INSTITUTIONALIZATION OF RESEARCH AND DEVELOPMENT (R & D) as the launch pad for Nigeria's Technological Revolution

By

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Summary

- Science and Technology (S&T) drives and shapes contemporary society and civilization .The level of investment by governments in innovative research and development and education overall invariably determine the global competitiveness of their nations. Massive and qualitative human capital development with emphasis on technology and product development are factors responsible for the sustainable economic development of the more advanced nations of the world with **Israe**l and the so called ***Asian Tiger Nations*** *as easily the best reference in progressive transformation in the last half century .With the advantage of both human and natural resources ,Nigeria has the potential to effect policy corrections to pace up its competiveness. TETFUND has elected to promote and support the Institutionalization or R&D through innovative best practices in our tertiary institutions thereby creating the platform for the researcher to patent and develop their findings as a transformative imperative and sustainable driver of the economy.*

What is R and D ?

The Progressive Pathway to R and D:

- ✓ Pure/Basic Research
- ✓ Strategic Basic Research
- ✓ Applied Research
- ✓ Experimental Development or R and D is
  - ✓ “Primarily undertaken for technological advancement to create new, or improve on existing materials, products or processes, including their incremental improvements” (Fawole, et al; 2005; Alade, et al, 2014)

- ✓ R and D best practices:
  - ✓ The “Asian Tigers” have or share development/policy instruments in common, which include, but are not limited to disciplined and accountable governments, heavy investment in human capital, particularly in S and T capacity for R/D to drive industrial development based on export promotion, etc.

What is R and D ?

(i) **Thresholds of R and D:**

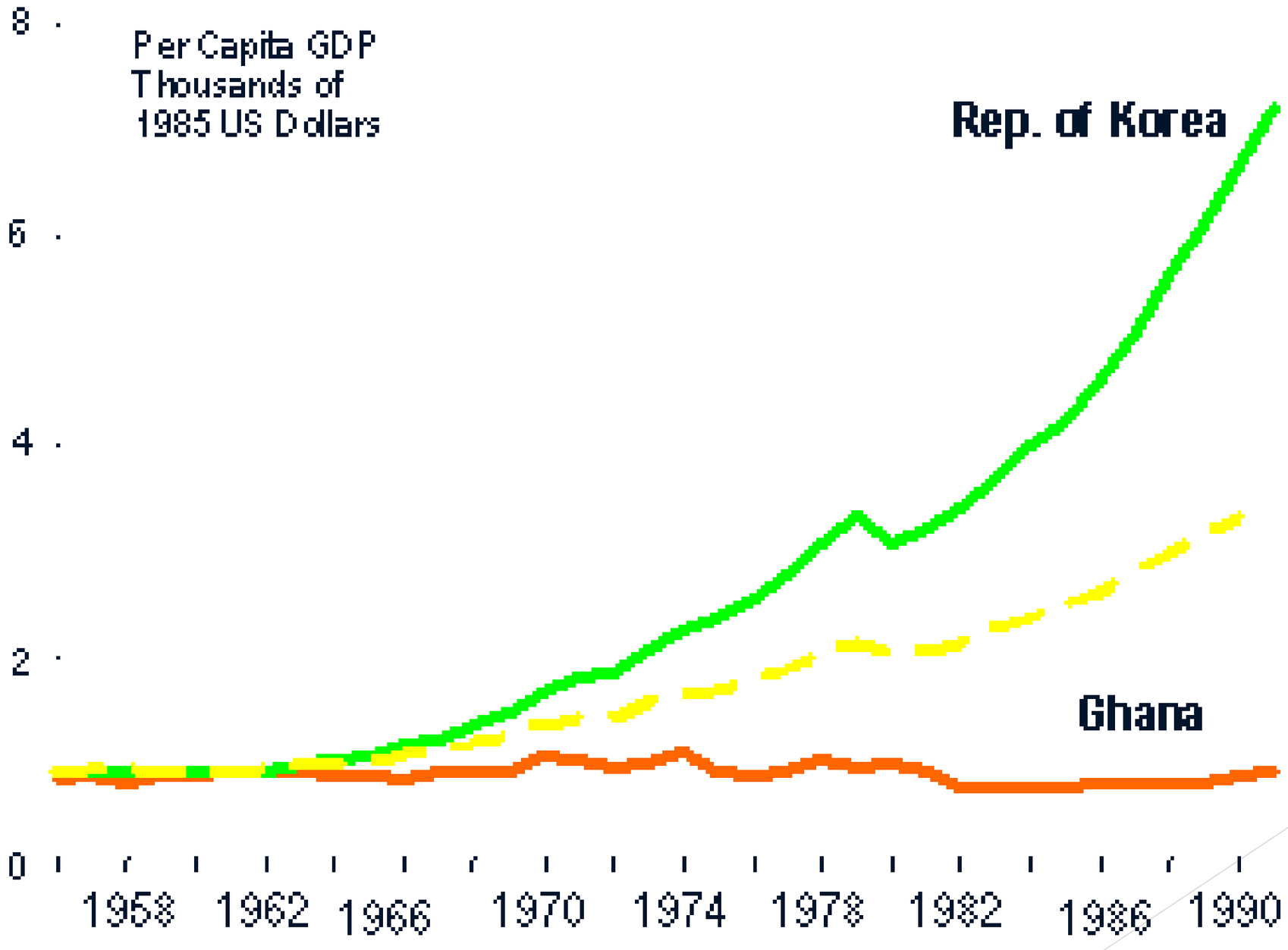
In most western countries, 70% of R and D funds come from the industrial sector. In Nigeria, only 0.2% comes from the industrial sector

- For me, R and D was the objective in my Ph. D. thesis that led to the “Innovation and application of a rumen fermentation model (Bogoro 1997) for the stoichiometric evaluation and nutritive value prediction of ruminant animal feeds”
- The successful application of the fermentation model with statistical modelling could go a long way in not only stimulating the nutritive value of form feeds, but more importantly, the stoichiometric value of the massive forages and protein–energy supplements available to a State or Nation at large.
- It also provided the basis for the stimulation of the in-viro production of CH4 methane, which constitutes 22% of green house gases with its environment implications.

The global picture of R and D:

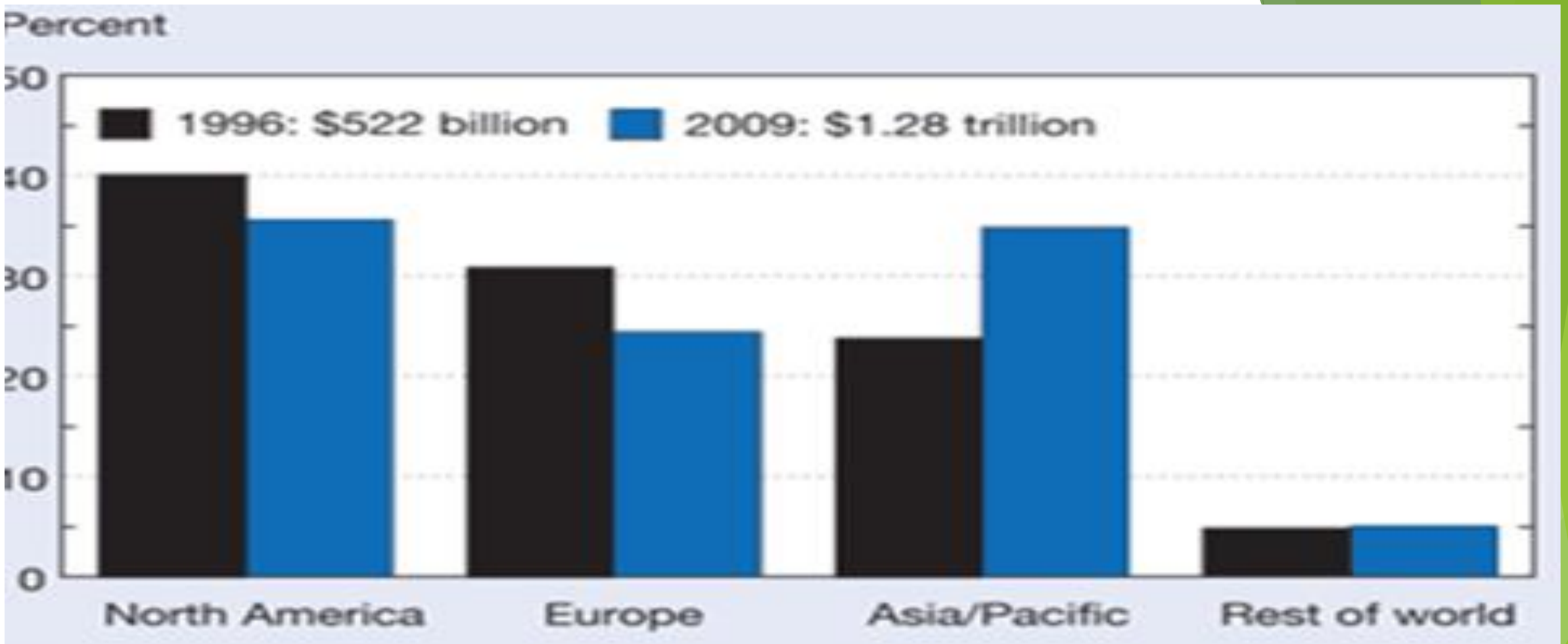
(As in graphical presentations)

Knowledge as a Key Factor in Economic Development



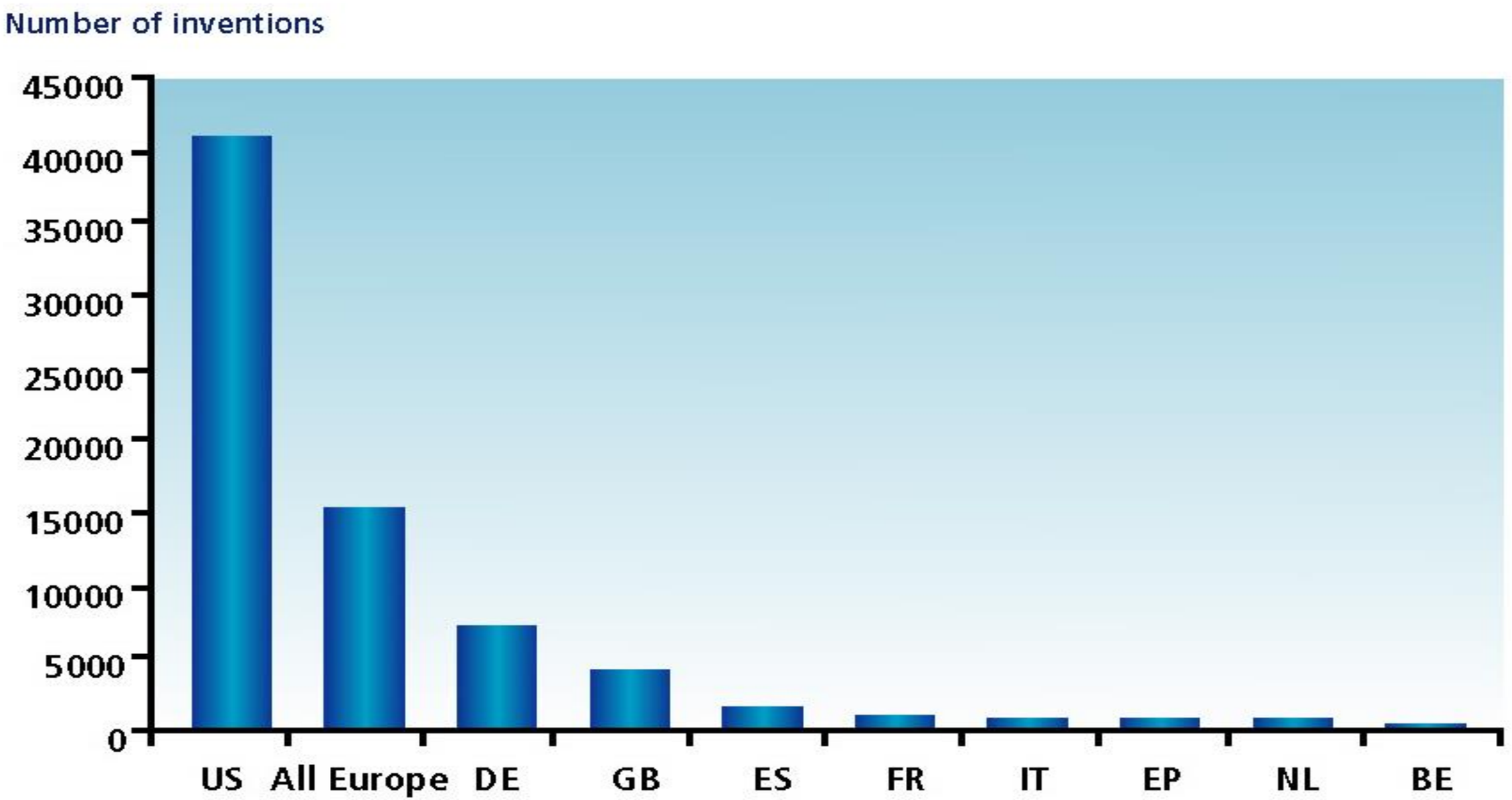
Difference attributed to knowledge

Difference due to physical and human capital

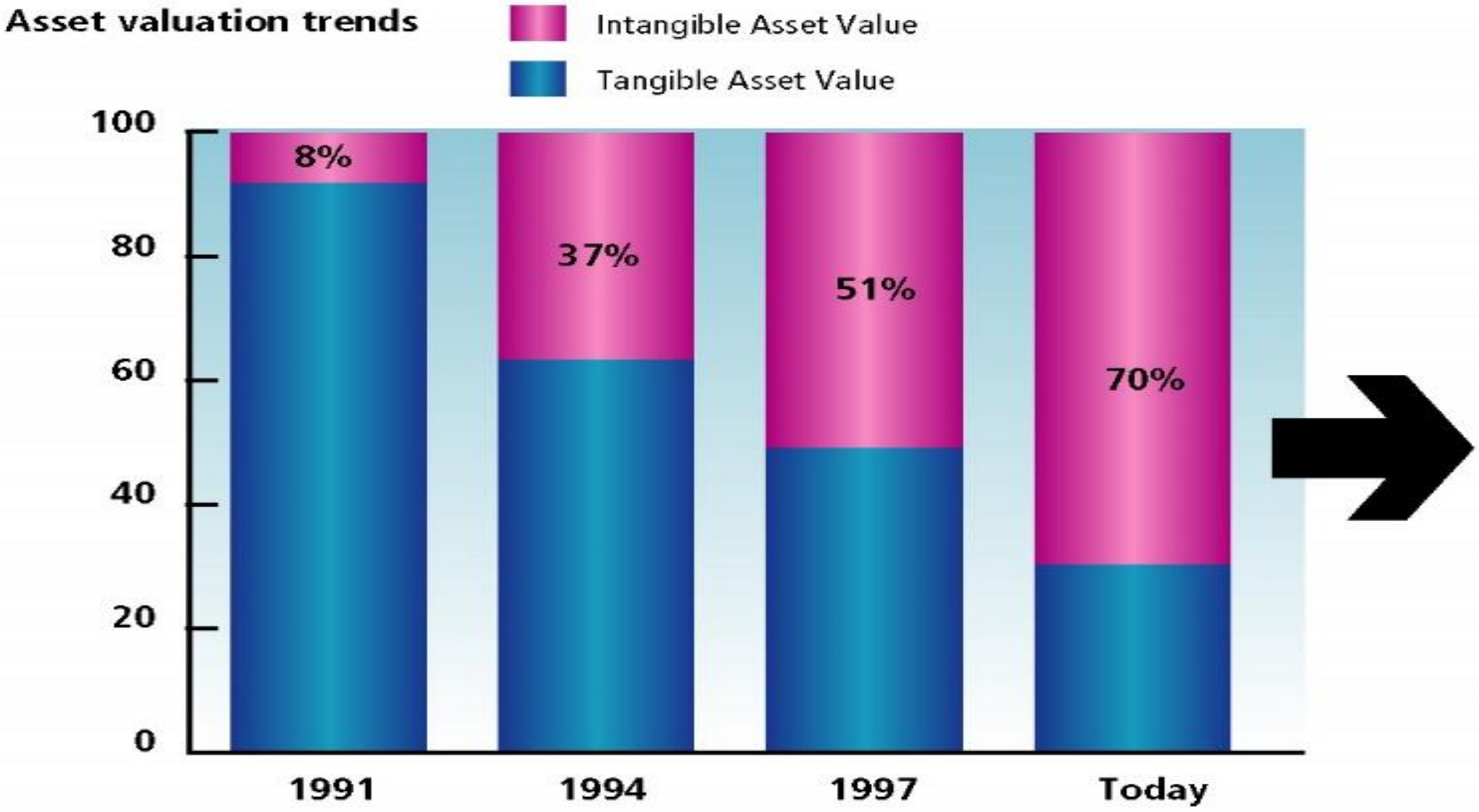


SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, special tabulations (2011) of Organisation for Economic Co-operation and Development, *Main Science and Technology Indicators* (2011-1 and previous years) and United Nations Educational, Scientific and Cultural Organization Institute for Statistics, http://stats.uis.unesco.org.

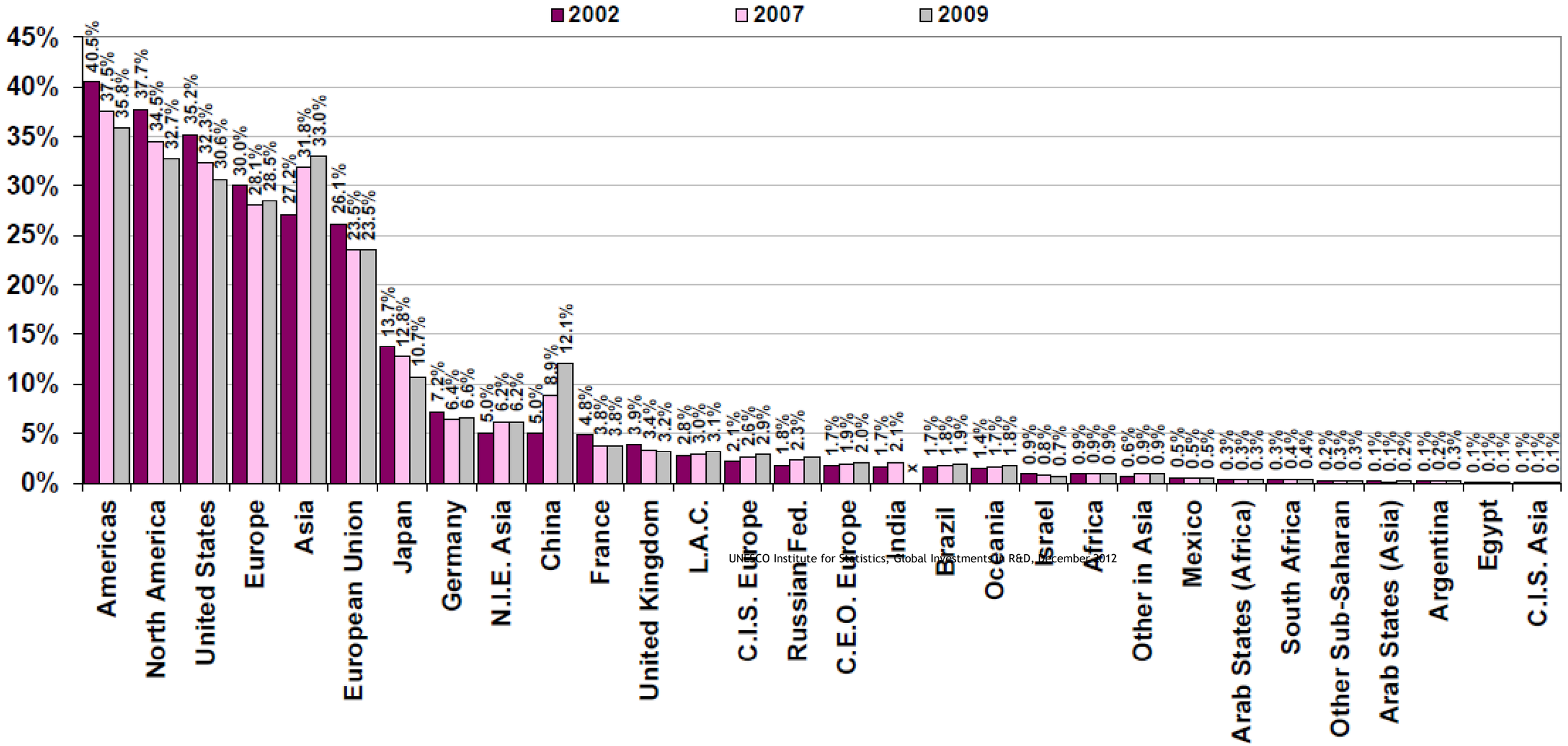
US vs EP number of inventions at universities



Wealth creation - increasing value of Intangible Assets

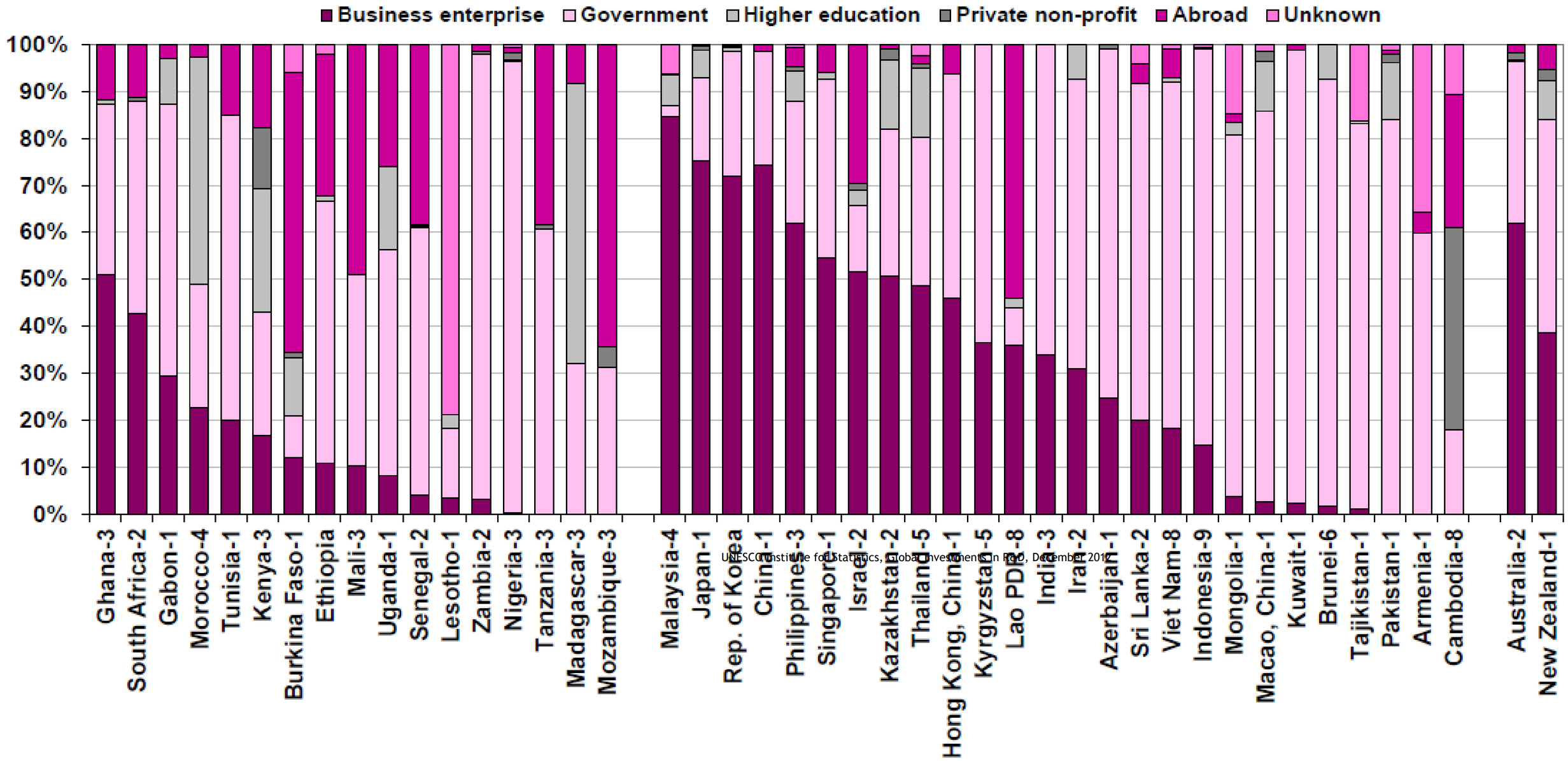


Distribution of global R&D



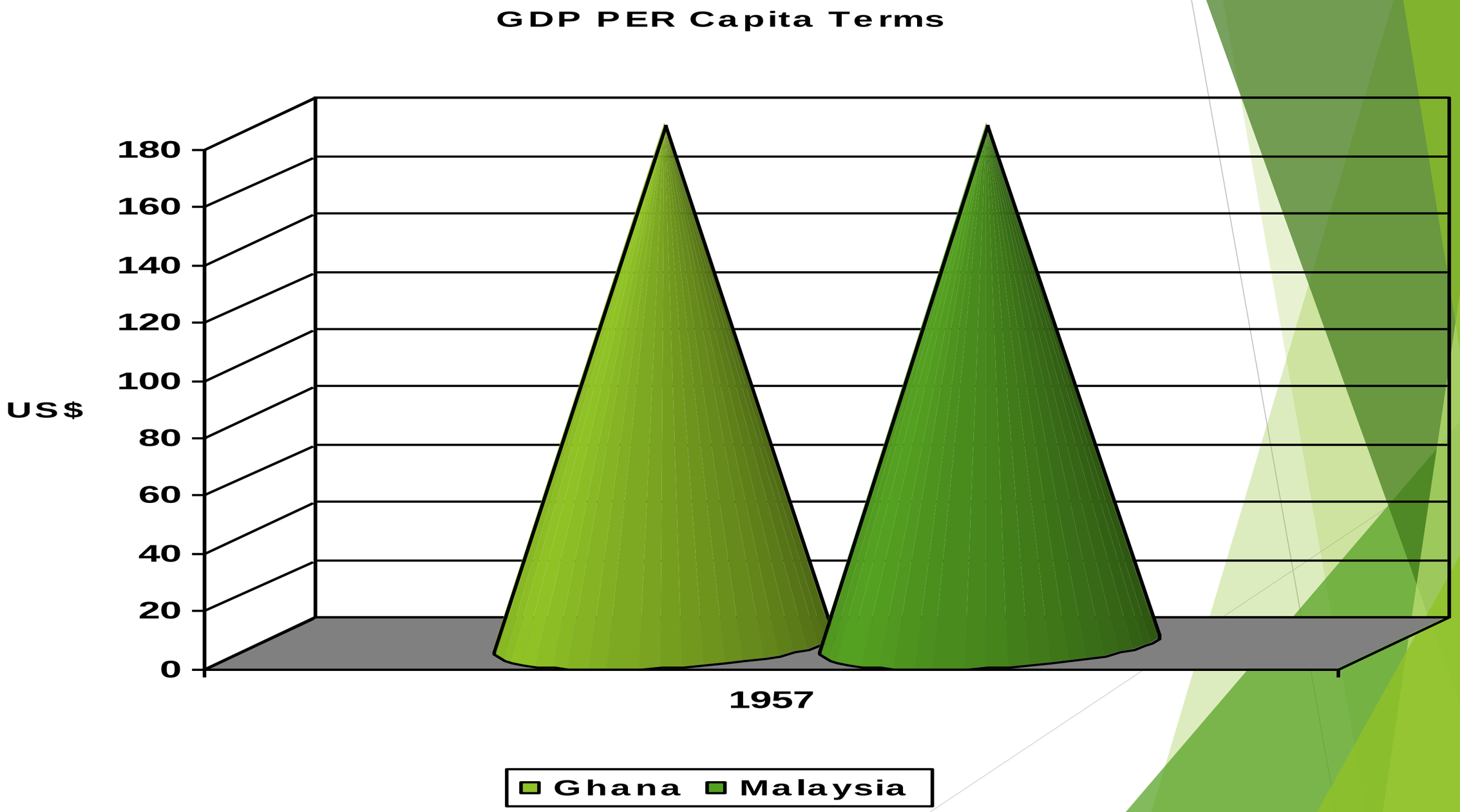
UNESCO Institute for Statistics, Global Investments in R&D, December 2012

R&D sectors – Africa, Asia, Oceania

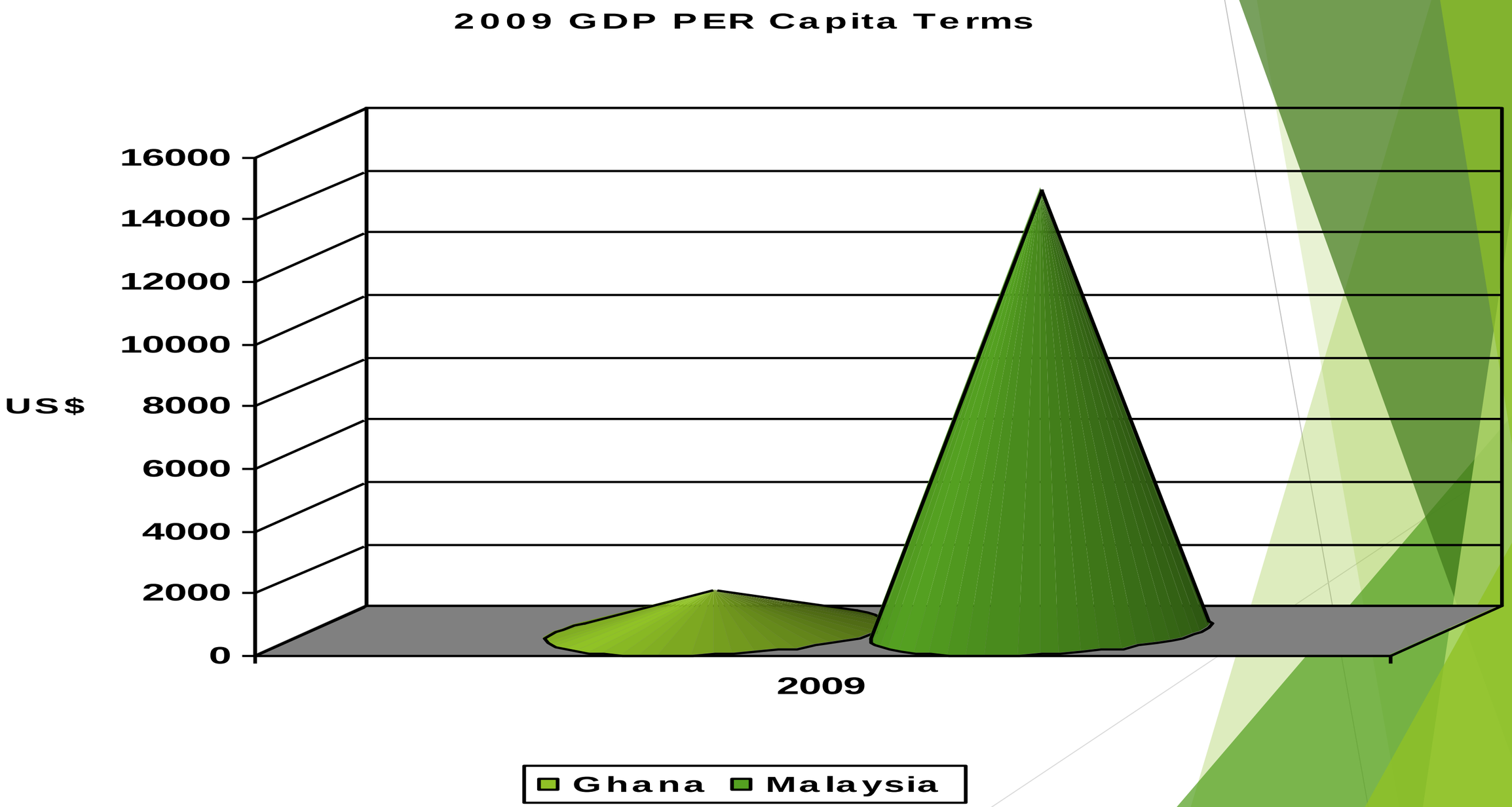


UNESCO Institute for Statistics, Global Investments in R&D, December 2016

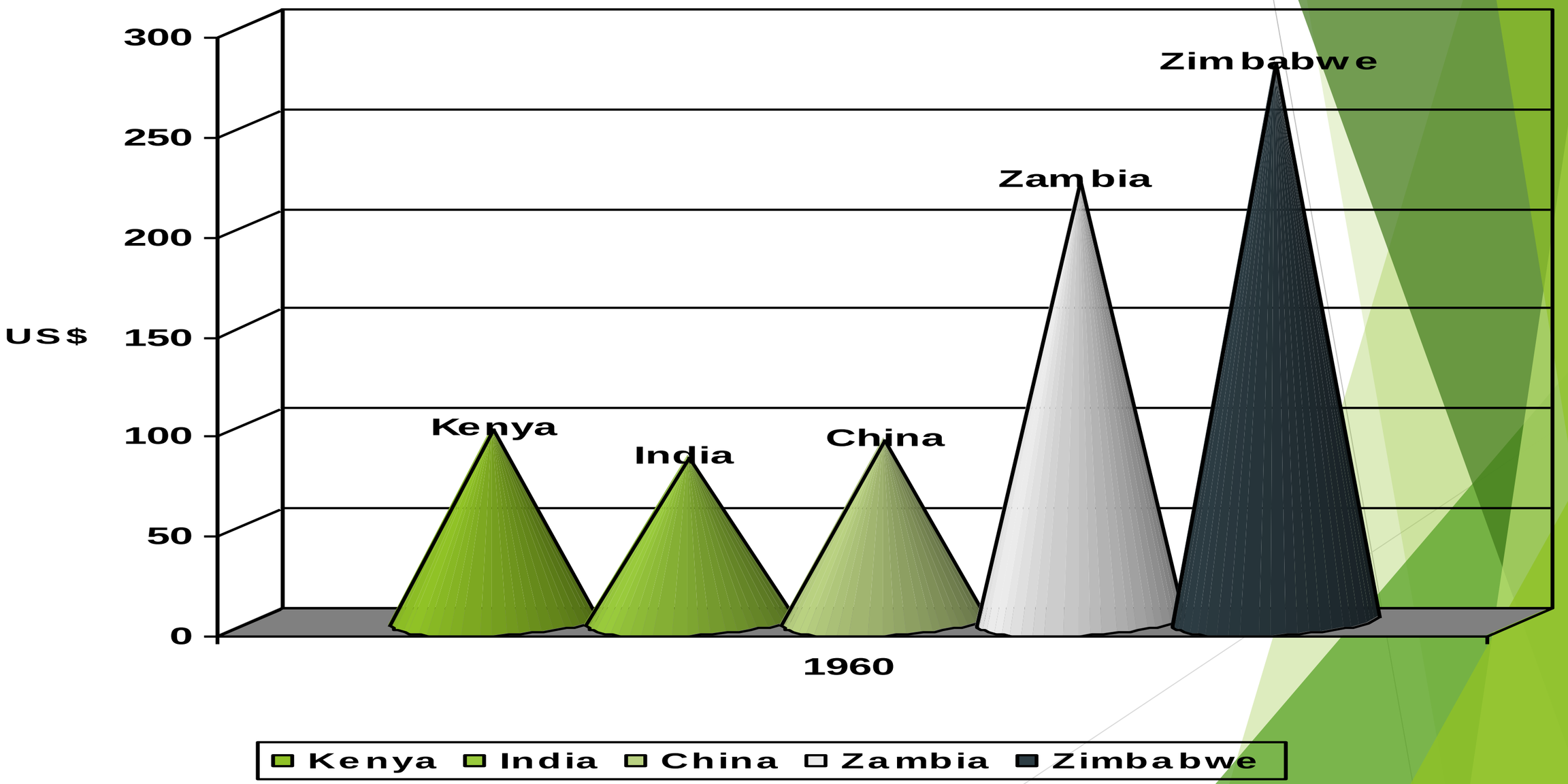
Ghana and Malaysia: 1957



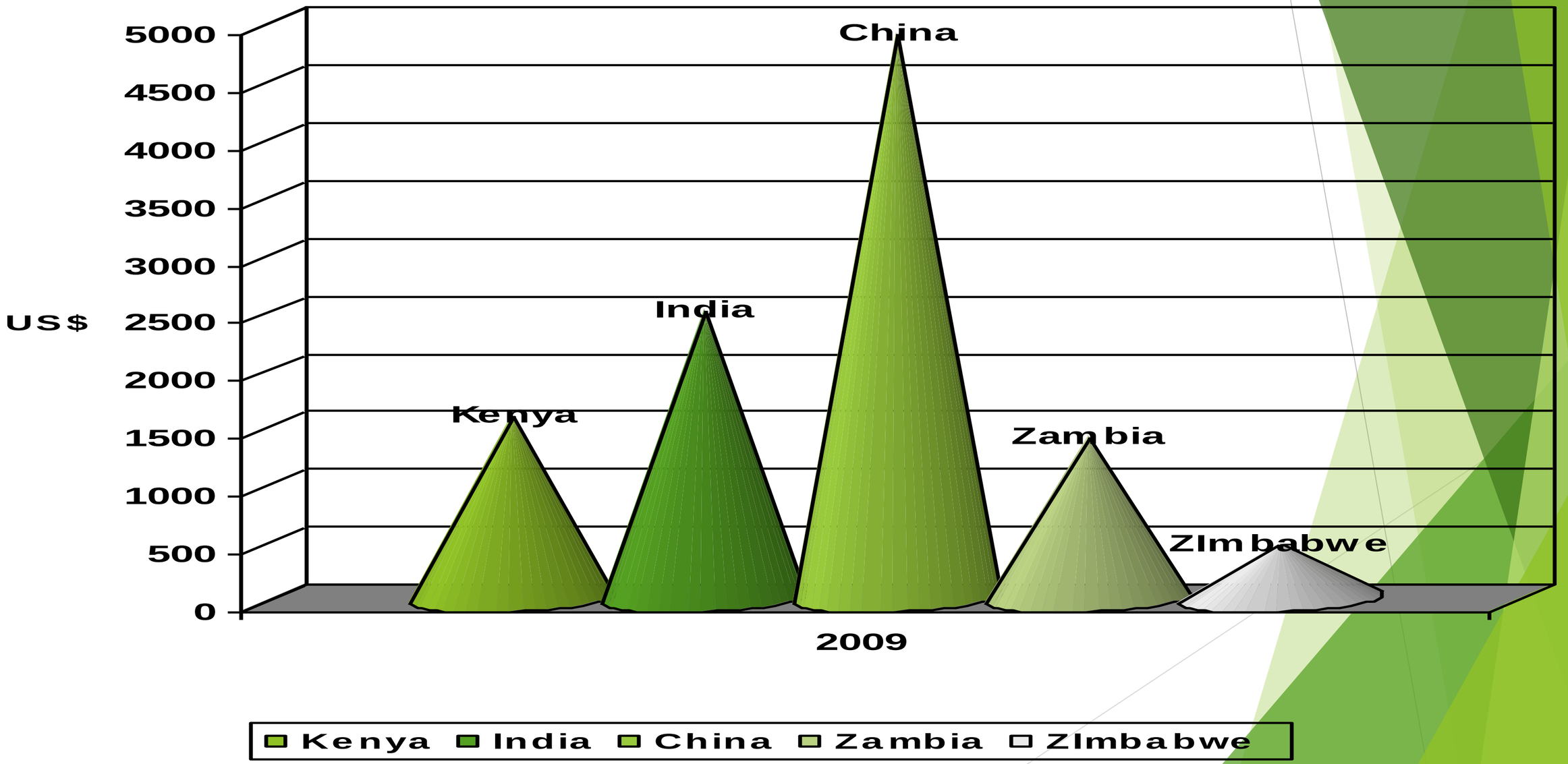
Ghana and Malaysia: 2009



Per Capita Comparative Analysis: 1960



Per Capita Comparative Analysis: 2009



What is the catalytic effect of R and D in modern economies?

While tangible assets could sustain governments for some years, intangible asssets like human capital, innovation and nationalism as in the cases of Israel and Japan, constitute the real development guarantees for generations

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•Knowledge is a key factor in economic Development - the Ghana vs Korean example (Shevel, 2014)

*** The most competitive nations have the best educational systems, with a bias for Science and Technology**

The motivation for TETfund's interest in promoting R and D:

(i) The inadequacy of incentives for Research and Innovations in tertiary institutions

(ii) The need to comply with global trend in making R and D the launch pad of Nigeria's quest for an enduring knowledge-driven technological and economic development

(iii) The need to support not only Access but also Quality as the twin pillars of the regulatory agencies in our tertiary institutions, being NUC for universities, NBTE for Polytechnics and NCCE for Colleges of Education.

(iv) Institutional arrangement in tertiary educational institutions and research institutes

(v) Sustained stakeholder advocacy by civil society, profit-motivated industries, etc

The need for the establishment of a National R and D Foundation:

To ensure a coordinated national framework for the sustenance and implementation of R and D, the logical institutional arrangement will require the establishment of a **National R and D Foundation**, which shall be responsible for the promotion and implementation of R and D policy on a regulatory, rather than executionary basis.

Such a foundation when established by law, shall promote an effective interface between research centers or tertiary institutions, government and the private sector, especially the industrial subsector of the economy.

The Tasks ahead in driving sustainable R and D through quality needs-based research, technology-driven innovations and private sector-led funding and incentives:

(i) Identification and promotion of key partners in the promotion, advocacy and implementation of R and D in Nigeria:

* Government
* The private sector
* Tertiary Educational institutions , Research Institutes and Centres of Excellence
*ASUU, ASUP, COEASU, etc

(ii) Establishment and sustenance of the Departmental structures to drive the promotion of R and D in TETFund including the appointment of a statutory Committee and provision of funds to service its oversight activities

(iii) Evolution and sustainability of a robust and competitive economy through the pedestals of R and D, relevant innovations and endogenous technology

Conclusion

1) The University and Research Institutes have been, and remain the apex of knowledge generation world-wide.

2) With knowledge, jobs and wealth are created, poverty is mitigated and global competitiveness enhanced.

3) Rapid advances in economic development & Human Development Index (HDI) have become knowledge-based, private sector-led, S&T-driven and mainly government-facilitated via appropriate policy instruments.

4) Recent PISA (Prog Int Stud Assmt) study of 65 countries by the Organisation for Economic Cooperation and Development (OECD) shows a –ve correlation between education performance of students in a country & total earnings (% GDP) the same country derives from natural resources such as oil, gold, diamond, etc.

5) The study gives an insight into extant issues: countries blessed with natural resources are jinxed with what has been termed the natural curses or “Dutch Disease”. This is because countries caught in the lamentable vortex of burgeoning natural resources, almost, never go into manufacturing or innovative technology.

6) Nigeria can reverse all paradoxical indices of development through institutionalization and support for R and D.

7) TETFund has decided to play its role in this regard through partnership with Tertiary Institutions, Research Centres, Regulatory Agencies and the Private Sector.

References:

1. Aletor, V A; Olatunji Oyelana and Bogoro, S E (2014); Harnessing Nigeria's endogenous Research and Innovation outcomes for food and nutrition security. WARIMA 2014. Paper presented during the 2014 WARIMA International Conference held at the Elizade University, Ilara-Mokin, Ondo State, Nigeria, October 24-26, 2014.

2. Bogoro, S E (2005); Simulation of the Biological Engineering Efficiency of the Ruman towards national food security; Being the 34th Inaugural Lecture of the Abubakar Tafawa Balewa University, Bauchi, July 2005.

3. Shevel, J (2014); Enhancing University-Government-Industry Research and Innovation Partnerships for Local Relevance and Global Competitiveness: The Israeli Experience

Thank you and God Bless