

How open are innovations among user-innovative South African firms?: A Case Study

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Introduction

- **Innovation** - important factor in the competitiveness of not only firms but also countries
- **Competitiveness** - has become both global and intense, and this has led to the decrease of product cycles
- Products developed are quickly replaced by newer or improved products increasing the need for product development and reducing product development timelines
- Knowledge has become multidisciplinary and more broadly located.
- This has led to a move toward partnering, exchange of complementary expertise, to have access to different technologies that allow for the rapid turnover of new products into the market.

Closed vs. Open

- **Closed innovation** - a company is engaged in innovation internally, using their own R&D departments to develop new products and processes
- Those products or processes developed outside the strategic focus of the company would be set aside remaining unused within the company
- **open innovation** system - innovators collaborate with 'outside players' where companies innovate in collaboration with clients, other companies, universities, research institutes and public departments.

- This leads to an exchange of expertise and technologies allowing for a quicker development of products and processes
- Additionally, unused spin-out technologies and intellectual property(IP) can be picked up by collaborators whose strategic focus is in line with those products or processes and hence benefit them, as well as the company providing the IP.

Objectives

- The paper aims to establish the extent to which innovations are open among the process and/or product innovative enterprises that completed the South African Innovation survey questionnaire
- Therefore, the data analysis involved cross-tabulations and the associated Chi-squared tests of the relevant variables for these enterprises

Methodology

- The study is based on data from the South African National Innovation Survey 2008
- The paper adopts a case-study approach in the sense that the results are not intended to represent the entire population of business enterprises in South Africa, but only those (n= 757) that responded to the survey
- The survey questions on which these variables were based were:

- 1) the follow-up question for each of process and product innovative enterprises that seeks to establish who developed/owned the innovation,
- 2) the question that seeks to establish which partners and in which geographic locations the enterprise cooperated with, and
- 3) the question that seeks to establish how important to the enterprise's innovation activities each of the various information sources were to the enterprise

- The first of the questions on which the ‘innovation developer/owner’ variable was based, has the following three options from which an enterprise could only select one:
 - a) mainly own enterprise or enterprise group; henceforth referred to as ‘user’-innovative,
 - b) own enterprise together with other enterprises or institutions; hereafter referred to as ‘together with’-innovative, and
 - c) mainly other enterprises or institutions, referred to as ‘other enterprises’- innovative.

- The second question gave rise to two types of variables as follows:
 - a) type of cooperation / collaborative partner, referred to as 'partner type' and
 - b) collaborative partner variety, referred to as 'partner variety'.
- For the purpose of this paper, the geographic location of the cooperation partner was muted in defining the 'partner type' variable.
- This was done by coding the variable 1 if the enterprise cooperated with a given 'partner type' and 0 otherwise, regardless of the geographic location of the partner or partners

- Since each enterprise could have more than one partner, such a 'partner type' variable was constructed for each available type of cooperation partner
- The 'partner variety' variable was then constructed by counting the number of partners an enterprise cooperated with
- Inherent in the 'partner variety' variable is the concept that the higher the number of cooperation partners, the higher the enterprise's degree of openness to its partners regarding its innovations

- In the third question, an enterprise could rank the importance of each information source as 'high' or 'medium' or 'low' or 'not used' and hence each 'information source' served as a variable

- Having defined the variables, the following types of cross-tabulations were performed:
 - 1) 'innovation owner/developer' by 'partner variety',
 - 2) 'innovation owner/developer' by each 'partner type', and
 - 3) 'innovation owner/developer' by each 'information source'.
- The first type of cross-tabulations aimed to establish whether or not the degree of openness regarding innovations is dependent upon who owned the innovation where the 'ownership' could be 'user'- or 'together with'- or 'other enterprises'- innovators

- The purpose of the second type cross-tabulations was to identify the types of partners for which either ‘user’-, ‘together with’- or ‘other enterprises’- innovators or a combination of two of levels of ‘ownership’ had a higher propensity to cooperate with compared to the other level(s) of ‘ownership’ of the innovations
- Similarly, the third type of cross-tabulations was to identify the ‘information sources’ that enterprises in each of the levels of ‘ownership’ of the innovations were more inclined to use

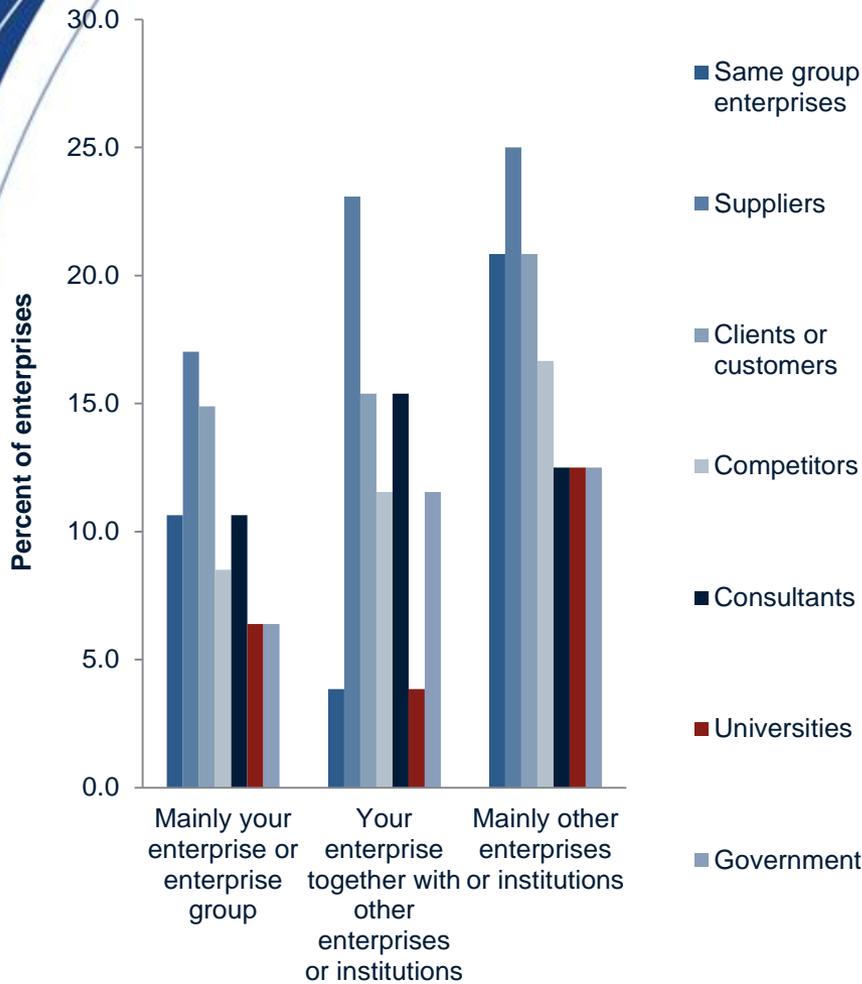
- For comparison purposes, the cross-tabulations were performed for each of the following types of enterprises:
 - 1) process innovative (including those that had carried out both process and product innovation activities),
 - 2) process only innovative (excluding those that had carried out both process and product innovation activities),
 - 3) product innovative (including those that had carried out both product and process innovation activities), and 4) product only innovative (excluding those that had carried out both product and process innovation activities).

Results

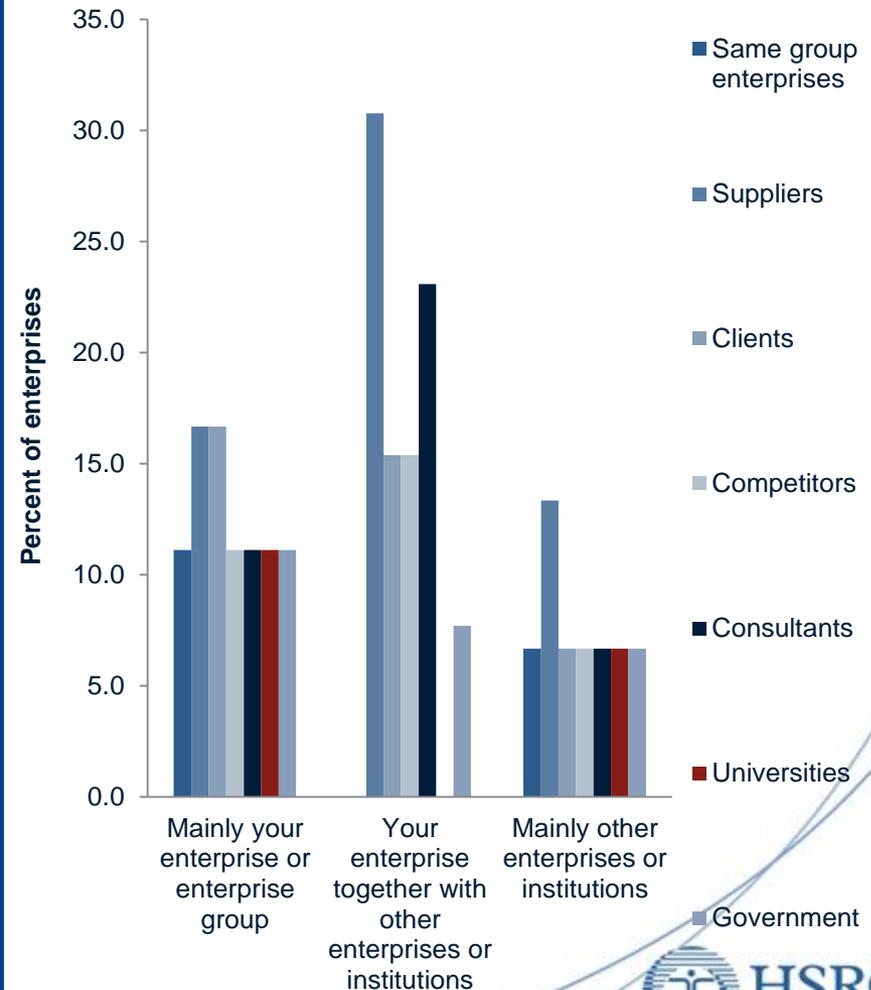
		Process innovators (Chi-square = invalid)					Process only innovators (Chi-square = 7.627, P = 0.267)				
	Partner variety	0	1 to 2	3 to 4	5 to 6	Total	0	1 to 2	3 to 4	5 to 6	Total
Innovation	Mainly own						15 (83.3)	0 (0.0)	1 (5.6)	2 (11.1)	18 (100)
	Enterprise/ group	39 (83.0)	2 (4.3)	3 (6.4)	3 (6.4)	47 (100)					
developer	Enterprise together with others	19 (73.1)	3 (11.5)	3 (11.5)	1 (3.8)	26 (100)	9 (69.2)	1 (7.7)	3 (23.1)	0 (0.0)	13 (100)
	Mainly other enterprises	18 (75.0)	2 (8.3)	1 (4.2)	3 (12.5)	24 (100)	13 (86.7)	1 (6.7)	0 (0.0)	1 (6.7)	15 (100)
	Total	76 (78.4)	7 (7.2)	7 (7.2)	7 (7.2)	97 (100)	37 (80.4)	2 (4.3)	4 (8.7)	3 (6.5)	46 (100)

Distribution of process innovative enterprises by innovation ownership and type of collaboration partner

Process innovators

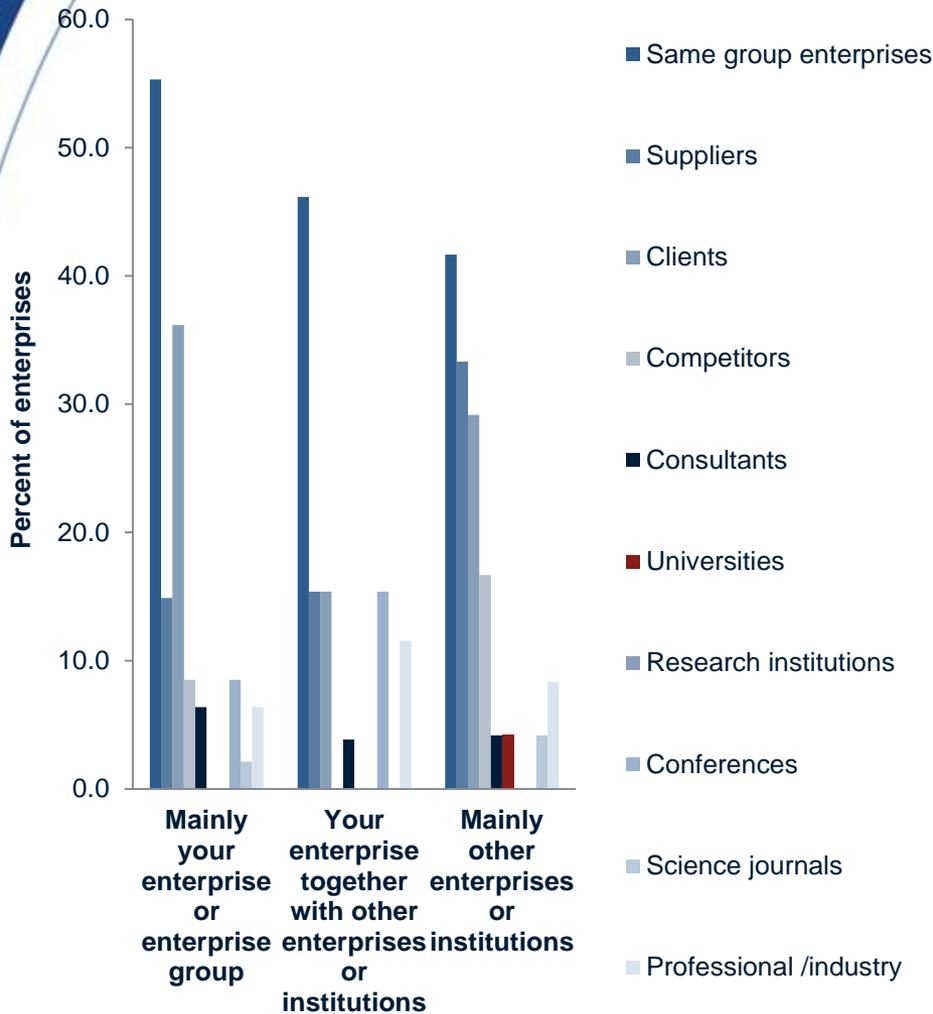


Process only innovators

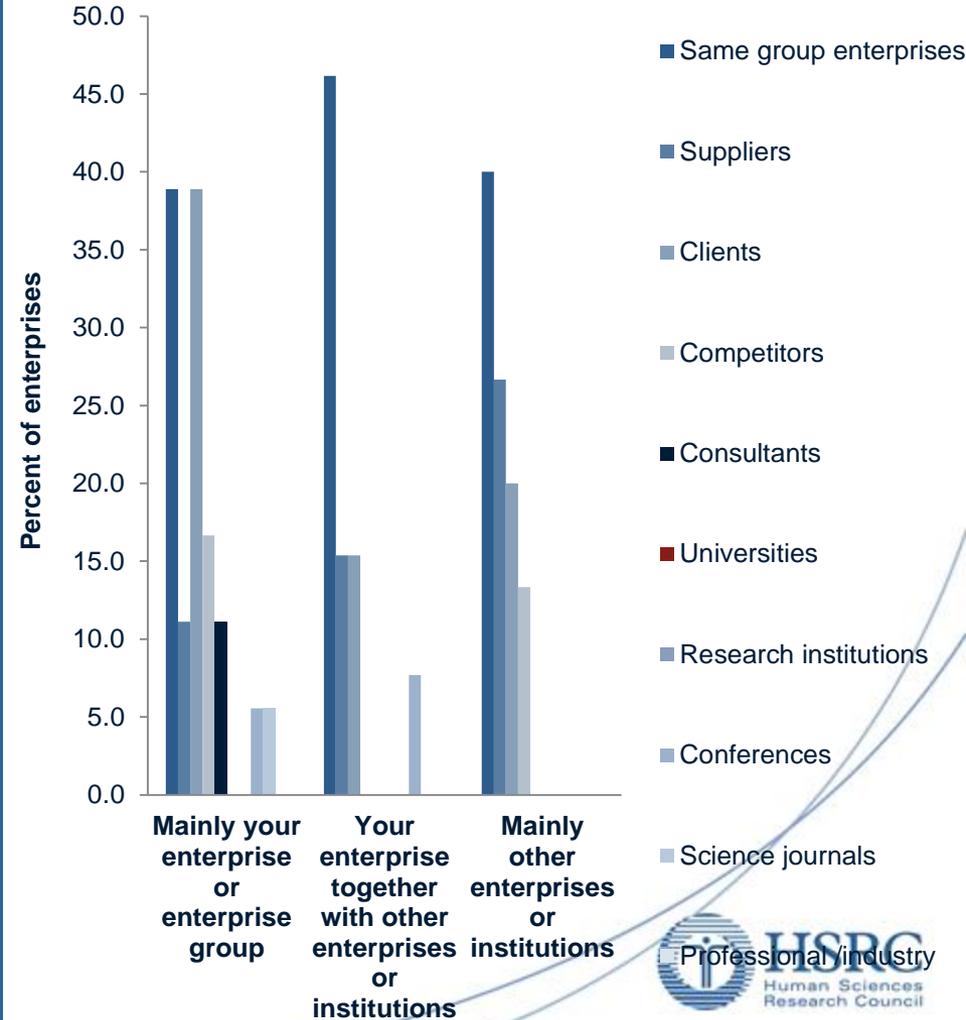


Distribution of process innovative enterprises by innovation ownership and sources of information with a high level of importance

Process innovators



Process only innovators

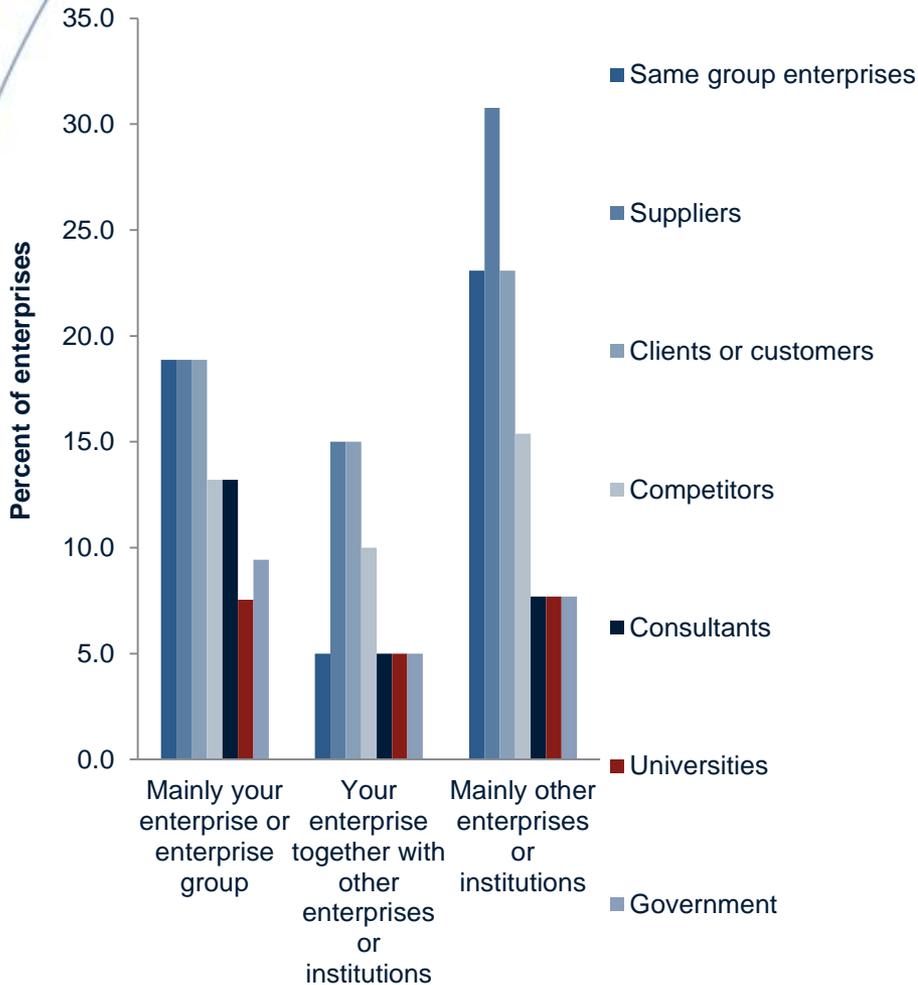


Distribution of product innovative enterprises by innovation ownership and collaboration partner variety [Number (Percent) of enterprises]

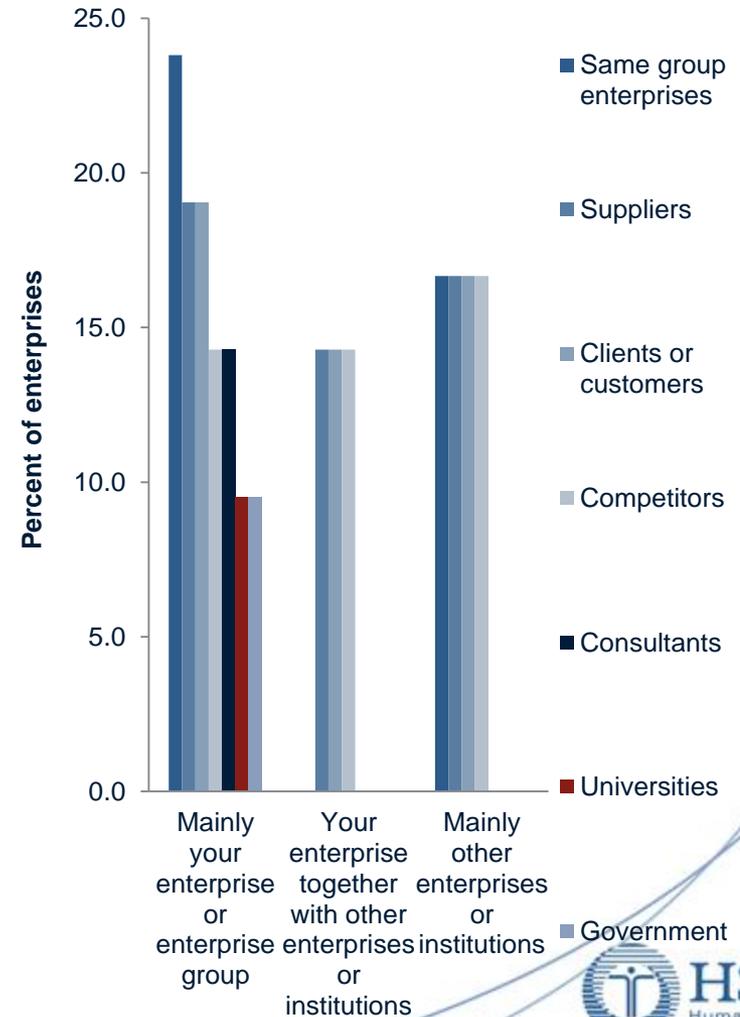
Partner variety	Product innovators (Chi-square = invalid)					Product only innovators (Chi-square = invalid)				
	0	1 to 2	3 to 4	5 to 6	Total	0	1 to 2	3 to 4	5 to 6	Total
Innovation developer Mainly own Enterprise/ Group	41 (77.4)	4 (7.5)	4 (7.5)	4 (7.5)	53 (100)	16 (76.2)	2 (9.5)	1 (4.8)	2 (9.5)	21 (100)
Enterprise together with others	17 (85.0)	1 (5.0)	1 (5.0)	1 (5.0)	20 (100)	6 (85.7)	0 (0.0)	1 (14.3)	0 (0.0)	7 (100)
Mainly other enterprises	9 (69.2)	2 (15.4)	1 (7.7)	1 (7.7)	13 (100)	5 (83.3)	0 (0.0)	1 (16.7)	0 (0.0)	6 (100)
Total	67 (77.9)	7 (8.1)	6 (7.0)	6 (7.0)	86 (100)	27 (79.4)	2 (5.9)	3 (8.8)	2 (5.9)	34 (100)

Distribution of product innovative enterprises by innovation ownership and type of collaboration partner

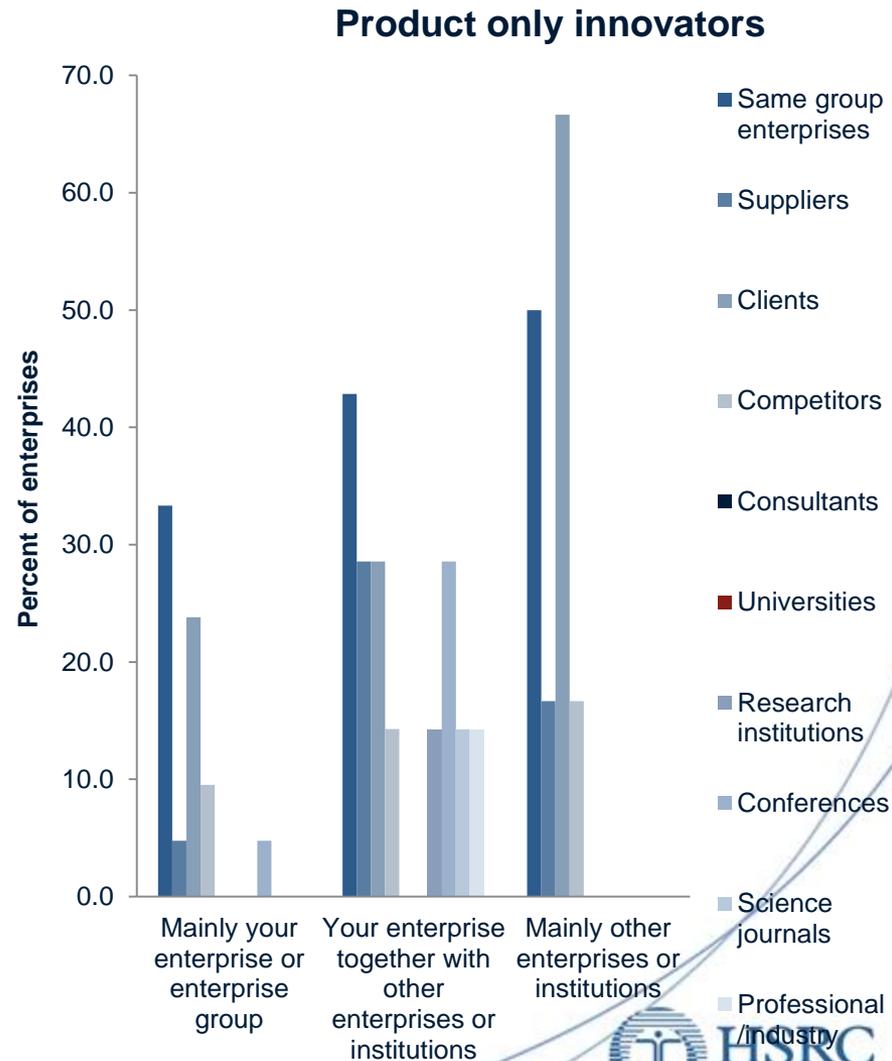
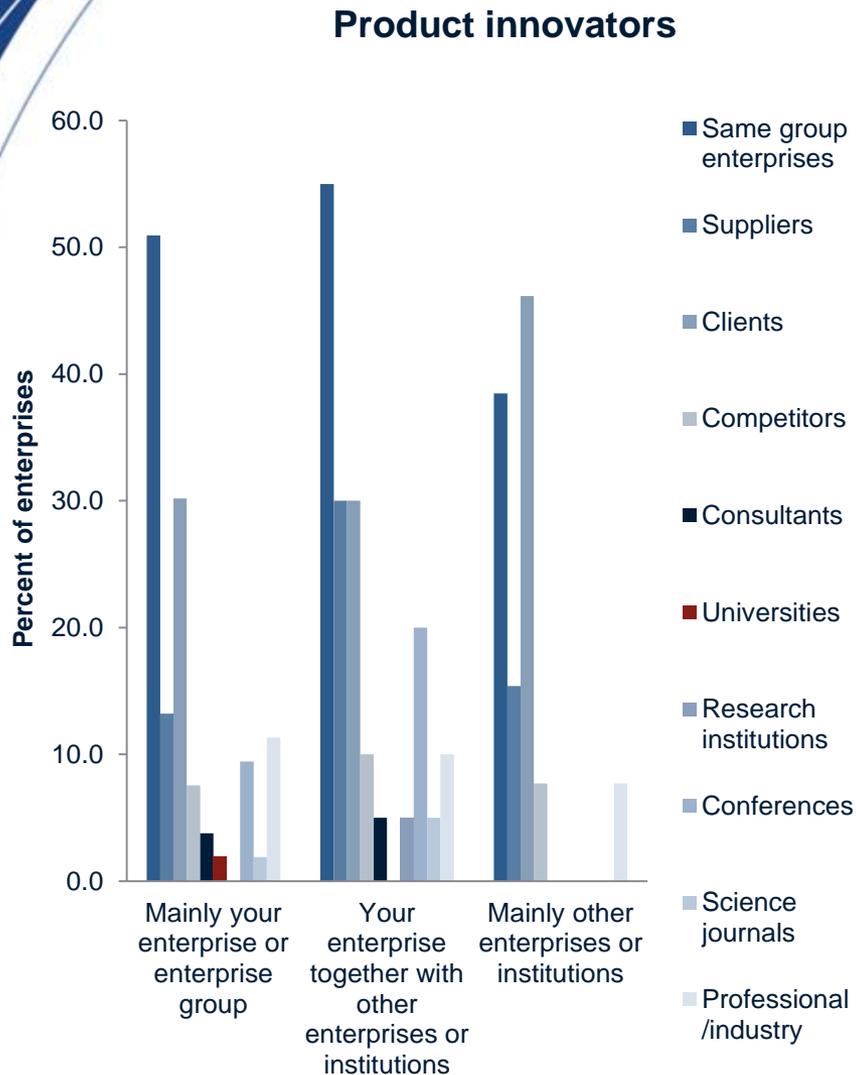
Product innovators



Product only innovators



Distribution of product innovative enterprises by innovation ownership and sources of information with a high level of importance



Discussion

- Findings of this study focused on determining if innovation ownership influences firms' innovation openness, partner variety and firms' sources of information
- These questions were answered for process innovators, process only innovators, product innovators as well as product only innovators.

- Evidence presented in the paper show that for process innovation South African firms' disposition to open innovation is not influenced by innovation ownership as 'user' innovators are equally likely to be open to outside innovation as 'together with' and 'other enterprises' innovators
- Differences are however noticed when it comes to collaboration; 'together with' innovators show a tendency collaborate with a more variegated range of partners when compared to 'user' and 'other enterprises' innovators.

- Findings from this study further show that for successful process innovative enterprises, 'same group' was the main source of information for all innovation ownership types
- Clients were also a major source of information for 'user' and 'other enterprises' innovators
- Suppliers and competitors were major sources of information for 'together with' and 'other enterprises' innovators

Inbound and outbound openness for process and process only innovators are summarised in the table below for the different innovation ownership schemes.

		Process innovators		Process only innovators	
		In-bound open with	Out-bound open with	In-bound open with	Out-bound open with
Innovation ownership	User innovator	Same group, clients	Suppliers, competitors, consultants, universities	Same group, clients or customers, competitors	Suppliers
	Together with innovators	Same group, suppliers, clients or customers	Consultants, universities	Same group	Suppliers, competitors consultants, universities
	Other enterprises innovators	Same group	Suppliers, clients or customers, competitors, consultants, universities	Same group, Suppliers, clients, competitors	Consultants, universities

- For product innovators, innovation ownership affects collaboration; ‘user’ and ‘other enterprises’ innovators tend to collaborate more with external partners than ‘together with’ innovators
- Regarding sources of information, same group, suppliers and clients were shown to be important sources of information for all innovation types
- Conferences were also important sources of information for ‘together with’ collaborators than for ‘user’ and ‘other enterprises’ innovators
- As for products only innovators, ‘user’ innovators collaborate with more variegated collaborators than ‘other enterprises’ and ‘together with’ innovators.

Inbound and outbound openness for process and process only innovators are summarised in the table below for the different innovation ownership schemes.

		Product innovators		Product only innovators	
		In-bound open with	Out-bound open with	In-bound open with	Out-bound open with
Innovation ownership	User innovator	Same group, Clients or customers	Suppliers, competitors, universities	Same group, clients or customers	Suppliers, competitors, consultants, universities
	Together with innovators	Same group, suppliers, clients or customers	Universities	Same group, suppliers, clients or customers, competitors	
	Other enterprises innovators	Same group, clients or customers	Suppliers, competitors, consultants and universities	Same group, clients or customers	Suppliers, competitors

THANK YOU