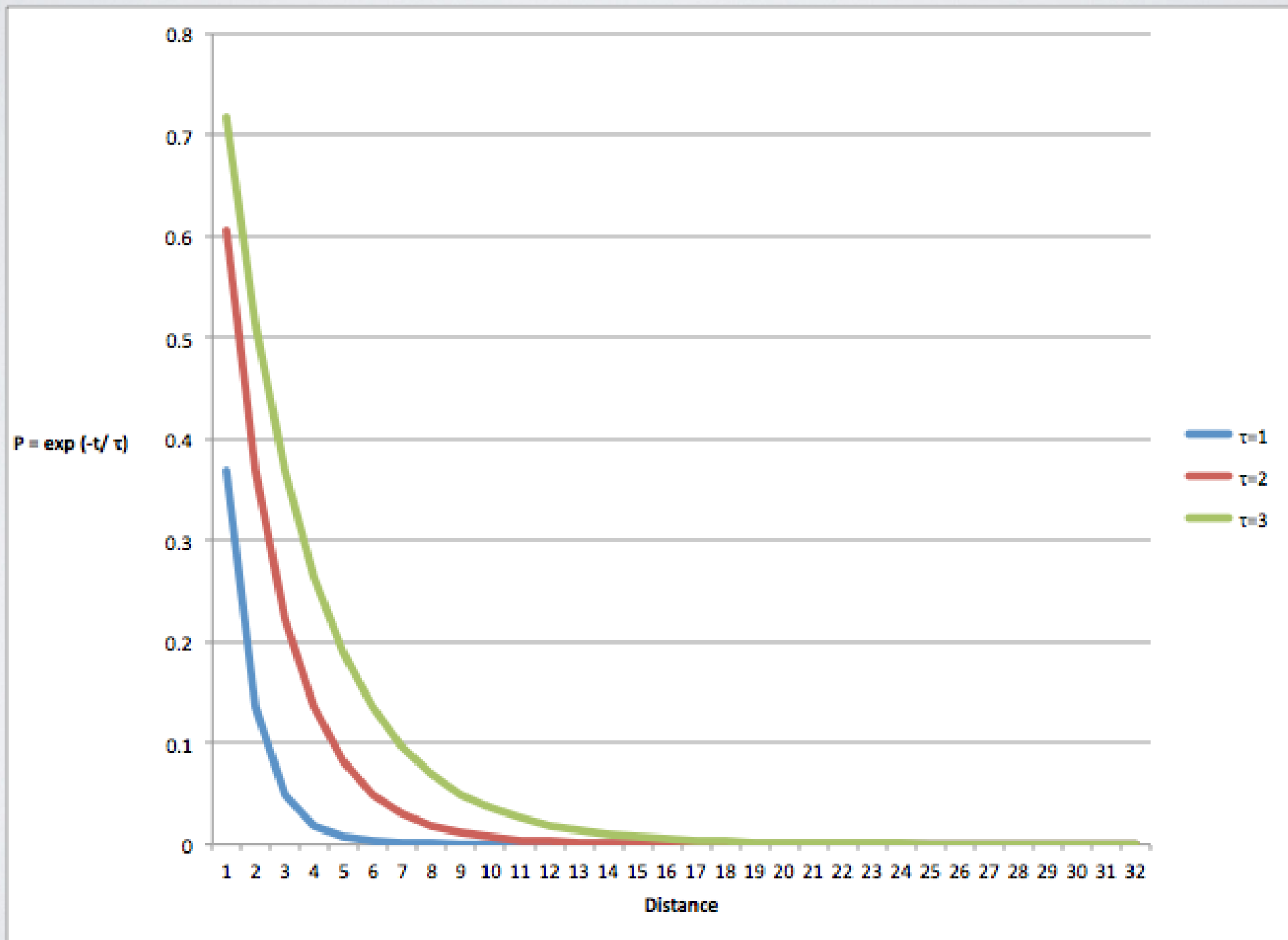
# The sales capabilities of suppliers

$$P = e^{-\frac{t}{\tau}}$$

- The Model denotes the sales capability of a supplier by the probability (P) of the establishment of a tie connecting the node denoting the supplier and another node representing the possible consumer.
- t: the distance between two nodes, one of which denotes the relevant supplier, and the other denotes the relevant possible consumer.
- $\tau$  : a variable prefixed for each of the suppliers that is greater than 0.



The larger  $\tau$  (in the *Model*,  $\tau = 2$ ) represents stronger sales capabilities, and the smaller  $\tau$  (in the *Model*,  $\tau = 1$ ) represents weaker sales capabilities.



## Assumption concerning the behavior of consumers

- Nowadays, consumers often purchase multiple products of the same or a similar kind from multiple suppliers.
- In the *Model*, a variable ( $cCapa$ ) denotes the maximum number of units of products purchased by one consumer, so that the *Model* can represent both a conventional “zero-sum” market ( $cCapa=1$ ), as well as the contemporary market in which (for the purpose of convenience,  $cCapa=64$ ).

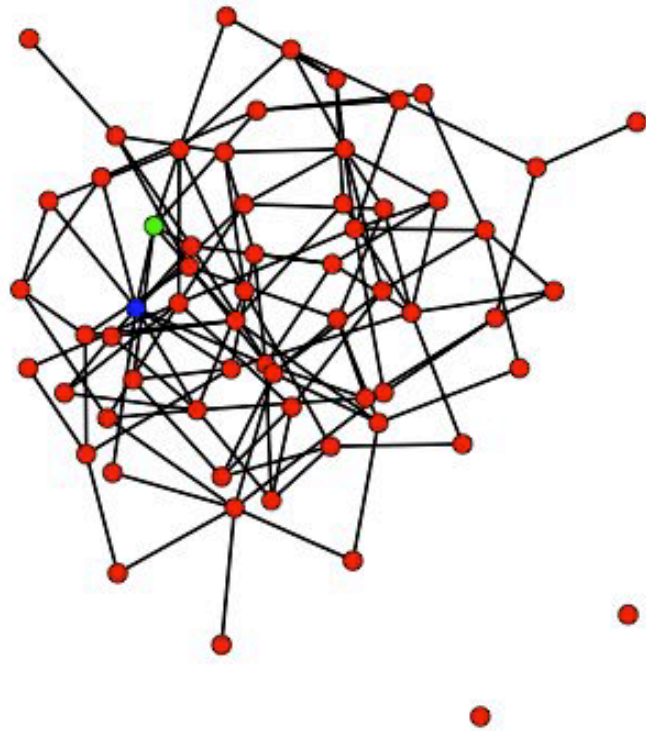


The IPRs owned by suppliers and their degree of strength

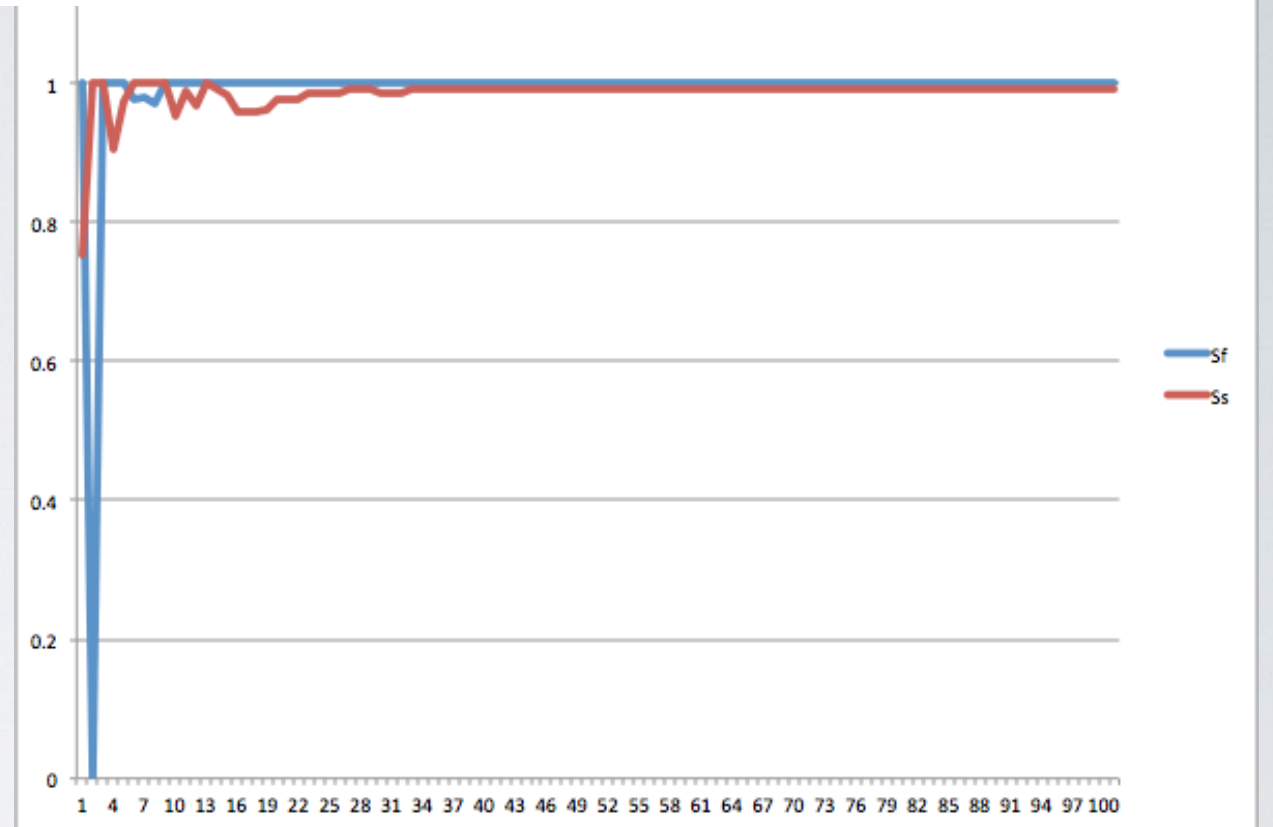
- The *Model* denotes the exercise of IPRs by a supplier by cutting out the edges connecting the other supplier and consumers.
- The strength of the IPRs exercised by a supplier (*fForce* for  $S_f$ , and *sForce* for  $S_s$ ) is denoted by the probability of such cut-out (in the Model, *0* for no exercise of IPRs; *0.2* for the exercise of weaker IPRs; and *0.6* for the exercise of stronger IPRs).

# Example of *Models*

- It should be noted that the same combination of variables does not necessarily produce the same result, because the connections between pairs of nodes and the connections between pairs of nodes that are cut is not fixed.
- It is made only based on given probabilities.
- The results also represent nothing more than examples.

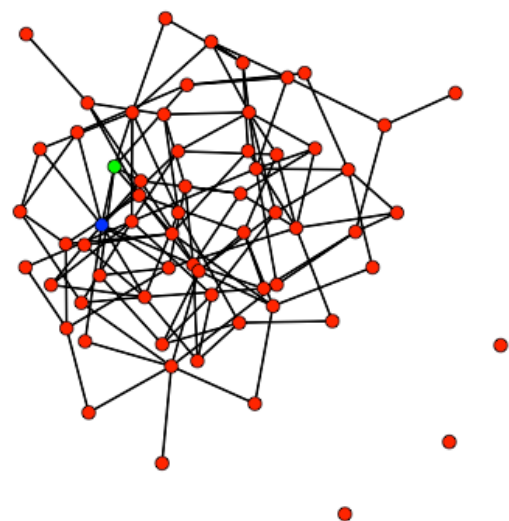


*The eigenvector centralities of  $S_f$  and  $S_s$*

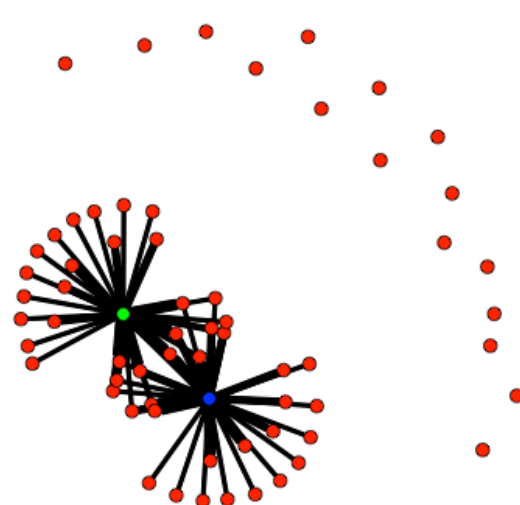


$f\tau$ ( $S_f$ 's sales capability) 1: weaker 2: stronger	$s\tau$ ( $S_s$ 's sales capability) 1: weaker 2: stronger	$fForce$ ( $S_f$ 's IPRs) 0: none 0.2: weaker 0.6: stronger	$sForce$ ( $S_s$ 's IPRs) 0: none 0.2: weaker 0.6: stronger	$cCapa$	Eigenvector centrality after 100th instance
1	1	0	0	64	$evc_f > evc_s$

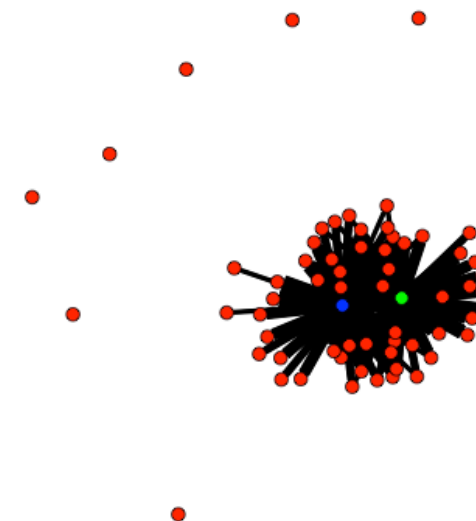




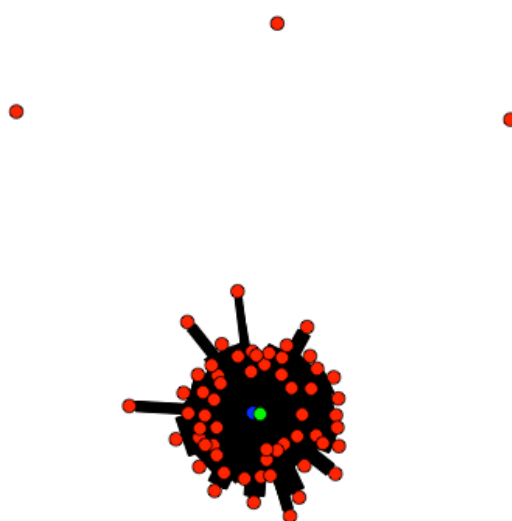
*Default*



*5th Instance*

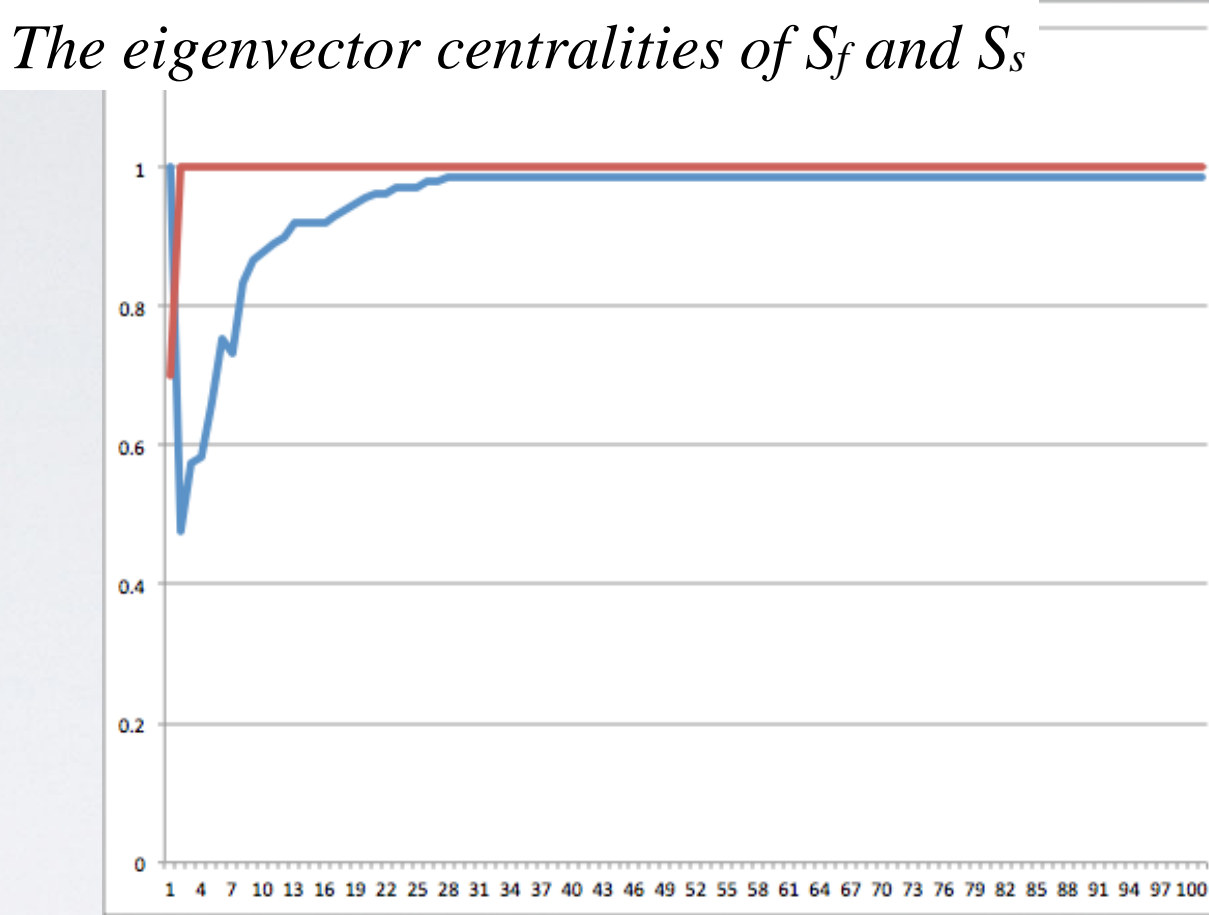
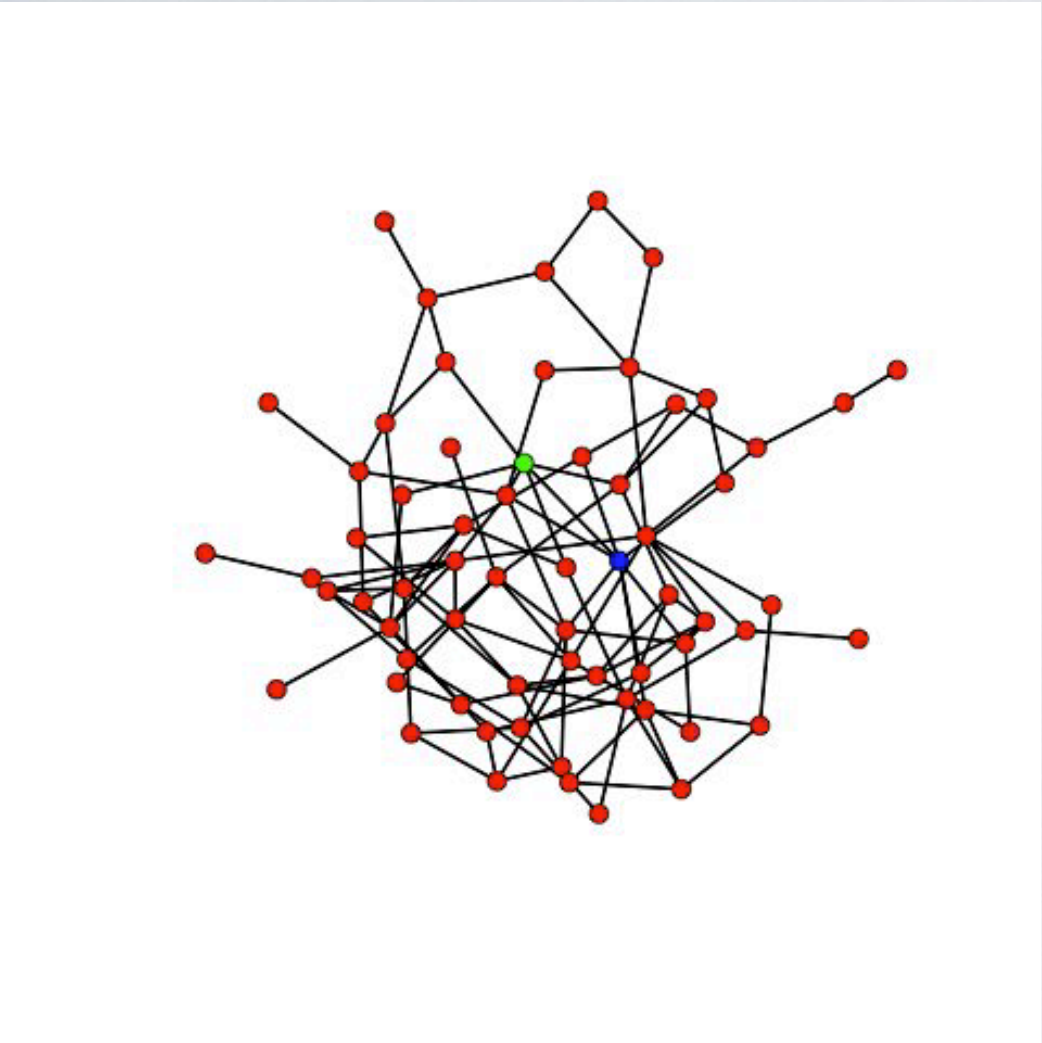


*10th Instance*

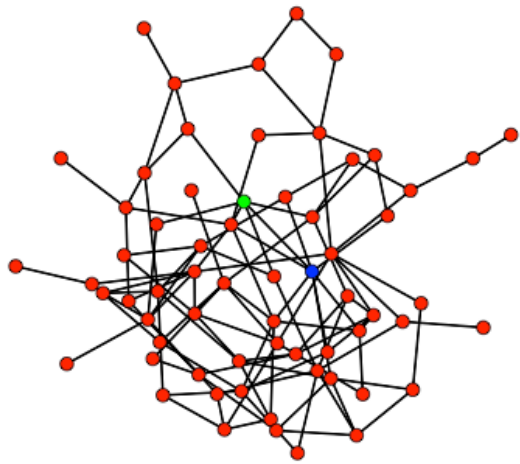


*100th Instance*

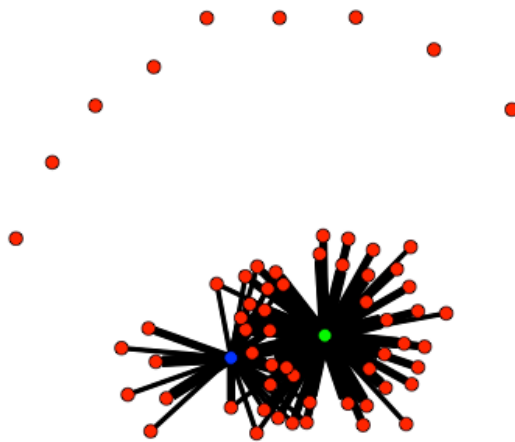
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1	1	0	0	64	$evc_f > evc_s$



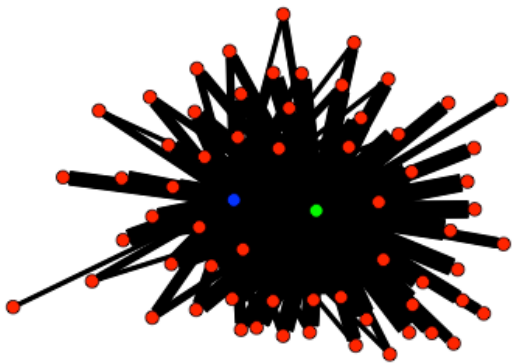
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1	2	0	0	64	$evc_f < evc_s$



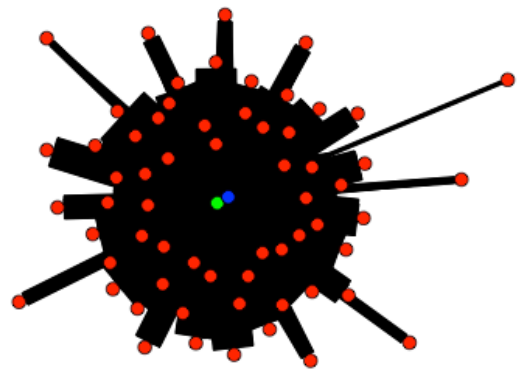
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5th Instance



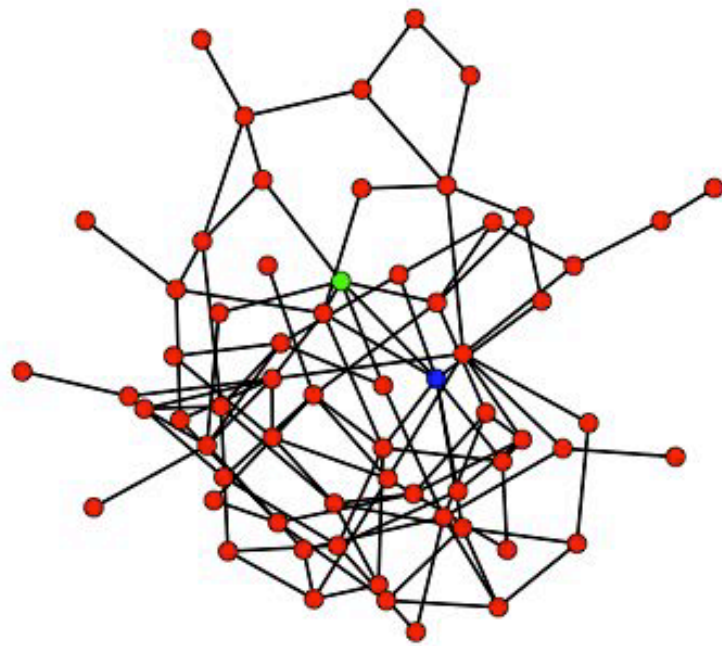
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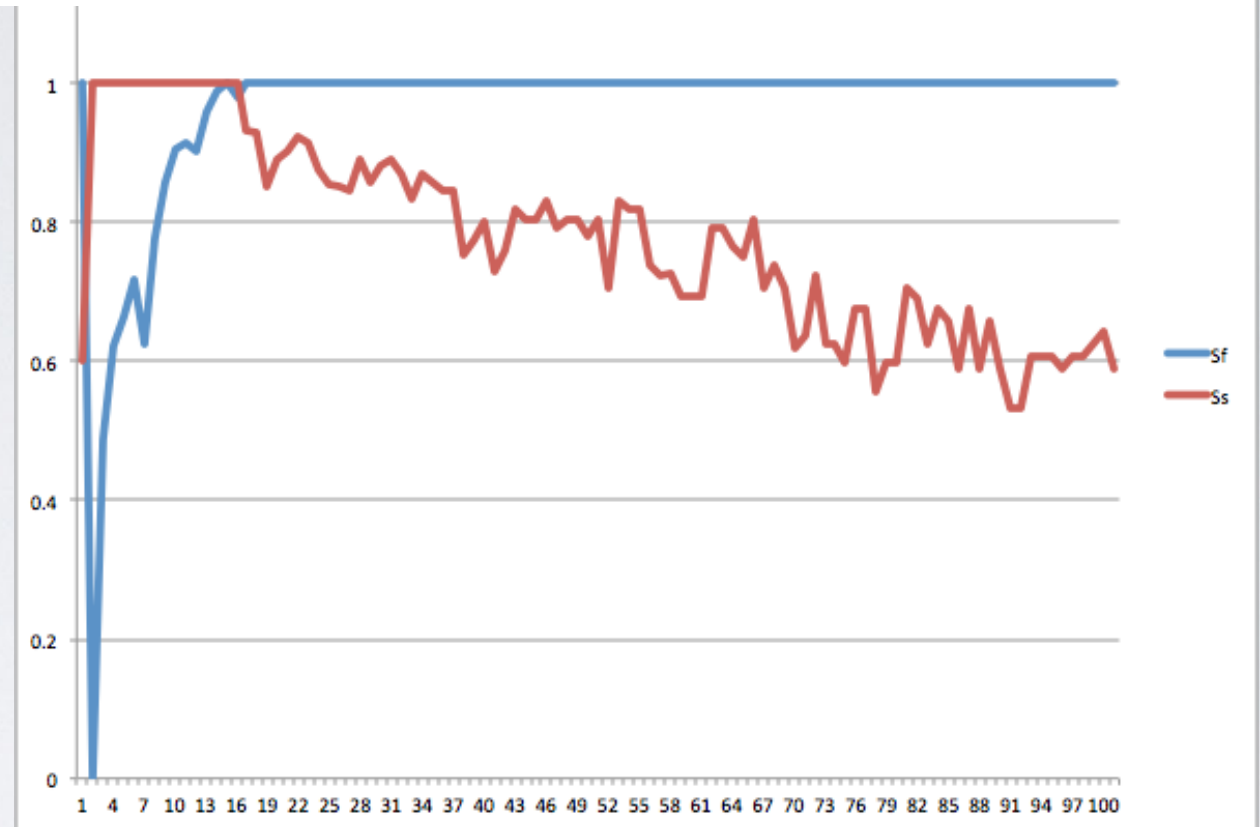
100th Instance

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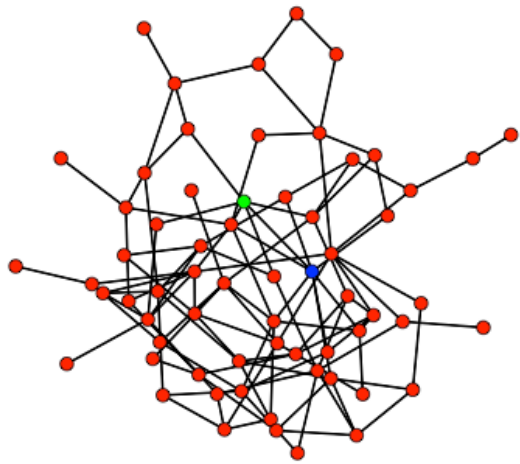




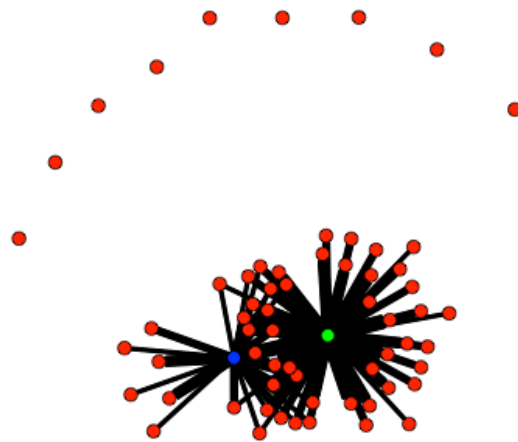
*The eigenvector centralities of  $S_f$  and  $S_s$*



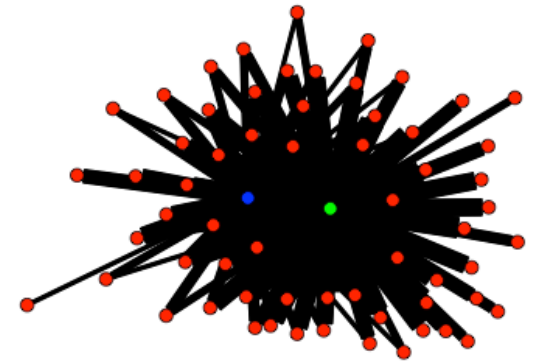
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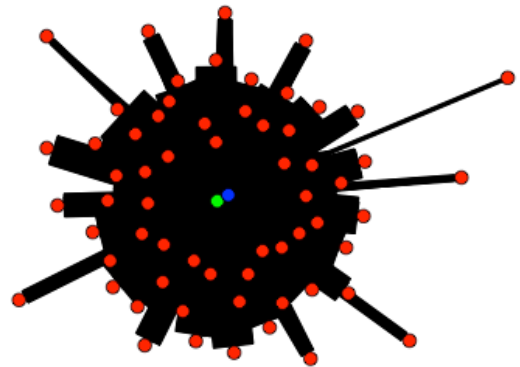
*Default*



*5th Instance*

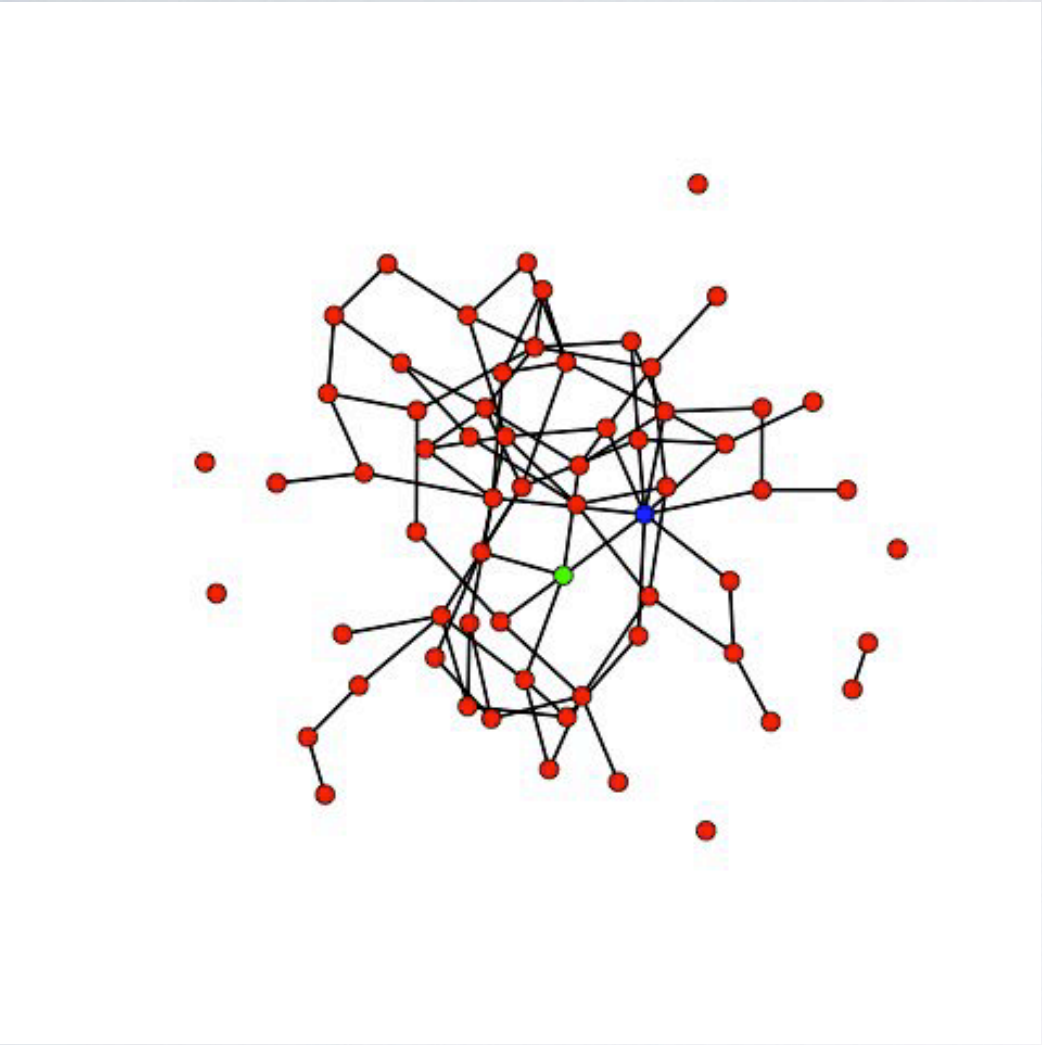


*10th Instance*

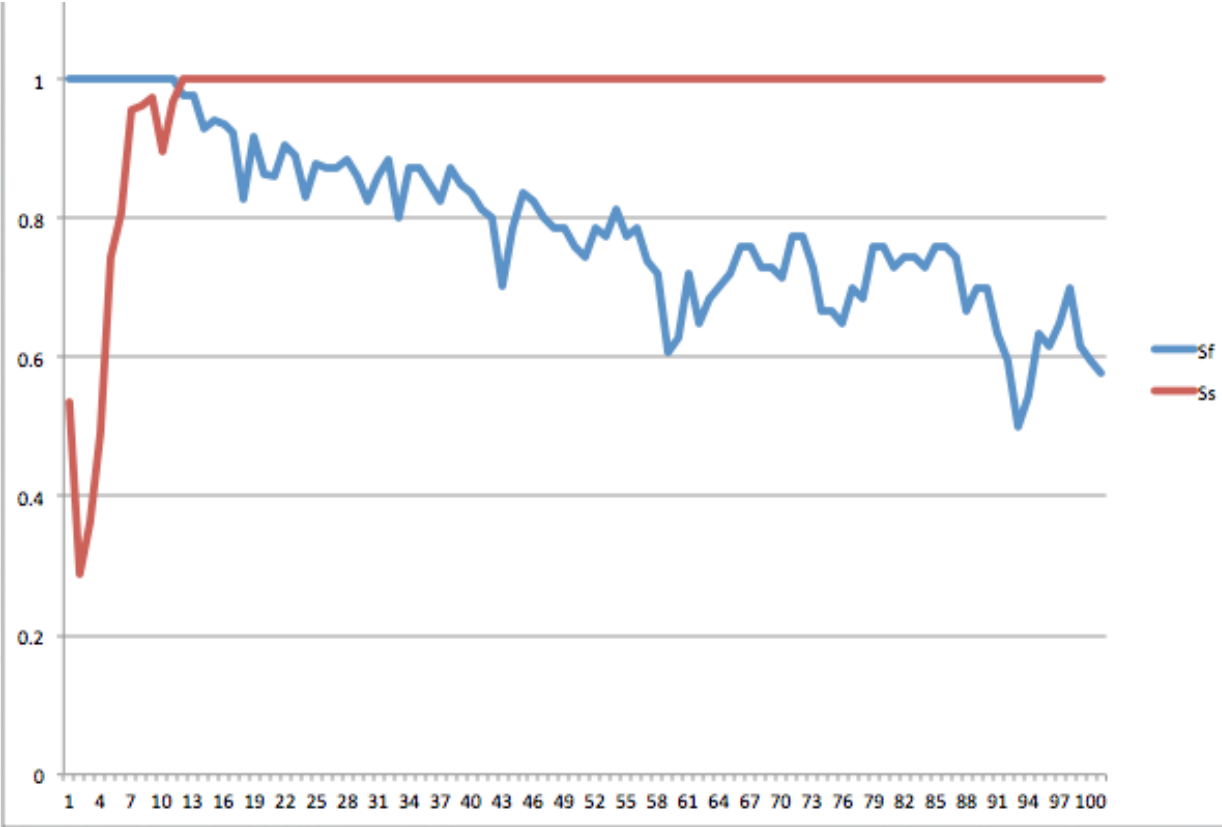


*100th Instance*

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1	2	0.2	0	64	$evc_f > evc_s$

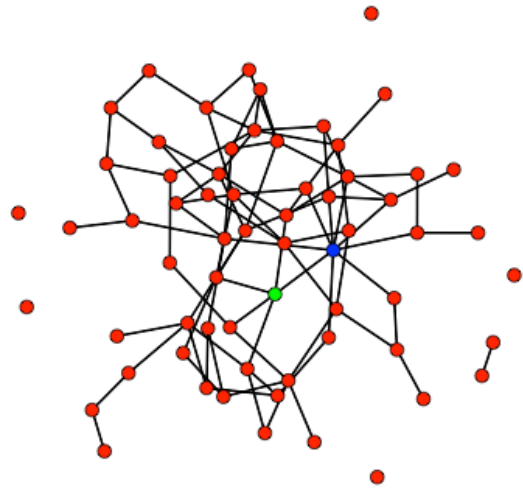


The eigenvector centralities of  $S_f$  and  $S_s$

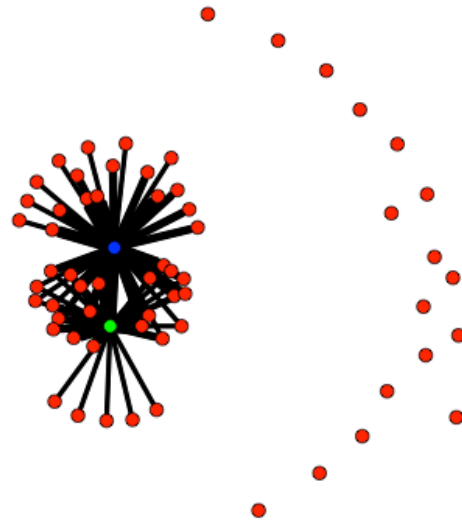


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2	1	0	0.2	64	$evc_f < evc_s$

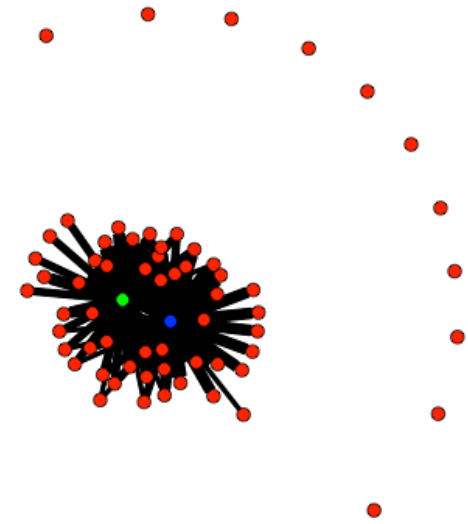




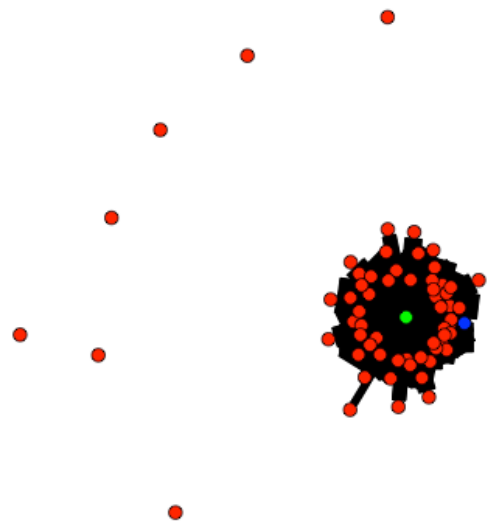
*Default*



*5th Instance*



*10th Instance*



*100th Instance*

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2	1	0	0.2	64	$evc_f < evc_s$

# Suggestions – 1

- There is a certain degree of concern that the IPRs owned and exercised by the foreign businesses would enable them to maintain their comparative advantage, by obstructing the growth of the eigenvector centrality of the domestic businesses.
- The possibility of such IPRs inhibiting market dynamism may lead us to suspect that IPRs are detrimental to the development of domestic businesses in developing countries.

# Suggestions – II

- However, there is a possibility that IPRs, once acquired by the domestic followers, help their eigenvector centrality to overtake the foreign businesses' eigenvector centrality.
- Accordingly, unilateral resistance to stronger IPRs will be harmful to domestic businesses, while adjustments to the degree of protection afforded by IPRs, as a transitory measure to permit domestic businesses to catch up, could offer a practical solution.





Thank you.