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Supervisor Expression of Interest
MSCA - Marie Sklodowska Curie Action - (PF) Postdoctoral Fellowship 2023

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Link "Pagina docente":
https://www4.ceda.polimi.it/manifesti/manifesti/controller/ricerche/RicercaPerDocentiPublic.do?EVN_DIDATTICA=evento&k_doc=268553&lang=EN&aa=2022&tab_ricerca=1
Department Name:
The Department of Management, Economics and Industrial Engineering (DIG)

Research topic:
MSCA-PF Research Area Panels:

- X ECO_Economic Sciences
- ☐ ENG_Information Science and Engineering
- ☐ ENV_Environmental and Geosciences
- ☐ LIF_Life Sciences
- ☐ MAT_Mathematics
- ☐ PHY_Physics
- ☐ SOC_Social Sciences and Humanities
- ☐ CHE_Chemistry

Brief description of the Department and Research Group (including URL if applicable):

The Department of Management, Economics, and Industrial Engineering (DIG) of Politecnico di Milano was established in 1990. Its mission is to have a positive impact on society by creating and sharing knowledge at the crossroads between engineering, management, and economics. To this end, it engages in outstanding research, high quality education, and service to the community. Specifically, DIG pursues scientific excellence by adopting a tailored approach which relies on multi-disciplinarity, diverse methodologies, and intense connections with practitioners and policymakers. With approximately 140 professors, DIG is one of the largest departments of Politecnico di Milano.
More information can be found at: https://www.som.polimi.it/en/

DIG HumanTech program has been selected and funded by the Ministry of University and Research (MUR) for the period 2023-2027 within "Dipartimenti di Eccellenza" (Law 232/2016), the ministerial initiative aimed at rewarding the departments that stand out for the quality of their research and at financing specific development projects.

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In particular, the objective of HumanTech is to redefine the relationship between technology and human beings so as to enable a sustainable digital transition of industrial systems. The project aims to propose new models and processes for the development and adoption of technologies, capable of accelerating the transition towards sustainable, inclusive industrial systems that make individual and collective well-being a priority.

"MInDSET" Research Group: the group is interdisciplinary, representing a range of economic specialties (including microeconomics, macroeconomics, monetary policy, international economics, international business, industrial economics, innovation, institutions, development, sustainability, econometrics, entrepreneurship, trade), and share a common perspective in both the framing of economics-related problems and the analysis of economics-driven phenomena with the ultimate aim to draw implications for the economic social welfare. Its members address the issues related to the globalization of economies and firms, the functioning of institutions, industries and markets and their impact on the society, the role of public policies in the economy.
URL: https://www.mindset.polimi.it/

TITLE of the project:
A methodology to identify, deal and cope with resource scarcity and strategic dependencies of European Value Chains

Brief project description:
Both scientific literature and outlooks by Institutional agencies (European Commission, 2020; 2023) hint that the World Economy will likely face a serious issue of resource scarcity – particularly, critical raw materials (CRM) scarcity – over the next few years, which will pose challenges to value chains' fundamental role of ensuring continuous supply. The Covid-19 pandemic, as well as the recent geopolitical crisis, further exacerbated the VUCA (volatility, uncertainty, complexity, and ambiguity) business environment– in the form of substantial commodity price increase and shortages of critical supplies (e.g., semiconductors). With the aim to strengthen its economic competitiveness and secure its strategic autonomy, the EU has identified a list of industries that are key to these objectives, and it has started to delineate a strategy to ensure access to CRM, which are often essential to such industries. Yet it is still unclear (a) how National Governments, including the Italian one, should adopt and support these general guidelines; (b) which managerial strategies and practices, including circular economy-related practices, could be more effective in tackling the scarcity-driven issues and ensuring supply continuity; (c) how the European Union can be exemplary in the race to secure the supply of CRM without misconducting on ethical issues?

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Again this backdrop, the project will contribute to advance knowledge and scholarly management literature on scarcity-driven issues within value chains, by pursuing three main objectives.

1. it will develop an original methodology for the identification, among the strategic supply chains/industries, of the associated raw materials that are considered "critical" for a given country in a given period, as well as of other possible sources of criticalities/scarcity.
2. it will contribute to increase the awareness of firms, industrial associations and governments about the risks raised by CRM and other sources of scarcity in strategic supply chains, to support their decision-making process. On top of that, it will provide managerial and policy suggestions on how to enhance competitiveness and reduce external dependencies in one selected strategic product value chain (PVC) belonging to one of the industries listed as "strategic" by the EU.
3. it will contribute to foster the sustainability of the production ecosystems of each value chain activity, by analysing how the shift towards the circular economy paradigm allows not only to decrease the dependency of the strategic supply chain from critical raw materials, but also to improve the efficiency of the whole production system.

The project will investigate a specific PVC, selected through a methodology that relies on the combination of different layers of analysis based on the identification of the sourcing countries, company risks, technological evolutions, political trends and recyclability potential of the critical raw materials associated to a specific supply chain/industry. The empirical analysis will rely on Machine Learning, Big Data, content analysis, descriptive statistics, econometric analysis, value chain mapping, Delphi study, and case studies on the selected PVC. However, the final outcome of this project will be applicable also beyond the selected PVC. Indeed, the integrated methodology developed within the project will be replicable in other strategic industries with reference to other CRM, and will allow providing managerial practices and advising to policy-makers on how to mitigate scarcity-driven issues and ensure the continuity of supply.