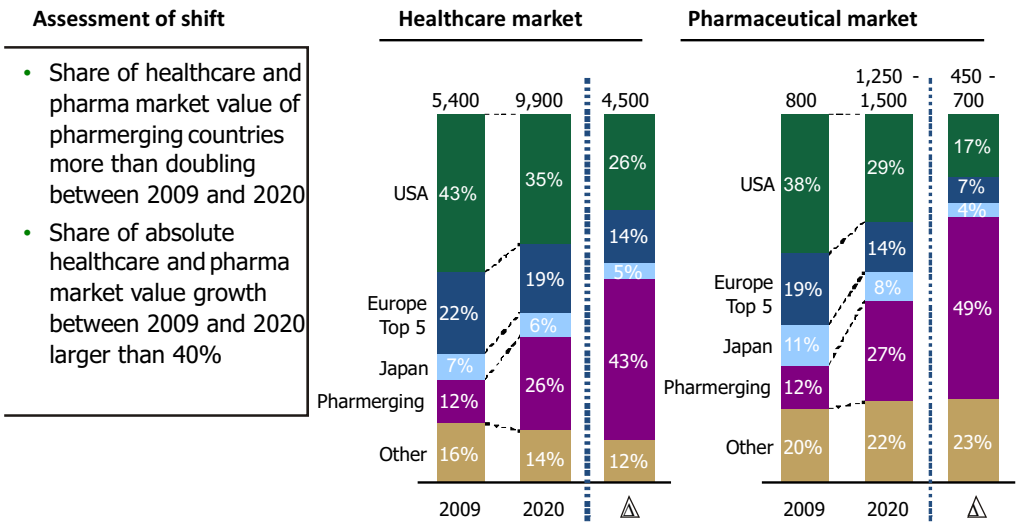
Global pharmaceutical companies are re-looking at their R&D processes in order to leverage the opportunity presented by emerging economies, such as India, in contract research. Besides offering the opportunity to save costs tactically in the short term, this is also a strategic move to improve productivity and develop further capabilities in order to compete successfully in the future, while staying close to geographies which will drive future growth; say ***Aleksandar Ruzicic*** *of Roland Berger Strategy Consultants and* ***Jeffry Jacob*** *of Tata Strategic Management Group*

Matching R&D footprint with long-term growth in emerging markets

Globally pharmaceutical companies are under immense pressure with existing business models under threat. The growth is expected to taper off in the US and other developed countries while emerging economies are expected to drive a large part of the future growth. Until 2020, pharmerging countries will represent more than a quarter of the healthcare and pharma market value globally. These markets will contribute almost half of the absolute growth for both the healthcare and pharmaceutical markets (Refer Figure 1). Hence, it does not come as a surprise that pharmaceutical companies have started to boost their footprint and presence in these locations and also elevated these regions organizationally. For example, GlaxoSmithKline has created an Emerging Markets unit in June 2008 headed by Abbas

Fig. 1: Geographic shift towards pharmerging markets (USD Bn)

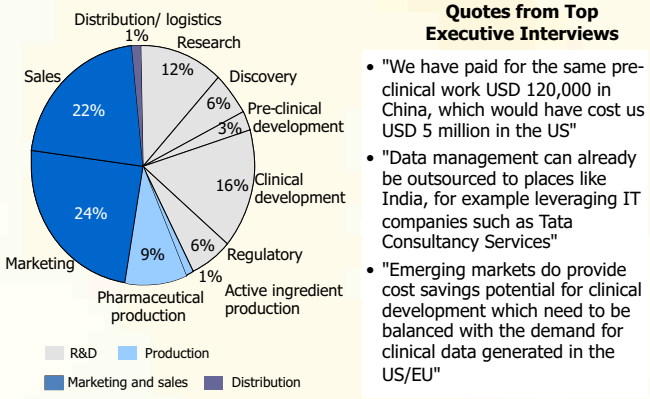


Source: EIU; OECD; WHO; IMS; Roland Berger

Hussain and executed numerous acquisitions and direct investments resulting in a significant part of its workforce being located in emerging markets.

Declining productivity, relatively dry pipeline for new drugs, increasing penetration of generics and margin pressures have been leading to lower profitability for global pharmaceutical companies. This trend is expected to further intensify going forward into the future. This has forced companies to continuously adapt their cost structures,

Fig. 2: Core competencies across the value chain



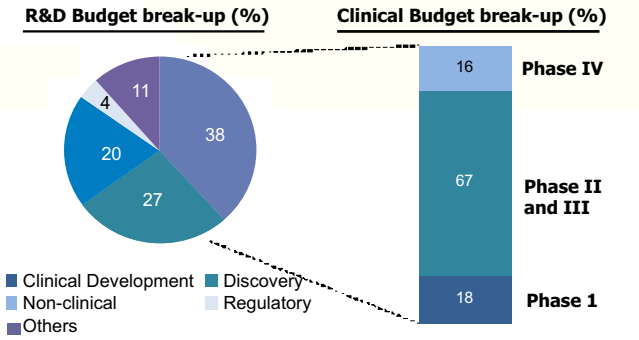
Quotes from Top Executive Interviews

- "We have paid for the same pre-clinical work USD 120,000 in China, which would have cost us USD 5 million in the US"
- "Data management can already be outsourced to places like India, for example leveraging IT companies such as Tata Consultancy Services"
- "Emerging markets do provide cost savings potential for clinical development which need to be balanced with the demand for clinical data generated in the US/EU"

QUESTION: What are the top 3 core competencies of your company concerning the following steps along the value chain?

Source: Top executive interviews; Roland Berger Survey 2007/2008

Fig. 3: Pharmaceutical Companies R&D Budget Split



A study by the Tufts Center for the Study of Drug Development concluded that:

- Pharma companies with high reliance on CROs stay closer to schedule than others
- CROs expand the speed and capacity of product development pipeline while maintaining high levels of quality
- CROs help companies reduce costs

Source: Secondary research, Zinnov, Tata Strategic Analysis

as exemplified by major multi-billion cost cutting/restructuring projects in all major pharmaceutical companies, as announced most recently in September 2010 by the Roche group that is not affected by imminent significant patent expirations.

The pharmaceutical industry is fundamentally re-evaluating the make-up of its value chain, differentiating clearly between core capabilities and those that could be potentially outsourced. Within R&D, particularly pre-clinical and discovery seem to be representing potential outsourcing opportunities, also driven by huge cost differences (Refer Figure 2 & 3). In the future, the pharmaceutical industry will be forced to capture the increasing benefits from emerging countries, particularly given the long-term benefit from matching better its global work force footprint to the future geographic distribution of revenues.

The initial wave of pharma outsourcing was successfully witnessed for manufacturing of Active Pharmaceutical Ingredients and off patent drugs. As late as 2006, contract

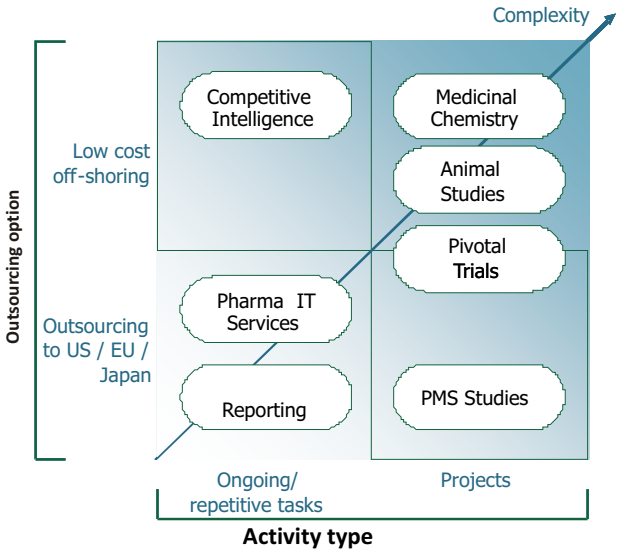
manufacturing accounted for over 70% of the revenues of the Indian CRAMS market. However post compliance with WTO norms on intellectual property, there has been a spurt of off-shoring activities in the areas of clinical development and manufacture of patented APIs and formulations, as well as discovery and pre-clinical services.

Multitude of key success factors in R&D drive relevance of emerging countries

Many key success factors for pharmaceutical R&D apply equally to all phases, such as the availability of highly skilled English speaking staff, adherence to quality and compliance, flexibility and agility given significant attrition, costs per unit (related for example to activity, FTEs, patients) and tight project management. In addition, exploratory R&D also requires IP protection, trained/ experienced scientists/ researchers, speed of learning/ know-how development, access to academia/ basic research labs, as well as access to funding whether public or private. In case of confirmatory R&D, the key success factors are driven by fast access to patients, local regulations for animal/ clinical studies, overall speed for critical path activities, e.g. data analysis upon database lock of clinical trials, access to product approval regulators and cost/benefit assessment agencies in key markets as well as strength of relationships with medical opinion leaders driving product adoption through international and national guidelines.

Pharmaceutical companies need to decide on their geographic footprint by assessing the various locations rigorously against the suggested key success factors. In addition, we suggest differentiating outsourcing decisions by activity type (differentiating ongoing/ repetitive tasks from projects) and outsourcing option (off-shoring leading to a strategic cost advantage vs. outsourcing within US/ EU/ Japan). Near and off-shoring seems to be equally driven by unit cost advantages, e.g. animal studies, as well as critical resource access, e.g. patients meeting clinical trial inclusion criteria, experienced medicinal chemists.

Fig. 4: Selected R&D examples by outsourcing option and activity type



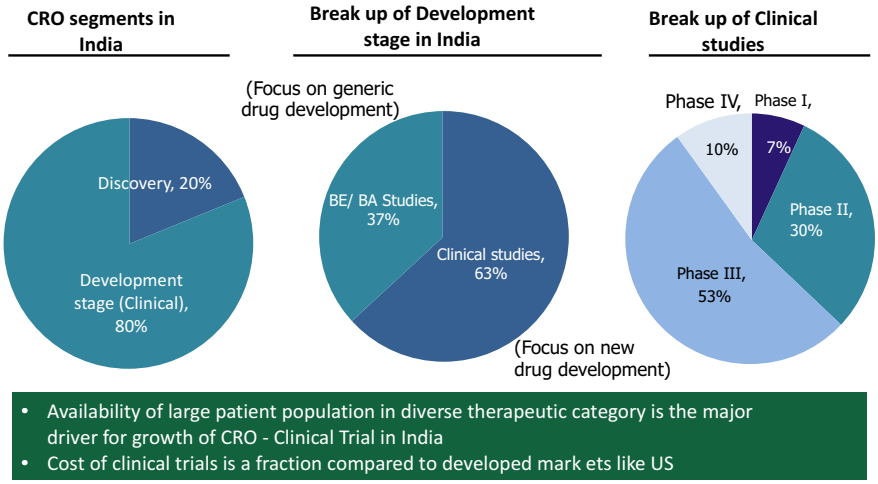
India's strong positioning on the key success factors

India's large population of 1.15 billion people translates into a vast patient pool and faster patient recruitment for clinical trials, which go a long way in meeting overall timelines faster. This results in substantial acceleration of the drug development time in addition to lower costs per patient. In addition, India has a large population of doctors and scientists, representing the largest English-speaking talent pool in some disciplines. For example, India produces three times as many master graduates annually in chemistry than the US. With the large number of DMF filings, technical competency is well established. It has the largest number of USFDA approved facilities outside US with GMP and GLP certifications. Intellectual property is respected and the laws are conducive to IP protection. Moreover, Indian strength in synthetic and medicinal chemistry makes it a lucrative destination for contract research, even for early research and discovery activities. Given the advantages of focus, cost and speed, the question is no longer about whether to outsource but rather of finding the right partners. Overall, clinical development, discovery and non-clinical services costs account for 85% of R&D budget which can be reduced by using CROs. In addition to cost advantages, multinational pharmaceutical companies benefit from staying closer to schedule and their ability to expand speed and capacity of their R&D operations while maintaining high levels of quality resulting in a much required boost of R&D productivity (Refer Figure 4).

Moving up the value chain ladder

Contract work in research/ discovery has evolved from low end research activities to more value added high end research. Reputation for research quality, speed in project execution, world class infrastructure, quality manpower, patent protection and strong client relationships are critical for growth of CRAMS. Currently clinical trials account

Fig. 5: Indian CRO Industry



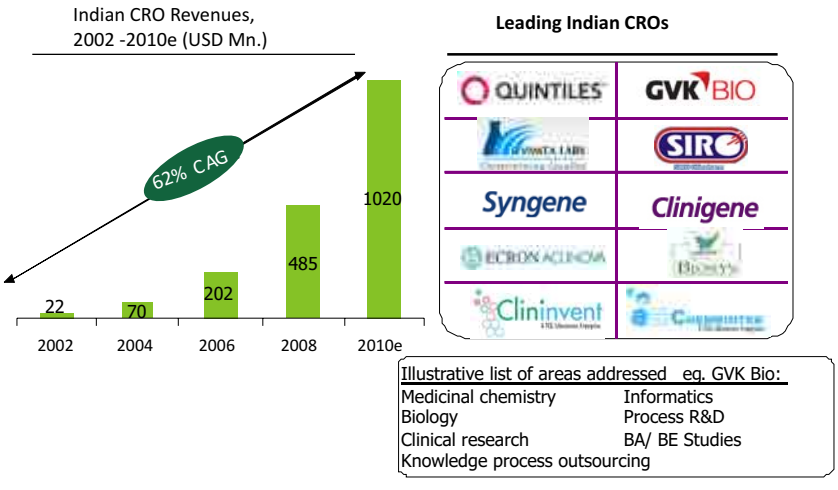
Source: Crisil Research, Tata Strategic Analysis

for the largest share of the Indian CRO market (Refer Figure 5). Increasingly, Indian CRAMS such as Jubilant Biosys are striving for end-to-end solutions, integrating a large array of services into a holistic offering, particularly within Discovery/ Pre-clinical. Furthermore, Indian CRAMS have also started to engage in performance-based contracts enabling them to retain a larger share of their value-added, as exemplified by the collaboration between Jubilant Biosys and Endo on the area of oncology.

Outsourcing in drug discovery occurs mainly in the following segments - broad based screening, genomic targets, chemistry and gene therapy. Therapeutic areas involved include oncology, infectious diseases, CNS, cardiovascular disorders, autoimmune/ inflammation and metabolic diseases. Currently Phase II-III has emerged as the most established component of clinical development. The adoption of new tools and techniques such as biotechnology, bio informatics, genomics etc. along with new IT solutions has brought about a change in the way new drugs are being developed and brought to market. This will increasingly drive outsourcing of research and development to India, also due to its strong IT services sector (Refer Figure 6).

Data management and early phase trials offer immense opportunities for CROs. There have been several Private Equity (PE) investments in the recent past, driven by current attractive returns and future potential. Actis' investment in Veeda Clinical Research, Kotak Private Equity Group and 3i Capital in Siro Clinpharm, OrbiMed in Ecron Acunova and MPM Capital in Sai Advantium are some examples. Actis Biologics is working together with the Malaysian government on new molecules for diabetes, anti-cancer diagnosis, and asthma and also jointly building the Bio-City Park in Malaysia. 'Developing country' diseases offer another area of huge potential where the focus of Western drug companies is currently limited. The long term arrangement between the Malaysian government and Vivo Bio for manufacturing malaria vaccine is one such example.

Fig. 6: Indian CRO Industry



Source: Secondary research, Zinnov, Tata Strategic Analysis

Contract research (and manufacturing) offers a long term strategic advantage

The nature of relationships between Indian CRAMS suppliers and the pharma companies is transitioning from transactional based to long term partnerships, often involving sharing and creation of joint intellectual property triggering performance-based milestone payments. Big pharma companies are also acquiring stakes in their CRAMS partners to secure supply and develop a stronger relationship.

It is a foregone conclusion that pharmaceutical and biotech companies need to relook at their business models if they have to successfully compete in the new environment. Contract manufacturing was just the tip of the iceberg. If companies have to be really successful and optimize their operations for better business results, they need to revamp their R&D process and capture the opportunity presented by emerging economies. Price realizations that the pharma companies have got used to may be a thing of the past, especially with focus on reducing final cost of dose by payers and governments even in the developed world. Off-shoring contract research (and manufacturing) services are therefore an opportunity to not just save costs tactically for the short term, but also a strategic move to improve productivity and develop further capabilities, while also moving closer to the future healthcare customers in developing markets.