

Innovation Management in Times of Crisis: Using Patent Analytics to Make Data-Driven Decisions

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June 30, 2021

Today's Speakers



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Guderian**
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University Erlangen-
Nuremberg

Agenda

- Welcome Greetings
- Common Innovation Management Responses to Crises
- Our Approach: Reliance on Patent Data to Cope with Crises
 - Managing Budget Constraints
 - Competitive and Technology Intelligence
 - Analyses May 2020 vs. June 2021 – Additional Insights?
- Q&A Session

Introduction

Crises like the Covid-19 pandemic affect firms' innovation management and decision-making
(Paunov, 2012; Tietze et al., 2020)



Crises as opportunities
→ some firms excel exploiting changing market requirements/necessities
(Archibugi et al., 2013, Hoegl et al., 2008)



Crises lead to detriments like budget constraints
→ some firms' responses: reduce innovation activities
(Davis et al., 2009; Martin-Rios & Pasamar, 2018)



Decision-makers must react quickly but often rely on ad-hoc decisions or even gut feeling
(Bessant et al., 2015; Cooper et al., 2010; Müller, 1985; Teece et al., 2016)

Introduction

Research Question

Can innovation management decisions in times of crisis like the Covid-19 pandemic be improved through publicly available data?

Potential Solution



Turn to patent analytics to rely on data and detect how patent analytics may shape innovation management during crises
(e.g., Archibugi et al., 2013; Campbell, 1983; Guderian, 2019)

Theoretical Background – Innovation Management in Crises

Crises influence innovation management with up- and downsides

(Antonioli/Montresor, 2019; Döner, 2017; Teplykh, 2018)

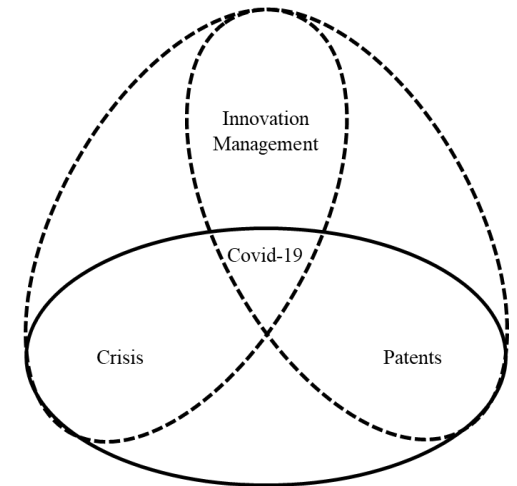
1) Crises intensify “uncertainty, complexity, ambiguity and unpredictability”
(Davis et al., 2009; Martin-Rios/Pasamar, 2018; Teplykh, 2018)

2) Innovation activities actually/de-facto reduced
(Antonioli/Montresor, 2019; Disoska et al., 2020; Döner, 2017; Ferreira/Teixeira, 2016)

1) Firms adapting to shifting market requirements and meeting new crises-induced necessities emerge stronger (Archibugi et al., 2013; Mayr et al., 2017)

2) Innovation as path out of crisis-induced valuation uncertainty, yielding a survival premium (Nemlioglu/Mallick, 2020; Cefis et al., 2020)

3) Radical change favorable for corporate management than cutting cost
(Heyden et al., 2020)



Theoretical Background – Innovation Management and Patent Analytics

Relationship: innovation management and patent analytics (Candelin-Palmqvist et al., 2012; Holgersson, 2013)

Firms often rely on intellectual property to appropriate returns

→ particularly prevalent in pharmaceuticals

(Bican et al., 2017; Conley et al., 2013; Di Minin/Faems, 2013; Greenhalgh et al., 2001; Somaya, 2012)

Patents:

(1) publicly available,

(2) serve as objective data sources on firms' innovation activities,

(3) offer unique insights in technology and business activities not assessable by external parties otherwise

(Ashton/Sen, 1988; Buehler et al., 2017; Ernst, 2003; Guderian, 2019)

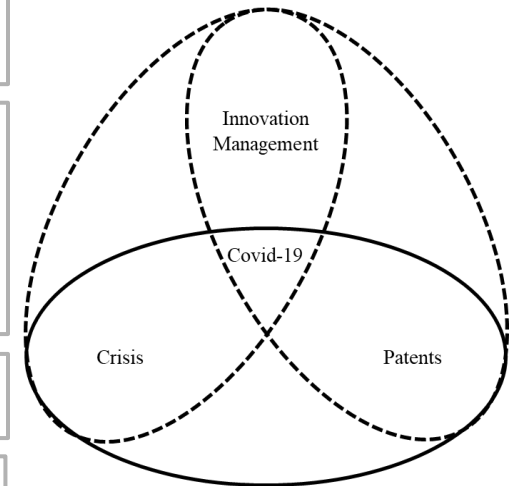
Patent analytics used to measure R&D or innovation activities' impact

(Ernst/Omland, 2011; Hall et al., 2005; Pavitt, 1985)

Use of patent value indicators

→ skewness of patent values and commercial applicability

(Buehler et al., 2017; Gambardella et al., 2008; Guderian, 2019; Fankhauser et al. 2018; Webster/Jensen, 2011)



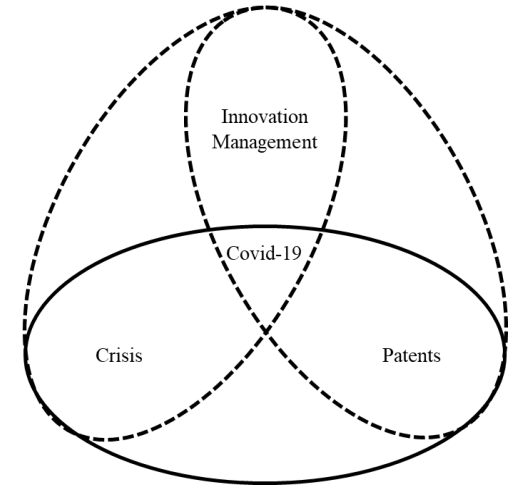
Theoretical Background – Patent Analytics in Crises: The Covid-19 Pandemic

Maintaining existing or filing new patents is challenging when budgets are constrained as in crisis situations

(Archibugi et al., 2013; De Rassenfosse/Van Pottelsberghe de la Potterie, 2013; Hud/Hussinger, 2015)

Tradeoff between cost-reduction vs. ensuring continued protection of relevant innovations

(Harhoff et al., 2009; Helfgott, 1993)



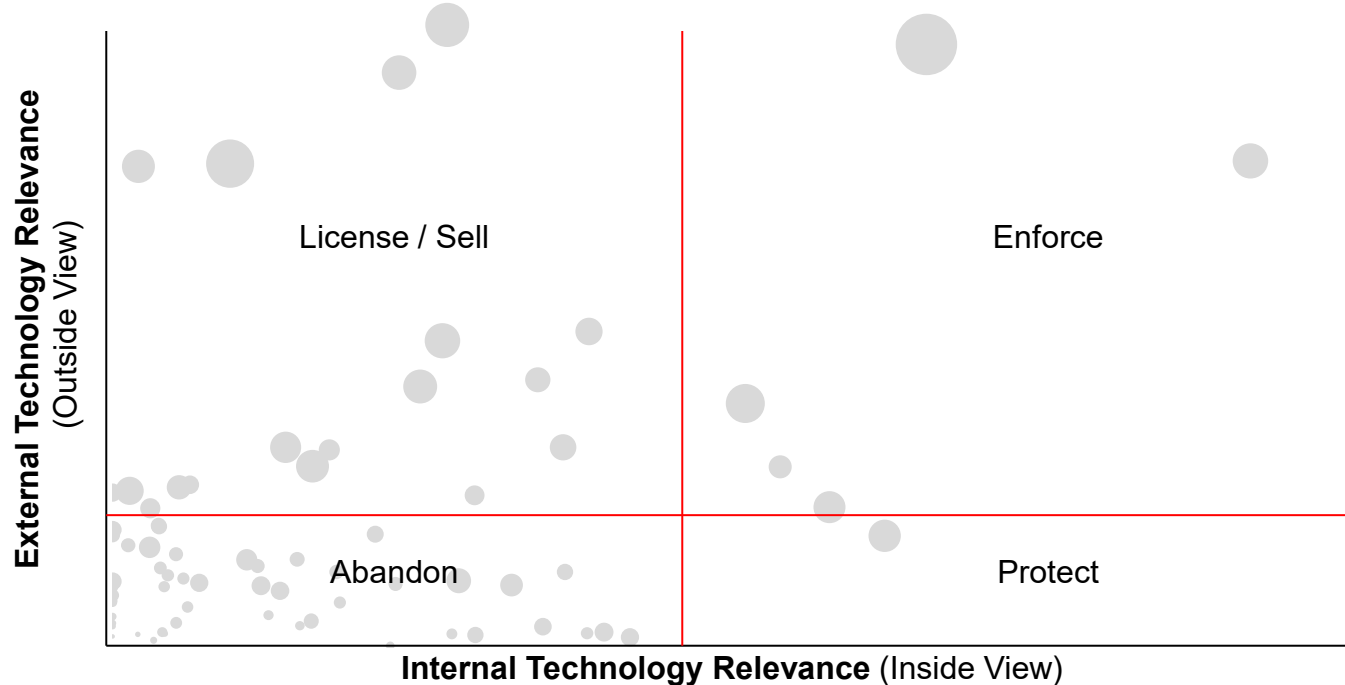
Prior Literature

Only few early attempts to link propositions to overcome the crisis and intellectual property

(Machuca-Martinez et al., 2020; Tietze et al., 2020)

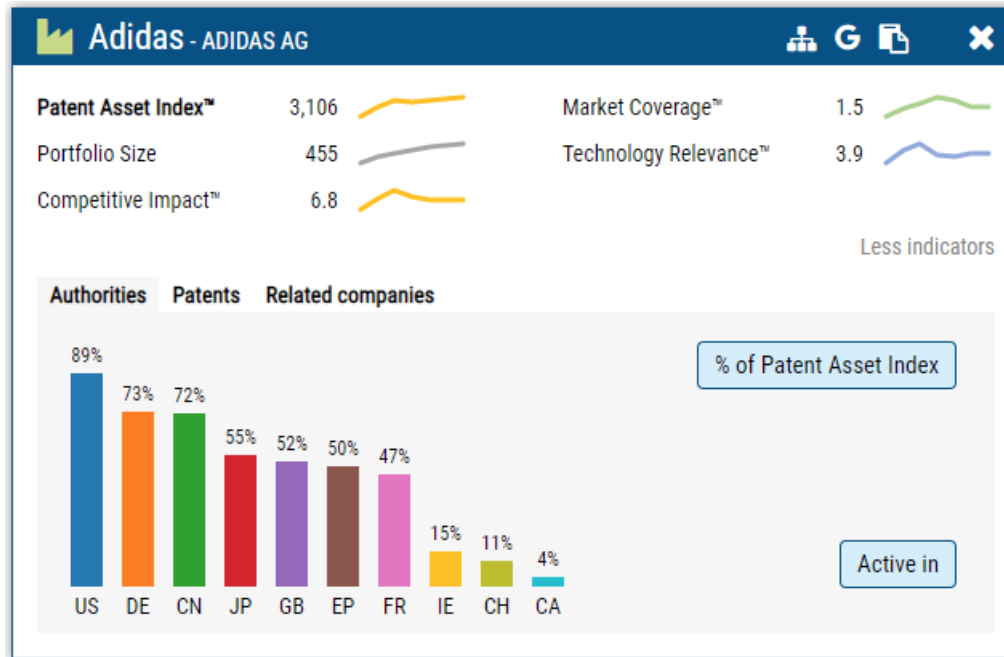
Managing Budget Constraints

Crises Responses: Identification of Abandonment and Licensing/Sales Candidates



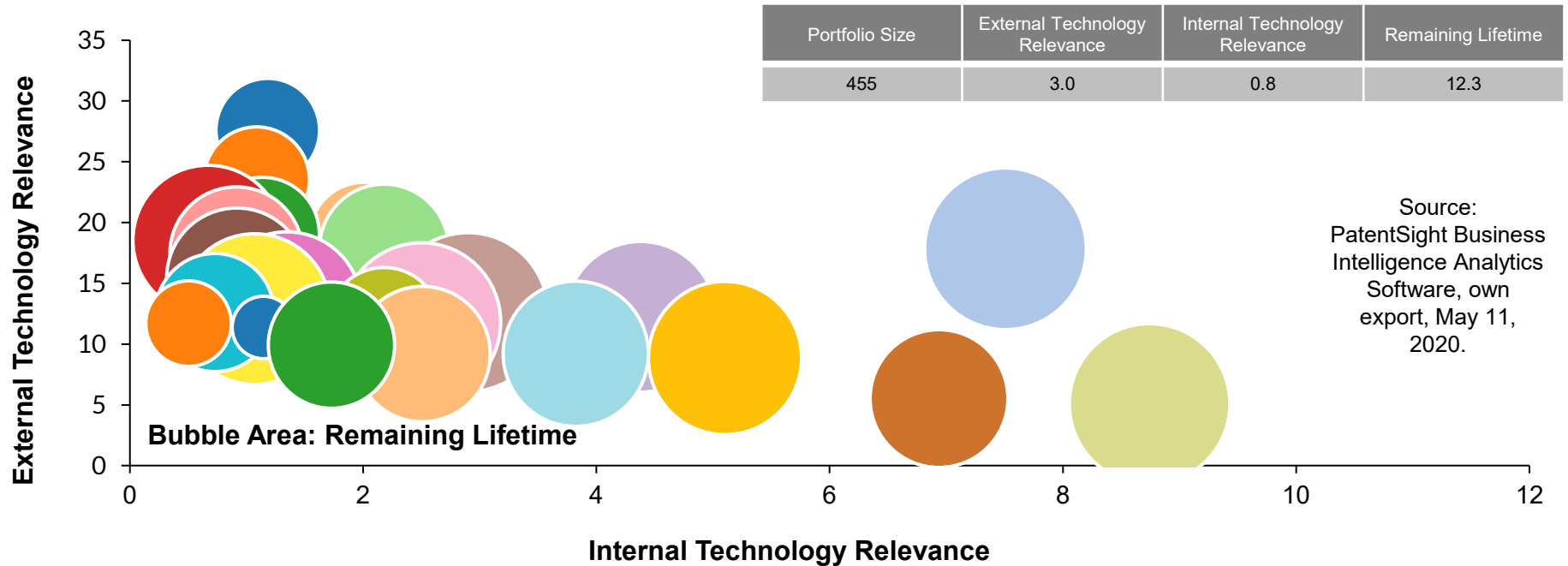
Managing Budget Constraints

Adidas AG's Patent Portfolio



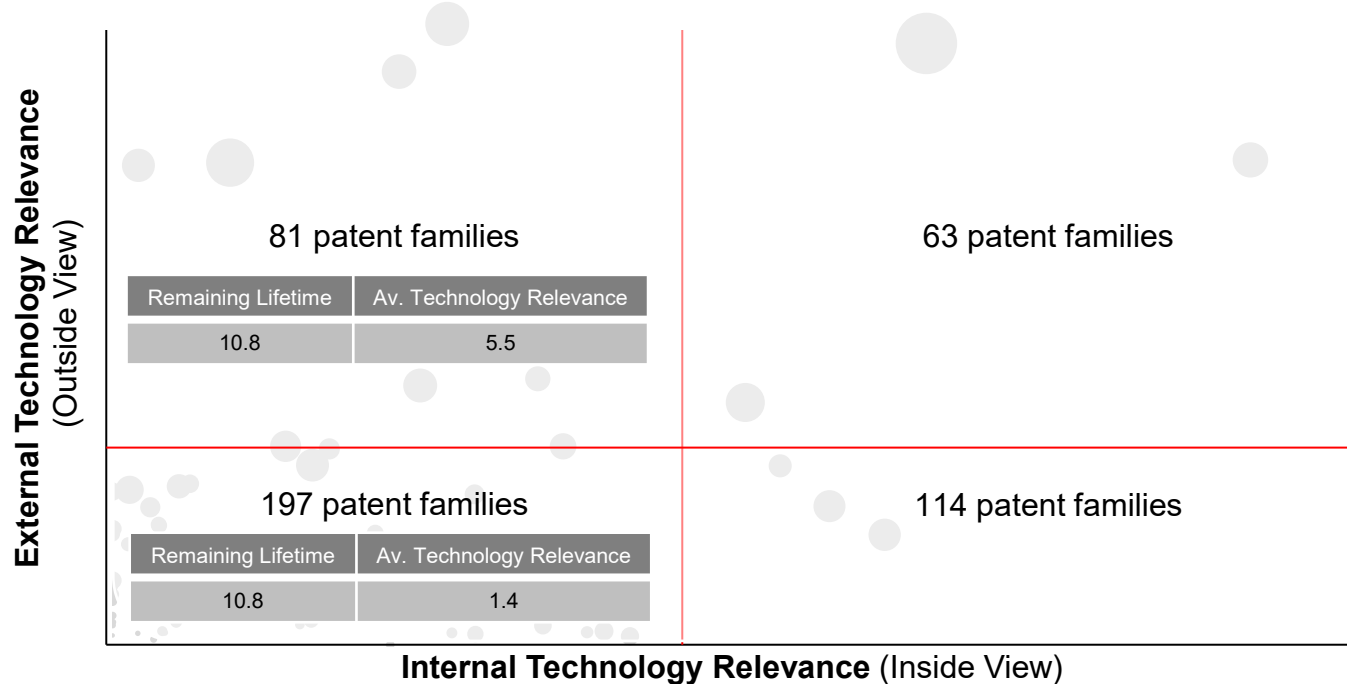
Managing Budget Constraints

Adidas AG's Patent Portfolio: Internal- vs. External Technology Relevance



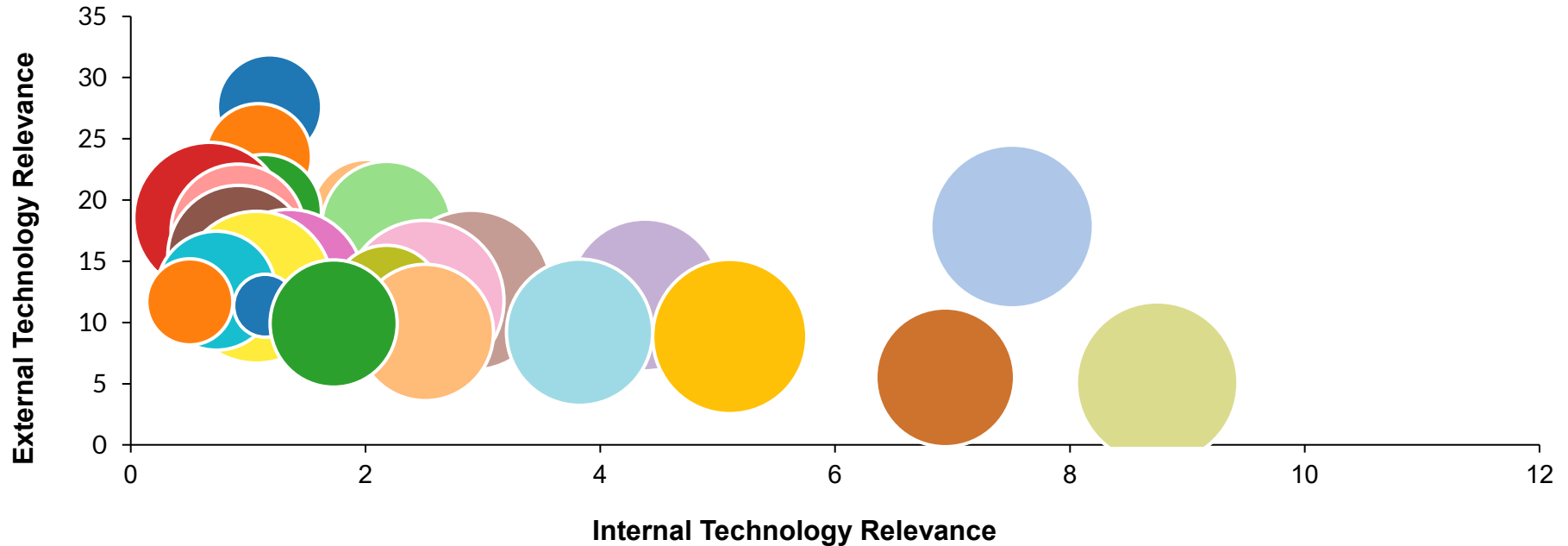
Managing Budget Constraints

Adidas AG: Identification of Abandonment and Licensing/Sales Candidates



Managing Budget Constraints

Adidas AG: Identification of Abandonment and Licensing/Sales Candidates



Managing Budget Constraints

Adidas AG: Identification of Abandonment and Licensing/Sales Candidates

Other Identification Options

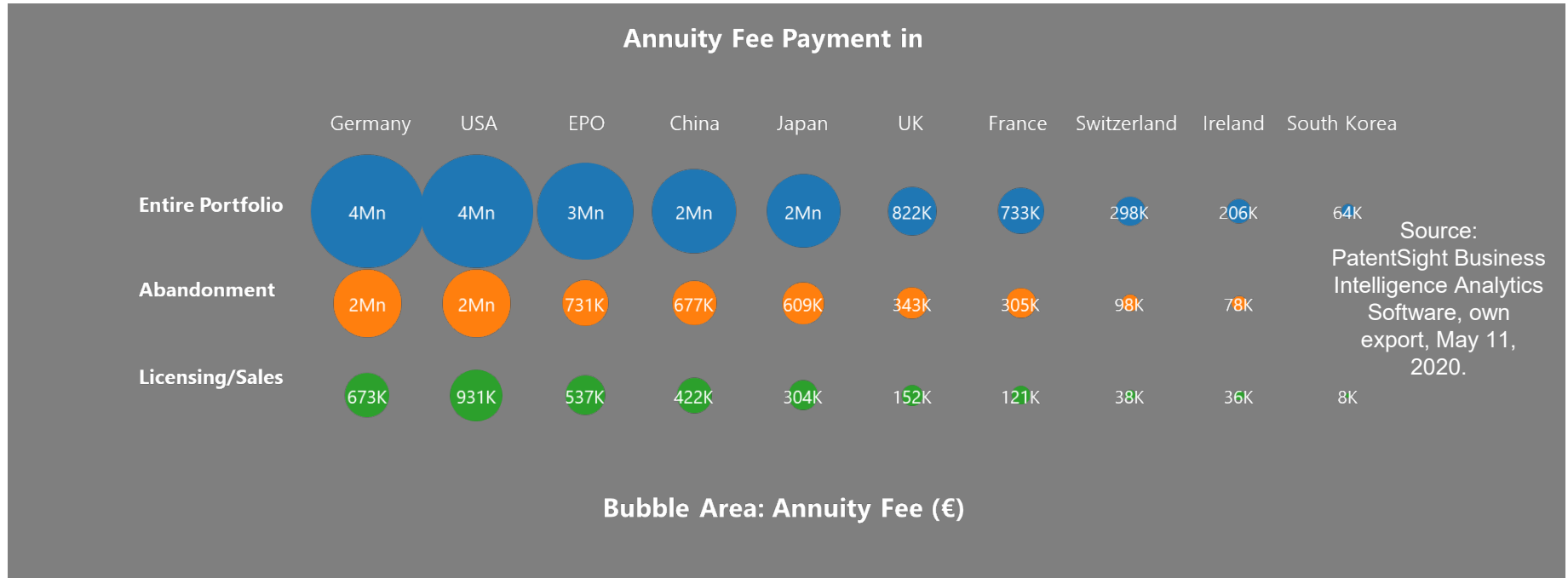
- Citations
 - None (after certain time period)
 - Below average
 - Below certain value
- Litigation (attacked, opposition, etc.)
- Sales/Revenues in certain authorities
- Less important technology classes
- ...

Watch out for...

- Citations by certain firms
 - Assignees
 - Patent-to-product links
 - Niche technologies
 - Organizational learning/path dependency
 - ...
- Beware!
- Not all patents can be dropped/licensed/sold
 - Cannot drop technology fields, only patent documents

Managing Budget Constraints

Adidas AG's Annuity Fees: Payment in USD at Various Patent Offices



Patent analytics in Crisis Response:

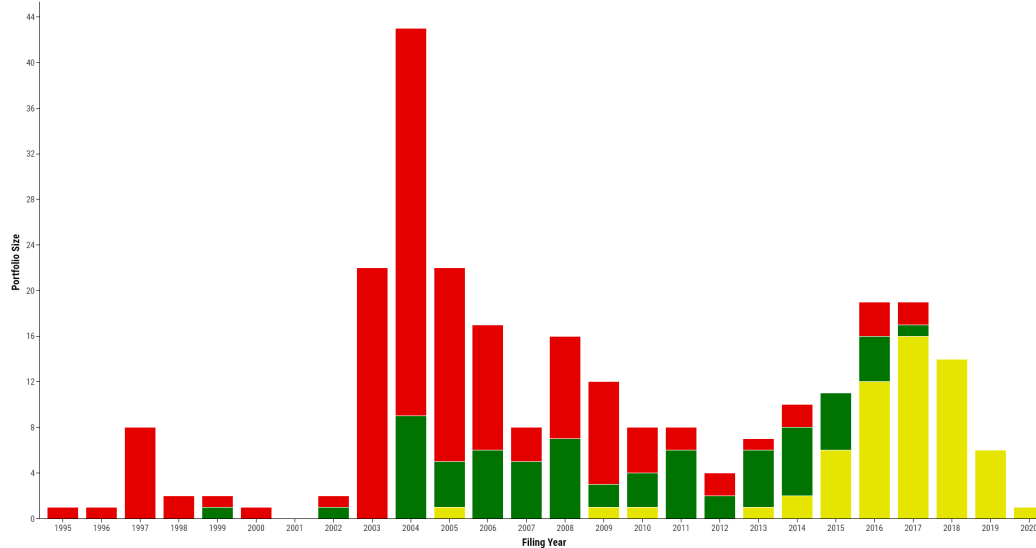
Example: Covid-19 Treatment and Vaccination – Competitive Landscape (focused approach)

- **Target: Retrieve entities that already possess the know how**
 - Keywords specific to *Coronaviridae* family searched for in Title and/or Abstract in combination with related IPC/CPC classes.
 - The focus: NOT all-encompassing conventional patent search but search for key patents.
 - Hypothesis:
 - The key patent owning entities have the know how that can contribute to the fight against the virus.
 - These key players can themselves contribute in developing vaccines and treatment against the virus

Results

Example: Covid-19 Treatment and Vaccination – Competitive Landscape (focused approach)

Filing Activities and Patents' Legal Statuses



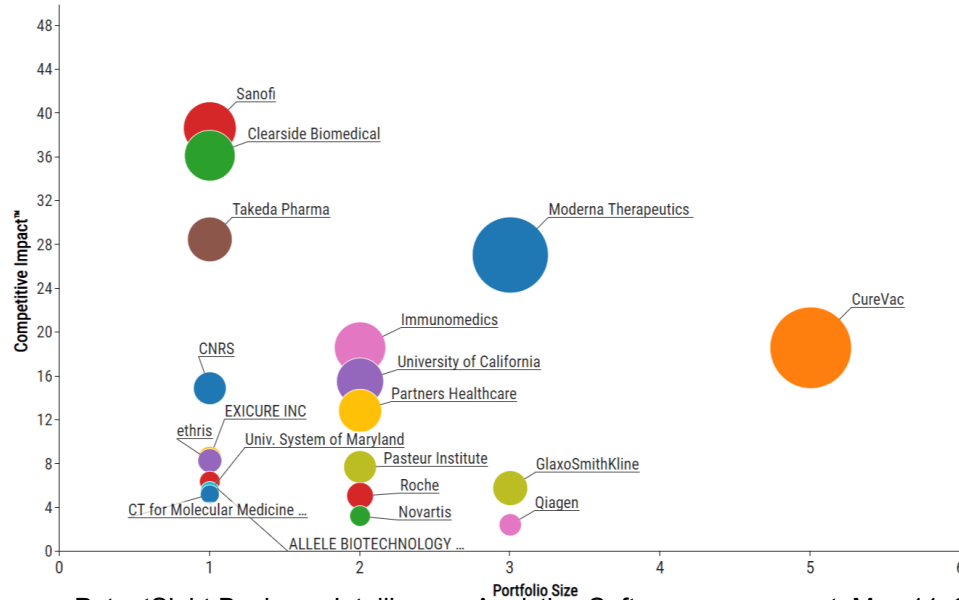
Source: PatentSight Business Intelligence Analytics Software, own export, May 11, 2020.

Results

Example: Covid-19 Treatment and Vaccination – Competitive Landscape (focused approach)

The top patent owning entities and the retrieved patents gave the following indications:

- The Spike protein of the virus has been researched upon to generate immunogenic response.
- The different vaccine techniques viz. adenovirus vector, conjugate vaccine, subunit vaccine as well as mRNA based vaccines have been researched upon against this virus family.



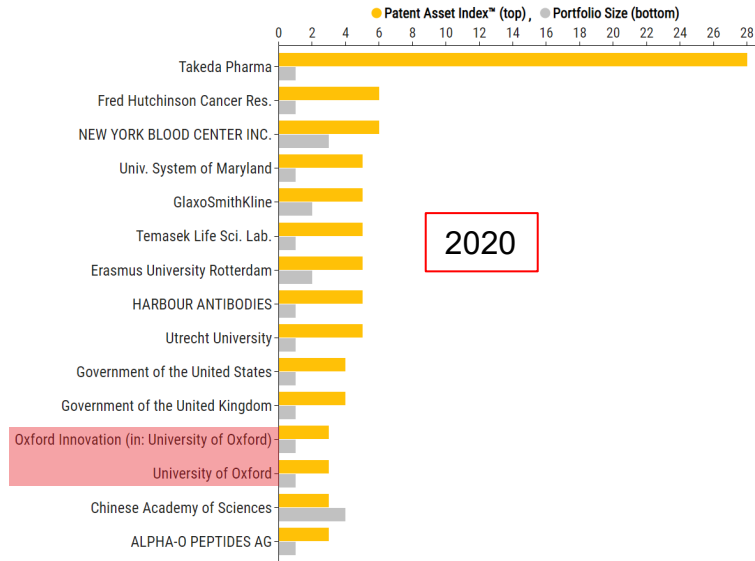
Source: PatentSight Business Intelligence Analytics Software, own export, May 11, 2020.

Results

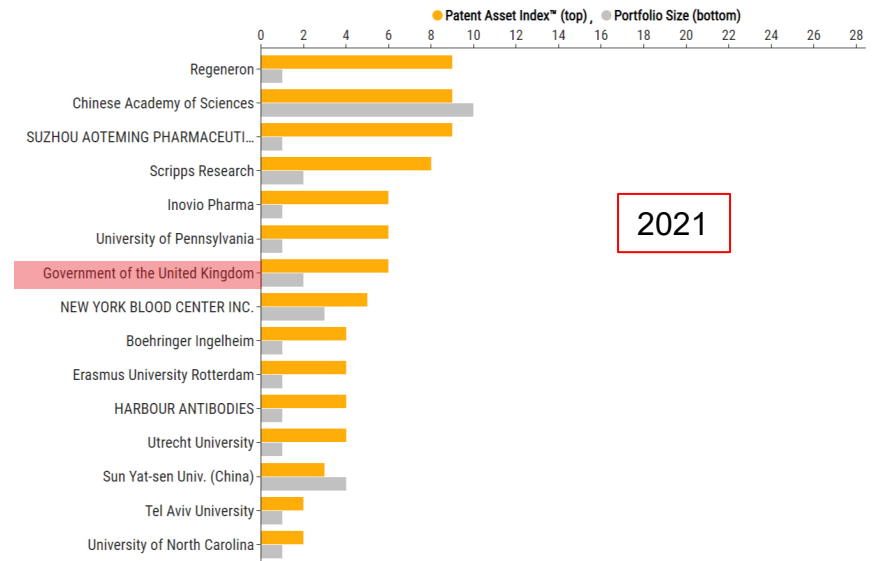
SarbanI to do

Example: Covid-19 Treatment and Vaccination – Spike protein based (focused approach)

Owners by Patent Asset Index



2020



2021

Source: PatentSight Business Intelligence Analytics Software, own export, May 11, 2020.

Oxford Innovation

Family of WO2018215766.A1 et al. Inactive

Compositions and methods for inducing an immune response

The invention relates to a composition comprising a viral vector, the viral vector comprising nucleic acid having a polynucleotide sequence encoding the spike protein from the middle eastern respiratory syndrome coronavirus (MERS-CoV), characterised in that said viral vector is an adenovirus based vector. Suitably said adenovirus based vector is ChAdOx 1, and said spike protein is full length spike protein. More suitably said spike protein is present as a fusion with the tissue plasminogen activator (tPA) sequence in the order N-terminus - tPA - spike protein - C-terminus. The invention also relates to uses and methods. (Source: WO2018215766.A1, original)

Inventors Gilbert Sarah C Hill Adrian V S Morris Susan Jane

Applicant Univ Oxford Innovation Ltd

Oxford Innovation (i...,

University of Oxford

First filing in family 5/23/2018

First publication in family 11/29/2018

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News

THE LANCET

ARTICLES | [VOLUME 397, ISSUE 10269, P99-111, JANUARY 09, 2021](#)

Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK

[Merryn Voysey, DPhil](#) * • [Sue Ann Costa Clemens, PhD](#) * • [Shabir A Madhi, PhD](#) * • [Lily Y Weckx, PhD](#) * •

[Pedro M Folegatti, MD](#) * • [Parvinder K Aley, PhD](#) • et al. [Show all authors](#) • [Show footnotes](#)

[Open Access](#) • Published: December 08, 2020 • DOI: [https://doi.org/10.1016/S0140-6736\(20\)32661-1](https://doi.org/10.1016/S0140-6736(20)32661-1) •



Oxford Innovation

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Applicant Univ Oxford Innovation Ltd

Oxford Innovation (i...)
University of Oxford

First filing in family 5/23/2018
First publication in family 11/29/2018

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Legal events for family WO2018215766.A1

All DE EP GB

▼

Inflection	Office	Event type	Description	Effective d...	Further ...	Bulletin	Applies to
-	EP	PCT entering nat. phase	EP: PCT APPLICATION NON-ENTRY IN EUROPEAN PHAS...	8/12/2020	Corr do...	8/12/2020	WO2018215766.A1
	DE	PCT entering nat. phase	NON-ENTRY INTO THE NATIONAL PHASE (NENP DE)	11/27/2019		11/27/2019	WO2018215766.A1
	EP	PCT entering nat. phase	EP: THE EPO HAS BEEN INFORMED BY WIPO THAT EP W...	1/9/2019	Corr do...	1/9/2019	WO2018215766.A1
-	GB	Withdrawal, Refusal, Ab...	APPLICATIONS TERMINATED BEFORE PUBLICATION UN...	11/21/2018		11/21/2018	GB201708444.D0

Oxford Innovation

Family of EP2714916.A1 et al.
⏪ ⏩ ⚙️ in force

● Simian adenovirus and hybrid adenoviral vectors

The present invention provides recombinant adenoviral vectors, immunogenic compositions thereof and their use in medicine, and methods for generating recombinant adenoviral vectors. In particular, the present invention provides an adenovirus vector comprising a capsid derived from chimpanzee adenovirus AdY25, wherein said capsid encapsidates a nucleic acid molecule comprising an exogenous nucleotide sequence of interest. (Source: EP2714916.A1, equivalent)

Inventors Cottingham Matthew Guy, Dicks Matthew Douglas James, Gilbert Sarah, Hill Adrian...

Applicants Cottingham Matthew Guy, Dicks Matthew Douglas James, Gilbert Sarah, Hill Adrian, ...

University of Oxford, ...

First filing in family 5/25/2012

First publication in family 12/20/2012

No drawing available.

More

Indicators	Table...	Legal status today	Legal events...
Competitive Impact™ (CI)	10.8	In force	AU, BE, CH, CN, DE, DK, ES, FR, GB, IE, IT, JP, NL, NO, SE, US, ZA
Market Coverage™ (MC)	3.0	Nationalized	EP
Technology Relevance™ (TR)	3.6	Pending	-
		Inactive	AL, AT, BG, BR, CA, CY, CZ, EE, FI, GR, HR, HU, IS, LT, LU, LV, MG, MK, MT, PL, PT, RO, RS, RU, SG, SI, SK, SM, TR, WO

Discussion

Theoretical and Practical Implications

Key Contribution: Establish relation between crises and patents, thus transforming two established dyadic relations from prior research into triadic relation between innovation management, crises, and patents.

Patent-based information allows to derive and implement data-based strategic decisions in crises like the current Covid-19 pandemic, thus forfeiting ad hoc and gut feeling-based decisions

Address firms' internal and external spheres

Patent analytics may support innovation managers in realizing cost-savings, finding minimum prices or royalty payments that need to be achieved in sale/licensing negotiations, detect technological and strategic fit between business strategies/innovation capabilities/patent portfolios, and reveal data-driven predictions for firms likely to succeed in developing treatments and vaccinations to Covid-19

Discussion

Limitations and Further Research

Covid-19 pandemic is ongoing → results as preliminary assessments

Complement patent data with corporate data or actual decision-making schemes from corporate representatives to identify firms' internal reasonings

Study additional insights into shifts from quantity- to quality- or value-driven patent management based on actual patents sold, licensed in or out, or abandoned

Future research: move from qualitative towards empirical analyses to study actual performance effects of patent data-driven decisions in crises situations and expand longitudinal considerations

THANK YOU

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Resources

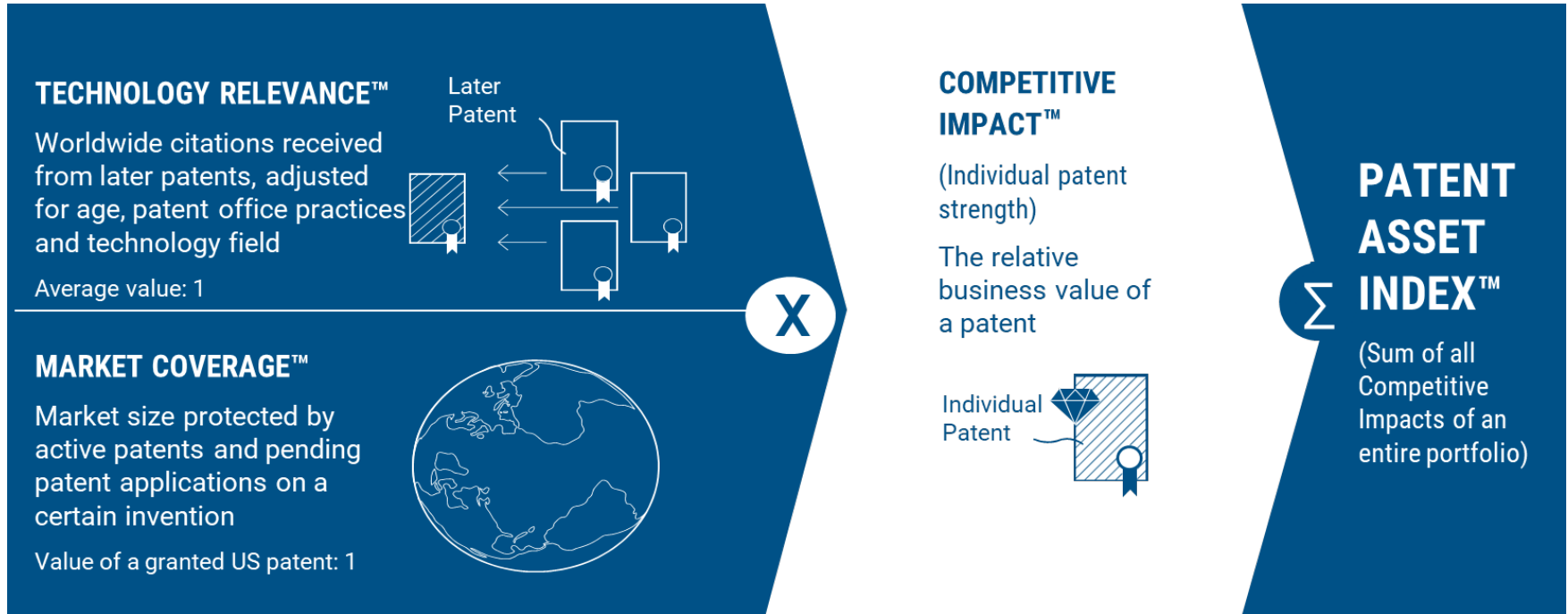
Publications:

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- Ernst, H., Omland, N. (2011). The Patent Asset Index – A new approach to benchmark patent portfolios. *World Patent Information*, 33(1), 34-41.
- Guderian, C.C. (2019). Identifying Emerging Technologies with Smart Patent Indicators: The Example of Smart Houses. *International Journal of Innovation and Technology Management*, 16(2), 1950040.
- Guderian, C.C., Bican, P.M., Riar, F.J., Chattopadhyay, S. (2020). Innovation management in crisis: patent analytics as a response to the COVID-19 pandemic. *R&D Management*, 51(2), 223-239.

Blog Entry:

- <https://www.lexisnexisip.com/knowledge-center/innovation-management-in-times-of-crisis-budgets-acquisitions-or-alternative-options-insights-from-patent-analytics/>

Patent Asset Index™



Ernst, H., Omland, N. (2011). The Patent Asset Index – A New Approach to Benchmark Patent Portfolios. World Patent Information 33(1), 34–41.