

Idea to Impact Research Programme

Working Paper 1: Summary of the Triple Chasm Approach

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1. Abstract

This is a summary of the Triple Chasm approach and provides an overview the 5-part working paper which examines how science and technology enabled innovation is commercialised.

In **Part 1**, we look at the challenge of reconciling data from 7 distinct disciplines which address sub-sets of this challenge: detailed review of the extant literature led to the design of a **Retroductive** research strategy which enabled a quantitative examination of the 'best' units of analysis followed by the measurement and analysis of 170+ variables.

In **Part 2**, we defined a more precise way of defining maturity based on defining the Commercialisation Readiness Level (CRL) and compared this with the more commonly used Technology Readiness Level (TRL), to show how CRL provides a better assessment of growth.

In **Part 3**, we explore how 12 meso-economic Vectors (or 'levers' governing growth) can be used to describe the key components of growth.

In **Part 4**, we combine the maturity mapping based on CRL with the meso-economic Vectors in order to describe the Commercialism Journey.

In **Part 5**, we 'animate' the meso-economic Vector model to understand and model how 'ideological orientation' can shape the relative importance and impact of the different vectors, in particular how we can use it to tackle the UN's Sustainable Development Goals.

2. Introduction

Investment in research and development globally is predicated on the premise that science and technology-enabled innovations hold the key to growth, but the process of translating ideas into value and impact is not well-understood. Mazzucato & Jacobs¹ identify three broad components of this translation challenge:

- We need a *richer characterisation of markets and businesses* within them: rather than resorting to simplistic notions of market failure, we need to understand the outcome of interactions between the wide range of existing, new, and emerging actors, ownership structures, and regulatory environments
- We need a more *dynamic and accurate understanding* of how innovation is actually *translated* into impact, which builds on Schumpeter's² original analysis: we need to understand the meso-economics of growth, which drives non-equilibrium growth
- We need to recognise the *critical role of the public sector in the innovation process*: creation of economic value is a collective process, as lucidly described by Keynes³

Our research programme, started in 2010, is designed to explore how science and technology-enabled innovation is actually commercialised. The key results from this research so far can be summarised as follows:

3. Review of the Multi-disciplinary Literature

- Our survey covered seven research genres: entrepreneurship; technology management; funding and investment; 'conventional' business school literature largely based on case studies; practitioner-based approaches based on tools and methods; specialist literature which addresses talent, leadership, and culture; and research on customers, marketing & distribution

- Differences in perspective between the seven genres highlight the challenges in understanding commercialisation
- Our analysis concluded that we need a way of integrating insights from different disciplines into a coherent narrative under-pinned by empirical data.

4. Retroductive Research Methodology

Tackling this complex challenge requires an *integrative* approach to the research strategy and precise definition of the research questions we are trying to answer. The philosophical approach used is *retroductive*: the process starts with qualitative research based on questionnaires and interviews and ends up in quantitative mode, with clear definition of the start and end points relative to the lifetime of any concept.

5. Units of Analysis and Growth Metrics

- Our research showed the need to reconcile three different *units of analysis* which are used by different research disciplines: *idea, product, and company*.
- We use the term *company*, rather than *firm* to encapsulate a wide range of organisations, from traditional companies to ‘not-for-profit’ companies.
- Our new approach is based on **product as the primary unit of analysis**, treating *idea* as a product pre-cursor and aggregating products into a *product portfolio* to address the company level
- The approach is based on measuring **170+ variables**, derived from the literature search and innovation round tables with stakeholders
- The problem of heterogeneous metrics for these different growth variables is tackled by postulating a ***new performative metric which defines commercialisation intensity***
- The dynamics of the growth metrics are clarified by understanding the difference between ‘point’ data, ‘low frequency’ data where sampling can only occur from time and time, and ‘high-frequency’ data where it is possible to continuously track a variable.

6. Defining Growth Metrics

- The research literature describes many different measures of growth, including revenues, number of employees, company valuation, and funds raised, which sadly do not always provide consistent measures of growth
- Our research confirmed that cumulative *customer* growth is the ‘best’ measure of growth
- The empirical data on cumulative customer growth confirms that innovation-enabled growth can be described by the ***diffusion*** equation, consistent with previous research literature
- However, our research shows that previous work *over-estimates* growth at the earlier stages, and there is no reliable evidence to support the 5 customer types defined in this literature
- Instead, our research confirms that product growth is characterized by only 3 customer types: proto-customers, charter customers, and mainstream customers. We use this data to formulate the new ***Triple Chasm Model*** for growth

- We then use this model to define a more precise way of measuring maturity based on **Commercialisation Readiness Level (CRL)**
- We compare this new measure with the more commonly used Technology Readiness Level (TRL) to show how CRL provides a better measure of growth than the several different versions of TRL based on the NASA approach initially developed for space missions

7. **Meso-economic Vectors provide a more precise way of describing growth**

- Most research literature focuses on small 'sub-sets' of the variables which govern growth, only providing a partial picture of the key growth drivers
- We use empirical data on the 170+ growth variables to develop a **comprehensive** meso-economic Vector approach which allows us to define and understand all the driving forces which shape growth
- This approach builds on Schumpeter's seminal work on the micro-meso-macro continuum
- The key steps in our methodology are based on defining the **relevance** of each of these variables; we then cluster the variables into a smaller set of 'vectors' and sub-vectors' using k-means clustering techniques 'guided' by the qualitative insights gained in the literature search
- Using this approach allows us to define 12 new meso-economic vectors (with sub-vectors):
 - 4 External Vectors: Market Spaces; Proposition Framing, Competition & Regulation; Customer Typology; Distribution, Marketing & Sales
 - 6 Internal Vectors: Contingent Technology Development; Intellectual Property Management; Product & Service Definition; Manufacturing & Deployment; Human Capital; Funding & Investment
 - 2 Composite (or Trade-off) Vectors: Strategic Positioning; Business Models
- We then define a new measure describing the relative strength of each vector (and its constituents) and its execution, which we describe as the **Commercialisation Intensity** (Relevance X Execution), which allows us to compare variables which are typically measured using different metrics and scales
- This allows us to explore patterns for how the meso-economic vectors change over time for any idea/product/company, and also to explore differences in the relative importance of different growth drivers as shown in Figure 1 below
- Understanding these differences provides a new way of looking at strategic priorities which is superior to other historic approaches.

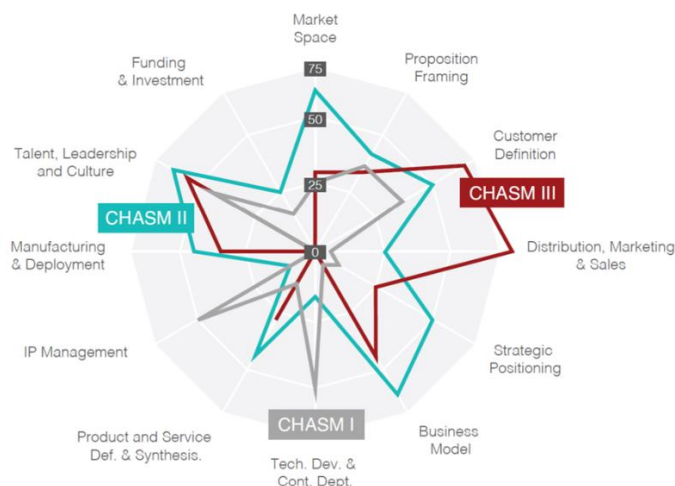


Figure 1. Variation in the 12 meso-economic vectors with maturity

8. Mapping the Commercialisation Journey

- We combine the maturity mapping based on CRL with the meso-economic Vectors in order to describe the Commercialism Journey for any product
- We develop an approach to understand and quantify changes in the commercialisation trajectory based on defining the ‘current’ diagnostic, the strategic target, the gap, and the execution plan
- We then develop mapping and profiling tools which look at the variation with maturity of individual products and product portfolios.

9. Ideological Orientation and Sustainability Stance

- We develop a new systematic approach to understanding sustainable growth based on the Triple Chasm Approach
- We ‘animate’ the meso-economic Vector model to understand and model how ‘**ideological orientation**’ based on macro-economic priorities can shape the relative importance and impact of the different vectors
- We then look at a special case of ideological orientation, which we define as **Sustainability Stance**, based on the UN’s Sustainable Development Goals, and how this relates to the current interest in tackling the ESG (Environmental, Social and Governance) challenges perceived by investors.

10. References

1. Mazzucato, M & Jacobs, M. (Eds), Rethinking Capitalism: Economics and Policy for Sustainable and Inclusive Growth, Wiley Blackwell, 2016
2. Schumpeter, J.A., Capitalism, Socialism and Democracy, Harper, 1947 (reprinted 2008)
3. Keynes, J.M., The General Theory of Employment, Interest and Money. Macmillan, 1936 (reprinted 2007)