

Academic Entrepreneurship in a Resource Constrained Environment: Diversification and Synergistic Effects

By

de Silva, L. Ranmuthumalie

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Outline

- Introduction –Academic Entrepreneurship and Resource constrained environment
- Theoretical Context- Hypotheses
- Research Design
- Findings, Policy Implications and Future Research Avenues

Definition – Academic Entrepreneurship

Focused Definition -Academic Entrepreneurship

- Academic engagement in the formation of spin-off companies to commercialise Intellectual Property (Radosevich 1995, Samson and Gurdon 1993, Daniels and Hofer 1993)

Broad Definition - Academic Entrepreneurship

- Academic engagement in a wide array of knowledge transfer activities (Jones-Evans and Klofsten 2000; D'Este and Perkmann 2011)

Broader Definition > Focused Definition

Academic entrepreneurship is defined as academics capitalising on perceived opportunities through matching these with resources as a means of accumulating wealth which could be monetary and/or social

Resource constrained environment

- Most of the research on academic entrepreneurship has been carried out in a developed country context
- Developing, Low income countries?

High Resource Scarcities

- Human (Alexander and Andenas 2008, Griffith-Jones et al. 2003),
- Financial (United Nations Human Settlements Programme 2005),
- Infrastructural, technological (World Bank 2010),
- Institutional (Claude and Weston 2006)

What is the nature of academic entrepreneurial engagement in a resource constrained environment?

Theoretical Context: Hypotheses

- **Internal Resources**

1. Resource Based View -

↑ Resource status of the university ↑ tendency for A.E (Eun 2006)

2. General entrepreneurship –

Ownership to resources is not mandatory. Entrepreneurs creatively overcome resource constraints (Hart et al 1995)

- **External Resources**

1. ↑ Macro environment, which mainly comprises industry and government (O'Shea et al 2004; Etzkowitz and Leydesdorff 2000; Siegel et al 2004)

↑ tendency for A.E

2. General entrepreneurship – extremely unpromising and constrained environment a higher level of entrepreneurial behaviour could be observed (Kodithuwakku and Rosa 2002)

- **Resource-rich environment**

Resources are a means to be entrepreneurial

- **Resource constrained environment (R.C.E)**

R.C.E may inhibit Academic Entrepreneurship

Being entrepreneurial is a means to be resource-rich in a R.C.E.

H 1: Being entrepreneurial is a means to be resource-rich in a R.C.E

Academic entrepreneurs tend to carry out a combination of different academic entrepreneurial activities (Tijssen 2006)



The Types of Academic Entrepreneurial Activities

Teaching Related	Research Related	Company Creation
<ol style="list-style-type: none"> 1. External teaching 2. Development of new degree programmes 3. Placing students as trainees in the industry 4. Conducting training and seminar sessions to industry 	<ol style="list-style-type: none"> (1) Working in the industry (research based) (2) Research based consultancy for industry through the university (3) Research based consultancy privately (but without forming a company) (4) Developing products or services with potential for commercialization. (5) Acquiring research funding from government, non-governmental or international bodies (those without collaborations with industry) (6) Collaborating with industry through joint research projects (7) Research related assistance to small business owners. 	<ol style="list-style-type: none"> (1) Contributing to the formation of joint ventures in which university and industry are the joint partners (2) The formation of joint venture/(s) privately through collaborating with industry (3) Contributing to the formation of one or more new spin-off companies (4) Contributing to the establishment of university incubators and/or science parks (5) Contributing to the formation of university centres designed to carry out commercialization activities (6) The formation of your own company/(s)

The Types of Diversification Strategies

Diversification Strategies	Teaching Related	Research Related	Company Creation	Type of diversification
Type 1	√			Related diversification
Type 2		√		
Type 3			√	Unrelated diversification
Type 4	√	√		
Type 5	√		√	
Type 6		√	√	
Type 7	√	√	√	

- Related diversification → More opportunities to share common resources (Markides and Williamson 1996)
- Unrelated diversification → Due to limited opportunities and resources, academics may engage in diverse academic entrepreneurial activities

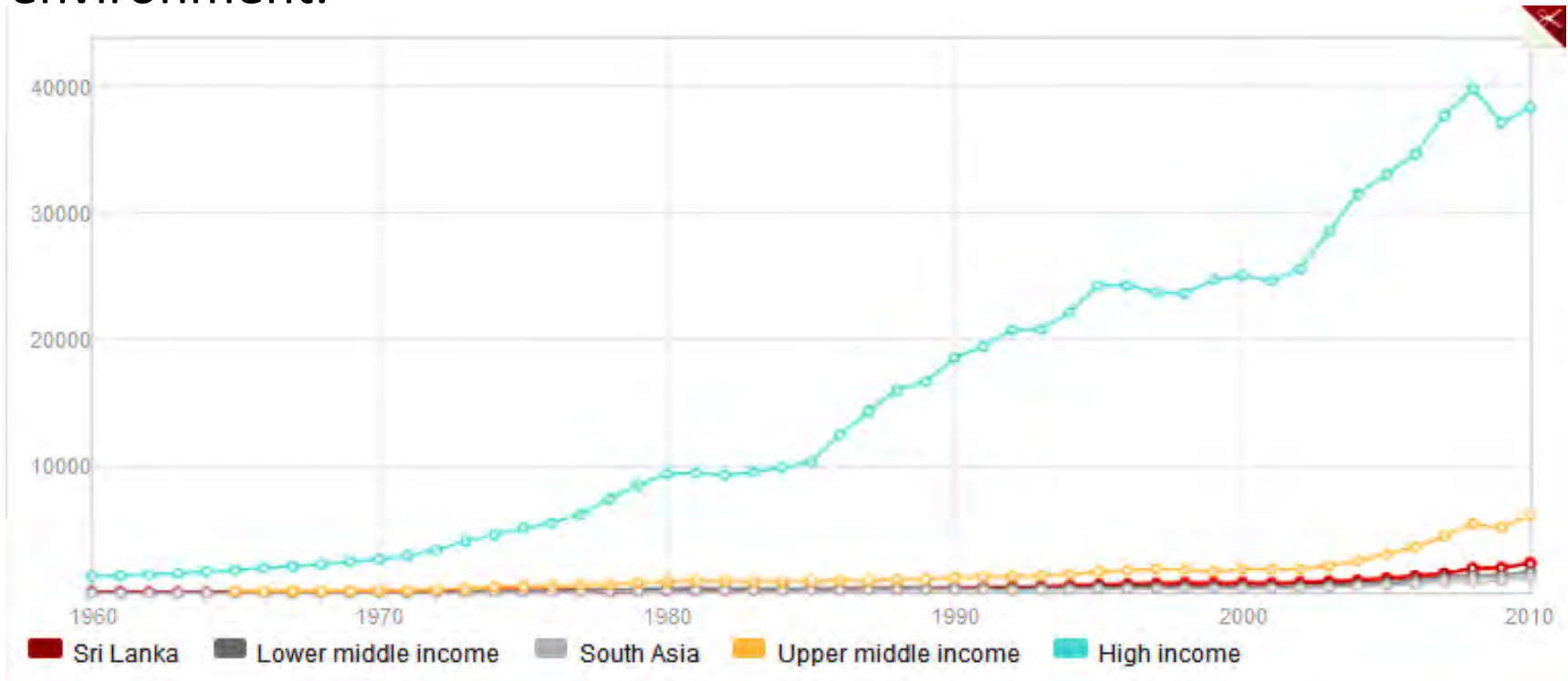
H 2: Academic entrepreneurs in a R.C.E are more likely to engage in unrelated diversification than related diversification

- Diversification → Synergistic effects (social network, physical resources, knowledge and skills, input-output flow)
- Related diversification → Share capabilities and resources (Markides and Williamson 1996) ↑ synergistic effects
- Unrelated diversification → Resource competitions, limited opportunities to diversify into related activities extensively, company creation more resources ↑ synergistic effects

H3: In a R.C.E, unrelated diversification by academic entrepreneurs generates more synergistic effects than related diversification

Research Design

Study Context – Sri Lanka to represent a resource constrained environment.



GDP per capita (current US\$) income

Data Collection – Mixed Methods - Three Phases

1.Initial Data Gathering Stage - telephone discussions were conducted with registrars of 8 universities

2.On-line Survey –

Sampling Strategy – Cluster sampling - Selection of academics in 6 out of 13 universities in Sri Lanka based on the age, location and size of universities

Piloted with 16 academics

A rate of response of 30% was achieved (358 responses).

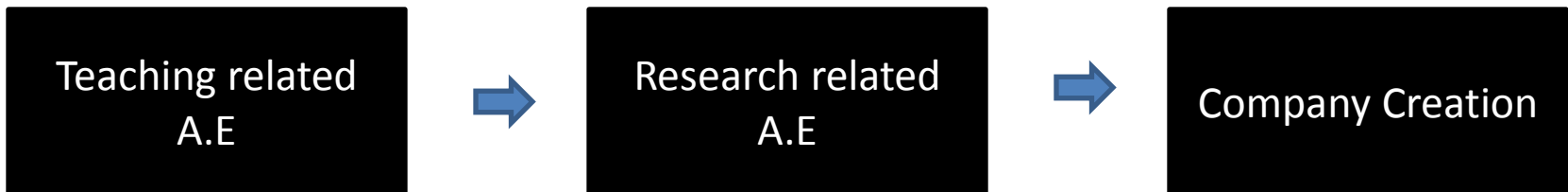
3. In-depth Interviews - A sample (78 respondents) of those who responded to the on-line survey was selected based on the typologies of academic entrepreneurs.

Purpose – Investigate what made them engage in academic entrepreneurial activities

Findings

	Frequency
Academic Entrepreneurs	315
Non- engagement	43

H 1: *Being entrepreneurial is a means to be resource-rich in a resource constrained environment*
Accepted



Findings

Diversification Strategies

Typologies of Academic Entrepreneurs	Teaching Related (4)	Research Related (8)	Company Creation (6)	Frequency
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H 2: Academic entrepreneurs in a resource constrained environment are more likely to engage in unrelated diversification than related diversification

Accepted

Type 6		√	√	4
Type 7 – Triple Role	√	√	√	122
Non- engagement				43

The Extent of Engagement

Teaching related Academic Entrepreneurial Activities

Chi-square test -significant difference among three types of academic entrepreneurs with respect to the extent of engagement in teaching related academic entrepreneurial activities $X^2 (6, N=302) = 48.350, p = 0.000$

	One Activity	Two Activities	Three Activities	Four Activities
Single role Academic Entrepreneurs	43.3%	23.3%	30%	3.3%
Double role Academic Entrepreneurs	14.7%	29.3%	28.7%	27.3%
Triple role Academic Entrepreneurs	4.1%	16.4%	36.1%	43.4%

Teaching related Academic Entrepreneurial Activities

	Single role A.E.	Double role A.E.	Triple role A.E.
External teaching	60%	64.7%	73.8%
Introducing new degree programmes	53.3%	73.3%	71.3%
Finding industrial placements for students	46.7%	68%	90.2%
Training and seminars for industry	33.3%	62.7%	83.6%

Research related Academic Entrepreneurial Activities

Chi-square test - significant difference between two types of entrepreneurs $X^2(7, N=272) = 56.404, p = 0.000$.

Type of entrepreneur	Number of activities							
	1	2	3	4	5	6	7	8
Double role Academic Entrepreneurs	17.3%	22.7%	16%	17.3%	13.3%	12%	0.7%	0.7%
Triple role Academic Entrepreneurs	3.3%	7.4%	13.1%	13.9%	19.7%	18.9%	15.6%	8.2%

Research related Academic Entrepreneurial Activities

	Double role A.E.	Triple role A.E.
Informal exchange of knowledge with industry	60.7%	81.1%
Working in the industry on secondments	24%	55.7%
Research based consultancy for industry through the university	51.3%	77%
Research based consultancy privately	34%	54.9%
Developing products with the potential for securing patents	16.7%	37.7%
Acquiring funding from government, non-governmental or international bodies (those without collaborations with industry)	54%	63.1%
Collaborating with industry through joint research projects	70%	82.8%
Assisting small business owners to commercialize their innovations	18%	46.7%

Reasons for their Engagement - Synergistic Effects

Knowledge

Input-
Output

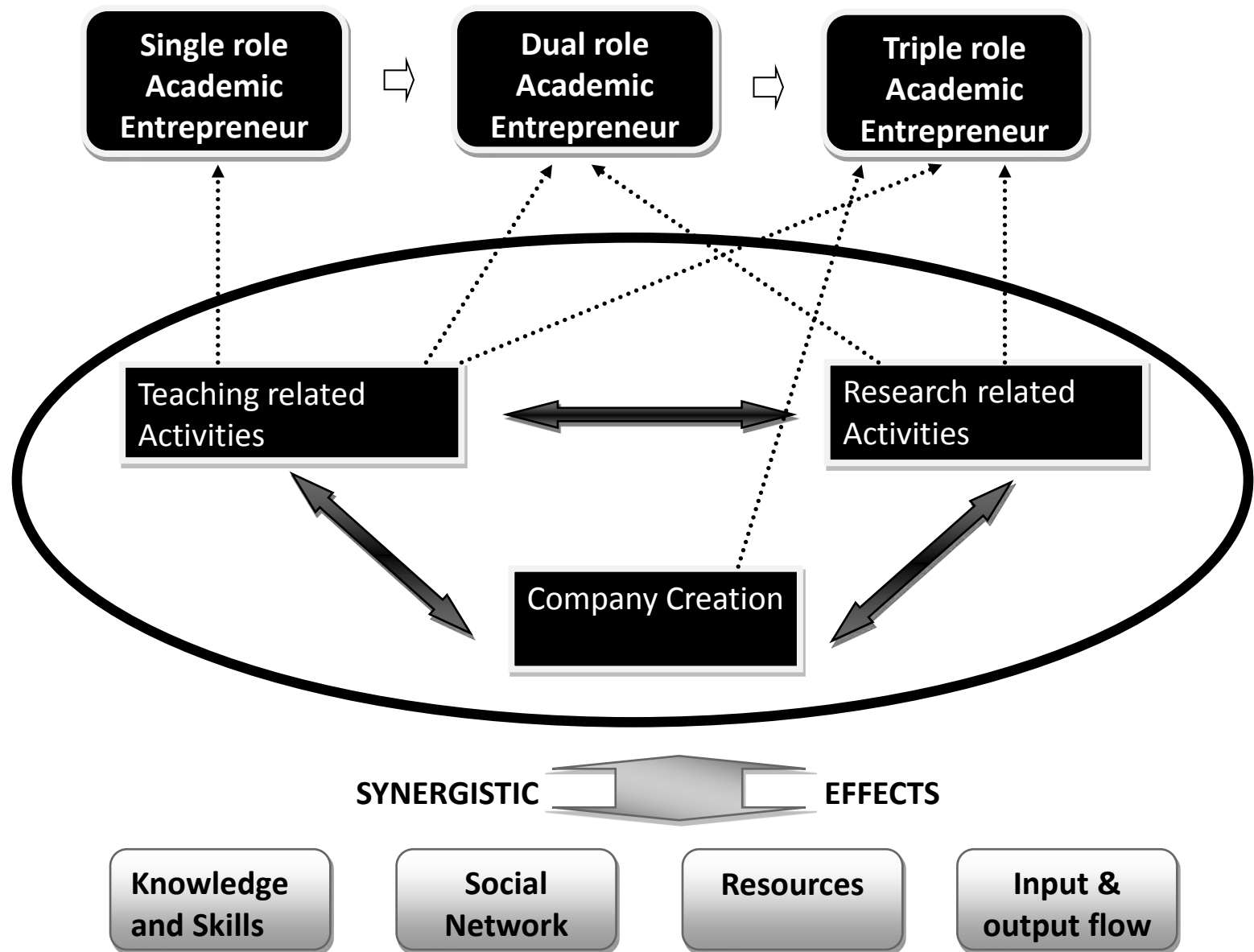
H 3:: In a resource constrained environment, unrelated diversification by academic entrepreneurs generates more synergistic effects than related diversification

Accepted

Social
Network

Resources

Framework –The Typologies of Academic Entrepreneurs and Synergistic Effects



Policy Implications

- It is important to recognize the importance of **synergistic effects** emanated when engaging in a combination of academic entrepreneurial activities - as a strategy of overcoming resource constraints.
- The **sequence in which academics** add activities to their combinations (initially teaching related then research related and finally company creation) highlighted the importance of considering academic entrepreneurship as a process
- It is important to nurture the process rather than merely pressurising academics to create business ventures

Future Research Avenues

- The effect of **micro, meso, and macro level factors** which will explain the existence of different academic entrepreneurs.
- What is the contribution of different diversification strategies **to normal academic duties?**
- The **impact of the existence of different A.E** in a given environment. It may be the case that optimal benefits as a university could be derived by having all these typologies.
- A similar research in a developed country context (in a recession) to investigate **the importance of synergistic effects** in such contexts by considering a combination of academic entrepreneurial activities that academics are engaged in.

THANK YOU !

Additional slides

Opportunities

Situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends, or means-ends relationships

They further argued that opportunity recognition and capitalization do not necessarily try to achieve optimising or satisfying decisions through means and instead he or she creates means and /or ends which are not recognised by others.

Teaching related	Research related	Company creation
<p>(1) External teaching (Jones-Evans 1997; Klofsten and Jones-Evans 2000)</p> <p>(2) Initiating the development of new degree programmes</p> <p>(3) Placing students as trainees in the industry</p> <p>(4) Conducting seminars and training sessions for industry (Schmoch 1997; D'Este and Patel 2007)</p>	<p>(1) Informal exchange of knowledge with industry</p> <p>(2) Working in the industry</p> <p>(3) Research based consultancy for industry through the university (Glassman et al 2003; Jones-Evans 1997; Louis et al 1989; Goldfarb and Henrekson 2003)</p> <p>(4) Research based consultancy privately (but without forming a company)</p> <p>(5) Developing products or services with potential for intellectual property rights (Glassman et al 2003; Jones-Evans 1997; Siegel et al 2004)</p> <p>(6) Acquiring funding from government, non-governmental or international bodies (those without collaborations with industry)</p> <p>(7) Collaborating with industry through joint research projects (Louis et al 1989; Calvert and Patel 2003)</p> <p>(8) Assisting small business owners to commercialize their innovations</p>	<p>(1) Contributing to the formation of joint ventures in which university and industry are the joint partners (Louis et al 1989; Goldfarb and Henrekson 2003; Hall et al., 2001)</p> <p>(2) The formation of joint venture/(s) privately through collaborating with industry</p> <p>(3) Contributing to the formation of one or more new spin-off companies (Radosevich 1995; Samson and Gurdon 1993; Daniels and Hofer 1993; Jones-Evans 1997; Louis et al 1989; Goldfarb and Henrekson 2003; Clarysse et al., 2005; Di Gregorio and Shane, 2003)</p> <p>(4) Contributing to the establishment of university incubators and/or science parks</p> <p>(5) Contributing to the formation of university centres designed to carry out commercialization activities</p> <p>(6) The formation of your own company/(s)</p>

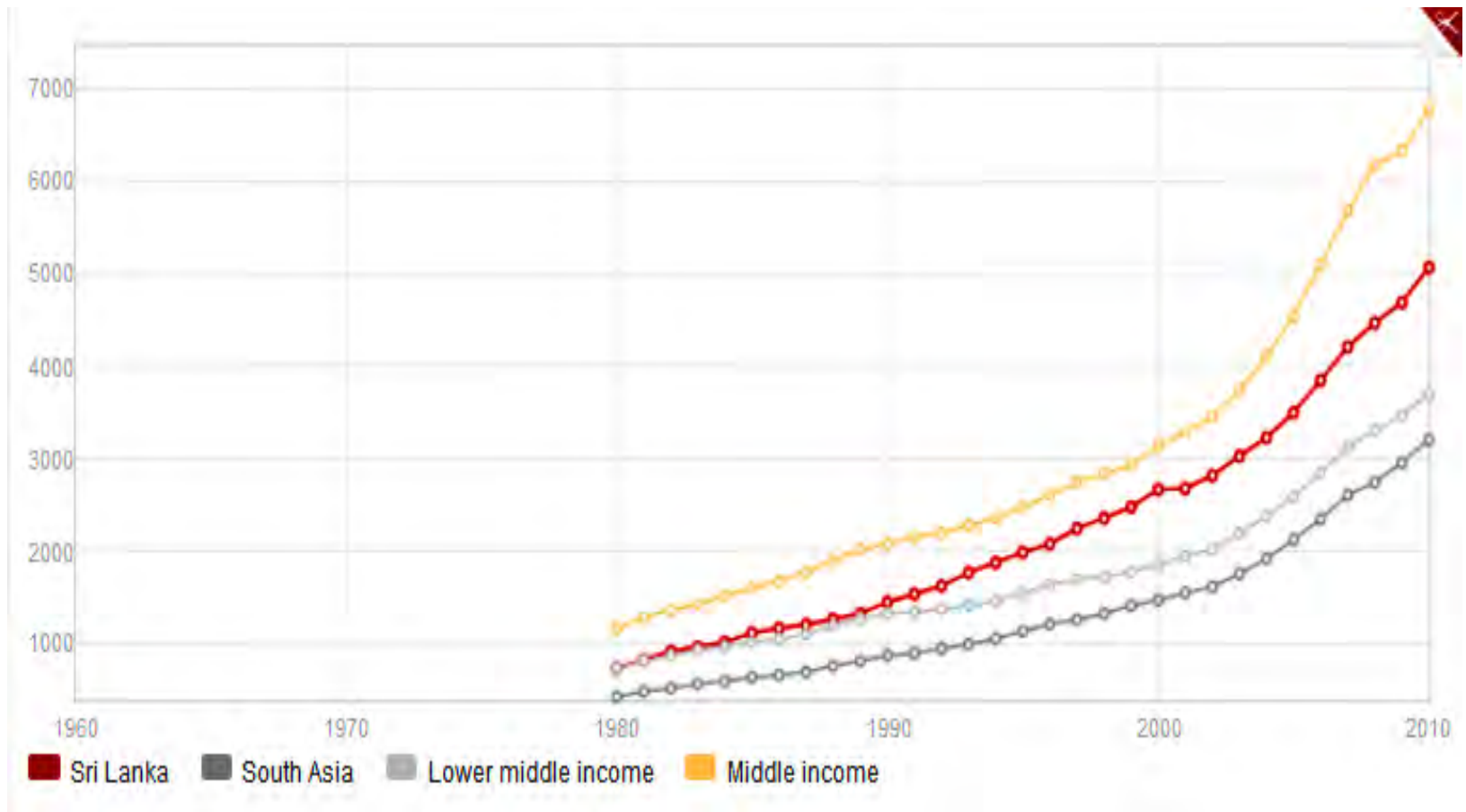


Figure 2.2: GNI per capita, PPP (current international \$)

Source: The World Bank (2011)

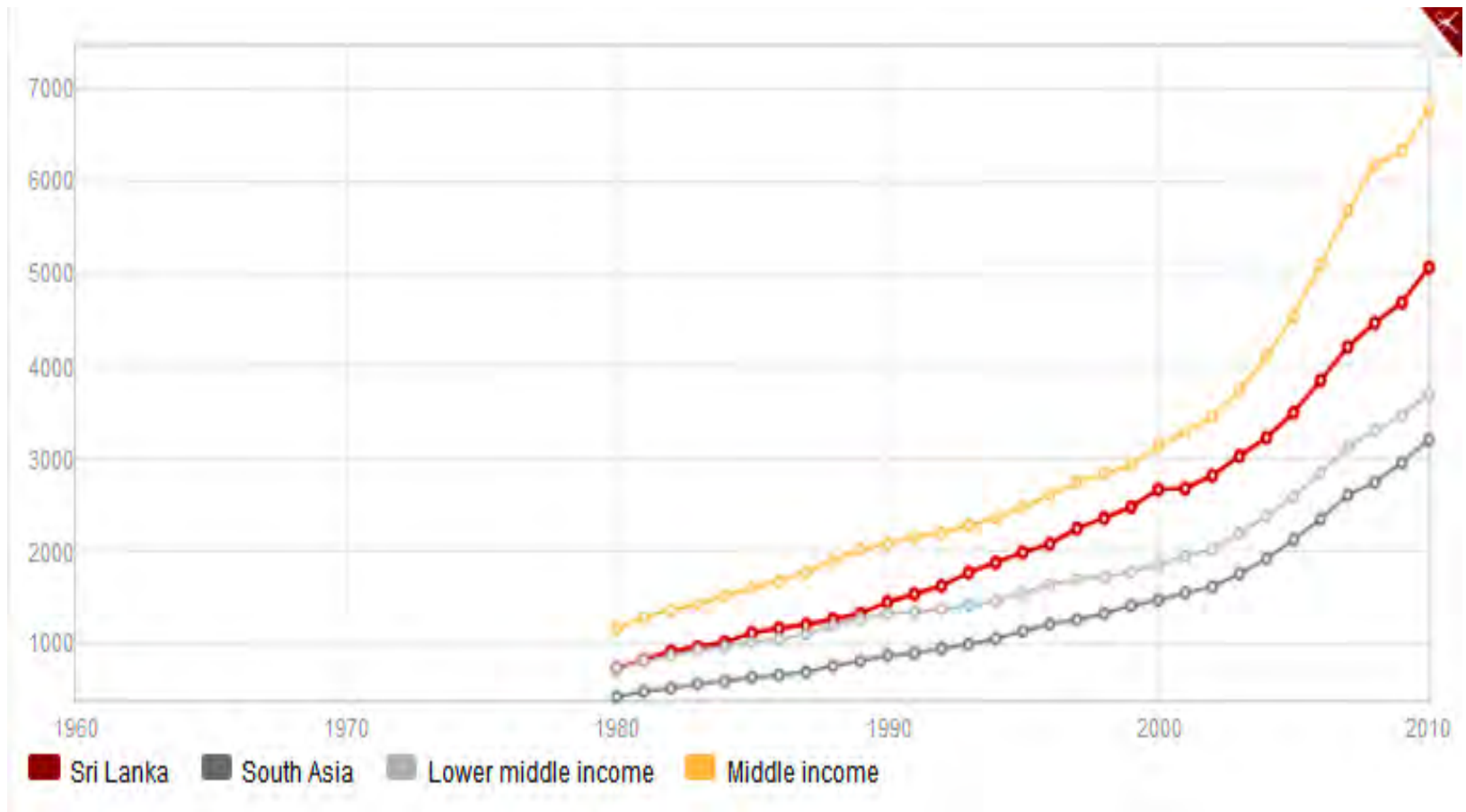


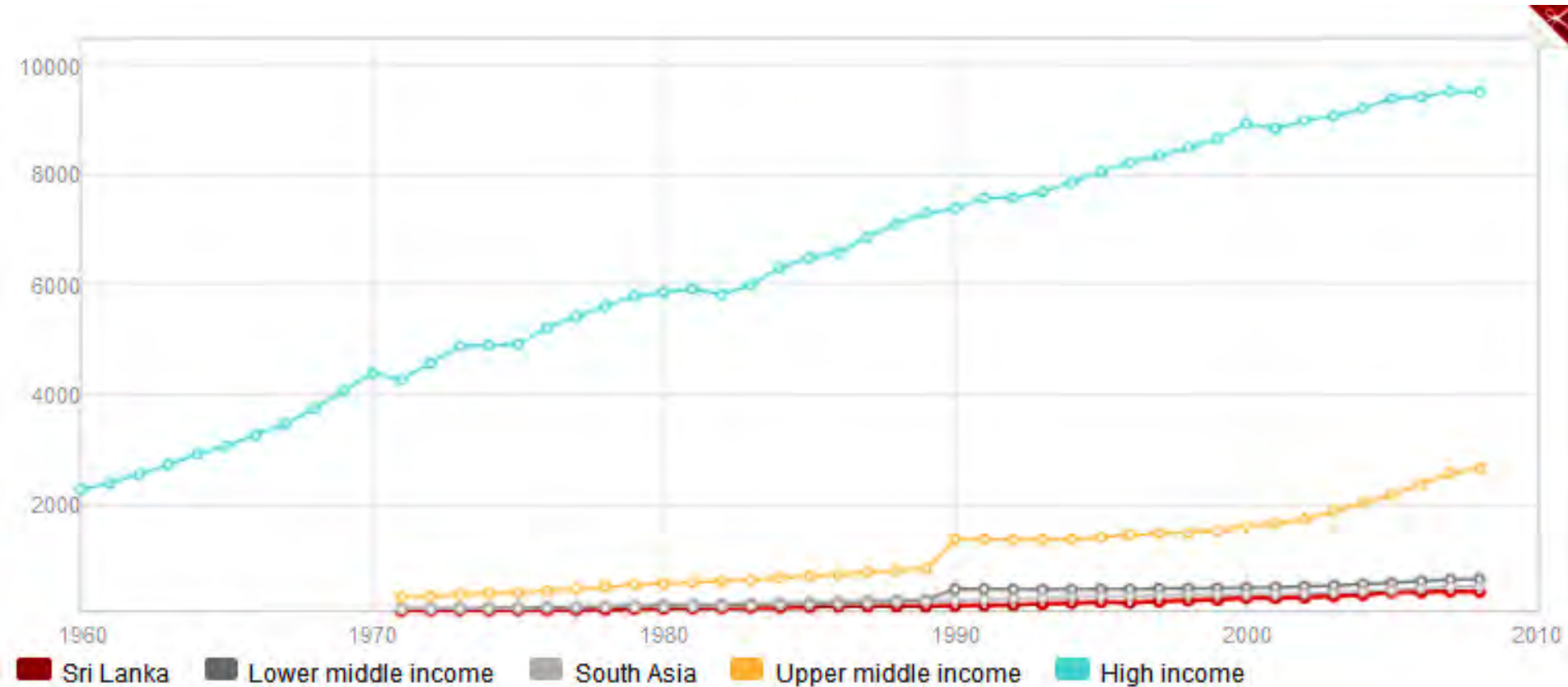
Figure 2.2: GNI per capita, PPP (current international \$)

Source: The World Bank (2011)

Human Resources in Sri Lanka

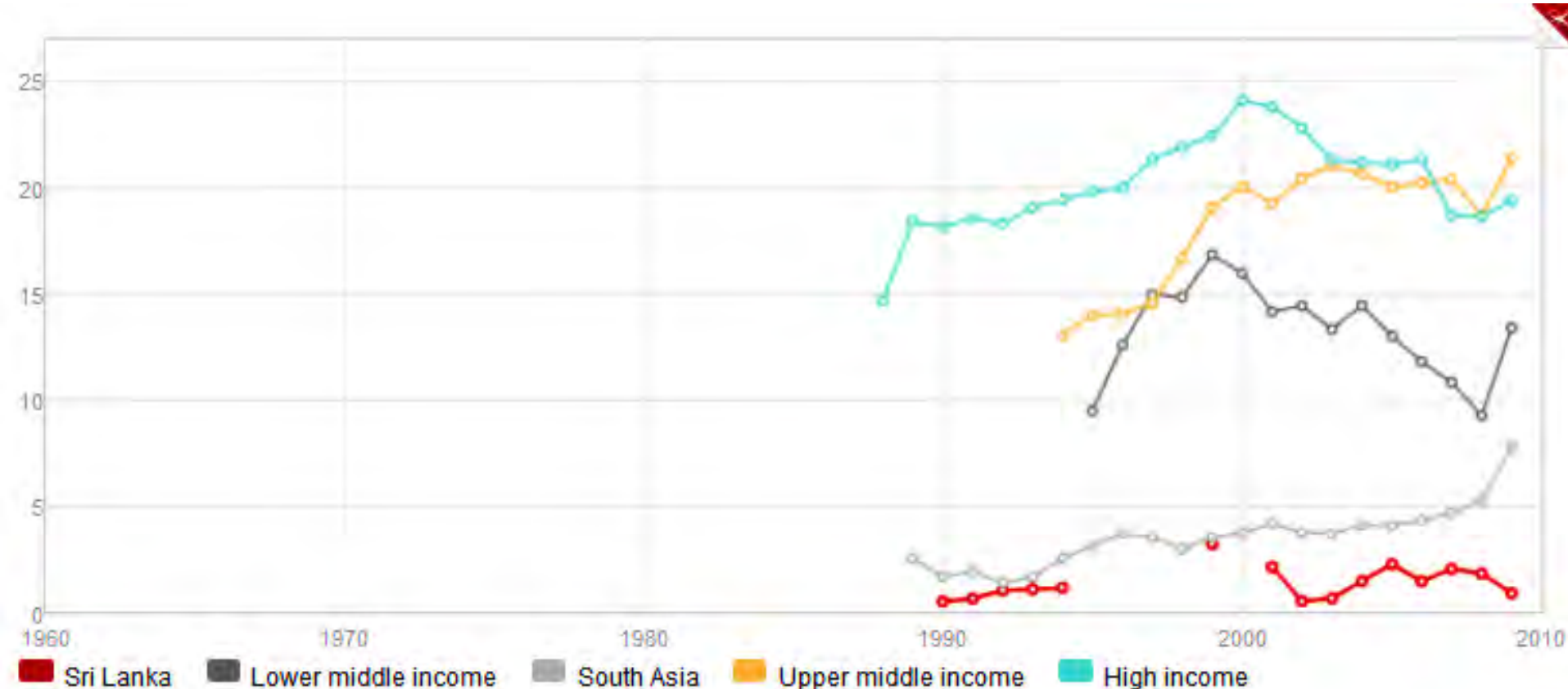
The number of researchers per 1 million people in 2006 was only 93 while that in developed nations (e.g. UK- 2909, USA-4584 , Australia-4230), and some of the developing countries (e.g. India-130, Indonesia 706, Malaysia – 371) was significantly higher. Brain drain, which is a phenomenon of the emigration of high skilled labour, has been identified as one of the major reasons that weaken the human resource base of Sri Lanka (Asian Development Bank 2008).

Infrastructure Facilities in Sri Lanka



Electric Power Consumption (kWh per capita)

Technological Resources in Sri Lanka



High-technology exports (% of manufactured exports)

Institutional Resources in Sri Lanka

	1996	1998	2000	2002	2003	2004	2005	2006	2007	2008	2009
Voice and Accountability	41	45	40	44	42	45	41	40	35	34	32
Political Stability and Absence of Violence	4	11	9	20	21	15	11	8	5	5	12
Government Effectiveness	35	47	45	53	51	40	39	47	49	44	49
Regulatory Quality	63	59	61	58	56	53	45	48	46	43	43
Rule of Law	51	51	55	58	56	54	55	57	56	54	53
Control of Corruption	41	51	50	51	49	50	46	54	57	55	45