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RESEARCH STATEMENT

My research is unified by a singular focus: an in-depth, quantitative exploration of the association between process innovation and economic performance. Despite its perceived benefits to a firm's economic performance, process innovation has received substantially less attention than product innovation in past research.

My overarching research topic is motivated from my extensive professional background in the pharmaceutical industry and underlines my research philosophy: strive to identify research questions that are not only challenging from an academic point of view but also have clear potential to impact practice. My dissertation is based on a key observation I made during my years of full-time professional work: for a pharmaceutical firm, it is not only important to develop *new* drugs but also have the capabilities to optimize how to process *existing* drugs. Below I describe the specific research questions that I have explored and discuss the potential practical implications that arise from my work.

For my job – market paper, which is under review at *Manufacturing & Services Operations Management*, I have studied a central issue in the innovation and operations literatures: How does a firm's process-innovation portfolio relate to that firm's economic performance? I choose the pharmaceutical industry as the context for this work and focus on drugs that are open to competition from generics. These provide an ideal setting for the study of process innovation because this type of innovation provides one of the principal ways through which pharmaceutical firms can compete in this context.

The study, which I co-author with Professor Dimitris Andritsos (HEC Paris) and Professor Claire Senot (Tulane University) uniquely conducts a multi-dimensional evaluation of a firm's portfolio of process innovations at the product level. Through a collaboration with expert patent attorneys, we developed a unique longitudinal dataset to enable this research, combining secondary data and evaluations of a firm's portfolio of process patents along three key dimensions: novelty, scope, and locus of application. This approach allows a quantitative evaluation of both the relative benefit of the different dimensions of a process-patent portfolio as well as the potential complementarities between them. Econometric analyses are conducted for a large-scale sample of anti-cancer drugs.

We find a positive association between overall process innovation and firm performance. When differentiating between dimensions of process innovation, our results further suggest that high novelty is beneficial, and complemented by a broad scope, but only for process innovation applying to the later phase of the pharmaceutical manufacturing process. The results provide important practical insights that can inform process-related R&D investments in the pharmaceutical sector.

The unique dataset that we developed for this first study provides the basis for structuring the remainder of my dissertation. It combines primary and secondary data sources from four countries: the United States, France, Spain, and Italy. For each of the 50 drugs included in our final sample, we collect all firm quarterly sales observed in each of the four countries considered, as well as all related process patents, over a ten-year period. The resulting final dataset includes observations that relate to 675 unique pharmaceuticals (original and generic versions) produced by 206 firms that own a total of 228 individual process patents (which can be further grouped into 216 unique portfolios).

In my second paper, I attempt to understand in depth what allows firms to be more process innovative. In particular, I address the following research questions: 1) How do firms' technological capabilities (e.g., in-house manufacturing, technological diversity, product portfolio etc.) impact their ability to develop process innovations? 2) How do market characteristics such as market size and degree of competition moderate these effects? Our results so far indicate that in-house manufacturing capabilities positively impact a firm's ability to process innovate and this ability is moderated by the size of the market. In my third paper, currently in progress, I examine the longevity of the benefits that process innovation produces. The article delves into my dataset to assess and quantify the economic impact of changes in a firm's product-level portfolio of process innovations. For example, how long do economic benefits from the addition of a new patented process innovation to a firm's portfolio persist over time? Conversely, how detrimental is the expiration of a firm's patented process innovation?

In the near term, I plan to continue my research in the area of pharmaceutical process innovation. However, I have already started exploring alternative research directions. For example, I have already begun working with Professor Jürgen Mihm (INSEAD) on a project that aims to measure the effect of the design and timing of procurement auctions through the study of purchasing practices of German health-insurance companies.

As I progress in my academic career I plan to maintain and interact with my established network of industry specialists. As it has done until now, this network will continue to enable me to identify relevant research questions and publicly unavailable data sources, confirm the credibility of my hypotheses, discuss the practical validity of my empirical results and allow me to quickly get advice in a way that would be valuable for any academic.