A Framework for Continuous Assessment of IT Value in Industry 4.0

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**Abstract** Assessment of the value of information technology (IT) is one of the most challenging priorities for modern organizations. The topic has been studied for decades but the continuous nature of digital transformation in industry (DTI) has added a new dimension to the problem. The paper presents a framework to capture IT value over time, supporting industries in (1) monitoring the outcomes of their digital transformation and (2) evaluating the need for new investments. The framework is inspired in the literature of IT value and extended to the dynamic, integrated and boundary spanning logic of Industry 4.0. The difficulty to prove the holistic value of IT investments is an obstacle to the necessary developments in industry. Moreover, similarly to DTI, IT value assessment ismultidimensional and should be the result of an ongoing evaluation supported by evidence.

**Keyword** IT value · Continuous assessment · Industry 4.0

**JEL Classification:** L1, L2, O3

1 Introduction

This paper identifies the mechanism generating *political budget cycles* (PBCs), a term used to refer to the jump of budget deficits during election years. Thisь phenomenon is generally interpreted as being triggered by the government’s pursuit of re-election, and it is played out when incumbents pursue opportunistic fiscal policies before general elections so as to appear competent and offer voters the illusion of economic prosperity (Rogoff, 1990; Rogoff & Sibert, 1988). Specifically, either because they are facing a myopic electorate with a *decaying memory* of past events or taking advantage of *informational asymmetries* that exist between them and rational constituents, politicians may choose to maximise their own *voting* *function* (Nordhaus, 1975) instead of behaving benevolently by maximising a social welfare function as is commonly assumed by traditional macroeconomic theory (Theil, 1956; Tinbergen, 1975).

There are effectively two possible mechanisms that could generate PBCs, either through excessive public spending or via taxation policies aiming at a suboptimal level of tax revenue (Alesina, 1987, 1988), each with very different social welfare implications. Our paper contributes to the literature by tracing the steps taken in order for PBCs to be created. PBCs on the revenue side take place mainly in the form of a direct and indirect tax rate reduction, whereas PBCs on the expenditure side materialise mostly through an increase in transfer payments. Hence, the former tends to be of practical concern to relatively wealthier and, therefore, less numerous potential voters. As a result, we argue that revenue-side PBCs seem less likely, and for the additional reason that they require a considerably more significant time lag between the reduction in tax rates and the corresponding reduction in tax revenue and timing is of critical importance in increasing the effectiveness of pre-electora fiscal manipulation.

The research assumptions were confirmed on the basis of the achieved results. The ICT sector is developing dynamically in the V4 countries, which is reflected in changes in the level of concentration and in the reduction of inequalities between different size categories of companies in the market. Changes in the economy associated with digitization and digital transformation, as well as lifestyle changes with the widespread use of electronic devices, play an important role in reducing inequalities in the ICT sector.

**2 Background**

***2.1 Industry 4.0***

Digital transformation in industry (DTI) is now a top priority for different zones of the globe [10, 22, 52]. It can be defined as the development of smart factories that provide smart services and smart products to satisfy the needs of each client [50]. Characterized by the extensive use of advanced resources of information and communication technologies, Industry 4.0 is also a social transformation process with major impacts in work practices [27].

Acknowledgements This contribution was undertaken as a part of the research project 1/0152/18 VEGA Business models and platforms in the digital environment.

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