ABSTRACT

Total factor productivity is enhanced by e-collaboration’s ability to spread technical change. Economic surplus analysis allows business executives and policy-makers to assess the value of technical change. It can also be extended to assess e-collaboration in order to rationally steer investment opportunities. It is imperative for business executives and policy-makers to empirically assess the impact of scientific knowledge facilitated by e-collaboration to efficiently allocate their resources.

Keywords: economic surplus; ex-ante benefit-cost analysis; e-collaboration; market structures; knowledge creation

INTRODUCTION

E-collaboration is broadly understood as collaboration among individuals engaged in the execution of common tasks, using certain electronic technologies. It refers to a range of technology-supported activities, using computer and non-computer-mediated communication elements (Kock, 2006). E-collaboration is important to the economy, as it speeds up knowledge transmission to profit as well as not-for-profit institutions. It allows households, businesses, and governments to efficiently implement joint tasks and bring seemingly unrelated functional areas closely together. The end results are better and faster decision-making processes among geographically dispersed individuals, who otherwise may not interact with each other.

E-collaboration presents several important implications at the time of creating goods and services, designing production methods, or conducting training programs across borders. For example, it helps to carry on business plans, improve customer service, redefine market segments, or reshape organizations, which translate into cost savings and/or output increases that spur global competition and raise standards of living. Sub-optimal levels of e-collaboration prevent households, businesses, and governments from timely adopting new technologies and enhance
competitive advantages. A global economy requires them to pursue an active process of technical change, allocate an adequate amount of resources on research, and design policies aimed at enhancing knowledge (Ortiz, 2006). E-collaboration serves as a tool to increase the efficiency with which production factors, such as capital and labor, are used on a wide range of disciplines, businesses, industries, and economic sectors.

Market considerations and collective action bias resource allocations on e-collaboration towards certain interest groups. Among the possible reasons that explain such a bias are market distortions and the opportunity costs to society in terms of maximizing marginal rates of return on e-collaboration. Knowledge generation throughout the economy is the result of research investments that have been nurtured and adopted for quite some time. Such a flow increases if e-collaboration takes place or decreases if knowledge is not adequately transferred to those special interest groups.

The dissemination of knowledge requires time from its inception to implementation. Shortening such a time economically justifies e-collaboration despite imperfect information and inadequate funding from the public and private sectors. In both cases, transaction costs increase and markets failures are incapable of signaling the public and private sectors to improve their knowledge generation capacity. E-collaboration acts as a palliative. It contributes to augment the diffusion of knowledge leading to productivity gains. However, e-collaboration competes with alternative traditional technology transfer activities for the same resources.

SEARCHING FOR A RATIONALE

E-collaboration uses powerful interactive tools in the form of text-based, voice-chats, or video images. It promotes access to information through e-mailing, video-conferencing, instant computer-to-computer messaging systems, or mobile telephony to streamline quality improvement activities (Kock, 2006). Technological breakthroughs leverage e-collaboration to serve as the asynchronous or synchronous networking tool that impacts performance among participating households, businesses, and governments. These entities increasingly look at e-collaboration as an alternative to face-to-face communication to brainstorm ideas for solving problems that are intrinsic to a fierce competition.

E-collaboration impacts the competitive dynamics of households, businesses, and governments in a different fashion depending on the industry or economic sector. Actually, it lowers transaction costs, especially among businesses in tasks as diverse as customer satisfaction, financial services, or product development. Regardless of the type of organization, the most visible benefit of e-collaboration is total factor productivity increases due to information gathering and time savings.

Attempts to measure the explicit contribution of e-collaboration to economic growth and efficiency are non-existent. There are inherent methodological difficulties at the time of factoring in quality improvements when measuring the impact of e-collaboration. Even those conducted for the e-economy are rather scanty despite a widespread recognition that it has made significant impacts in the broader economy. In 1999, a comprehensive study undertaken by Goldman Sachs to
measure the impact of the Internet on the US economy showed yearly increases in the gross domestic product of about 0.25 percent. Another study about the investments on information technologies at the US manufacturing level found cumulative returns of roughly seven percent over a 4.5 year period (McAfee, 2000).

A THEORETICAL FRAMEWORK
Measuring the intangible nature of e-collaboration among households, businesses, and governments requires: (i) identification of the e-collaboration options, (ii) definition of relevant e-collaboration alternatives, (iii) assessment of their effects in light of the tasks to be performed, and (iv) comparison of results and decision making. The concept of economic surplus stands out as an appropriate framework provided by economic theory to assess technical change due to e-collaboration. It basically consists of a partial equilibrium model to measure short and long-term variations in consumer and producer surpluses in a market of choice. Therefore, a partial equilibrium analysis neglects the effects on markets related to the good or service for which e-collaboration is being used. However, the magnitude of such an omission would be minimal—the lower the income effect associated with price changes and/or the expenditures’ share in the consumer’s budget (Ortiz, 2006).

The concept of economic surplus to assess ex-ante technologies being promoted through e-collaboration relies on a set of standard, well known, assumptions. These are: (i) the competitive demand price of e-collaboration reflects its value to a consumer, (ii) the competitive supply price of e-collaboration reflects its value to a producer, and (iii) individual costs and benefits of e-collaboration can unequivocally be aggregated. If the assumptions above are met, net benefits accrued to consumers can be measured by the area under their demand curve while net benefits accrued to producers can be measured by the area above their supply curve.

Three basic market representations illustrate overall welfare in an economy where households, businesses, and governments use e-collaboration to promote technical change. These representations are traditionally related to size: small or large economy; degree of openness: closed, net-importer, or net-exporter economy; and structure: purely competitive, monopoly, or distorted by taxes and subsidies. Changes in consumer and producer surpluses before and after e-collaboration takes place are related to the nature of the supply shifts used to represent each market scenario. For instance, e-collaboration applied to optimize quality process management lowers production, inventory, distribution, selling, and/or buying costs. In turn, households’, businesses’, and governments’ relative cost structures decline and the aggregate supply curve shifts downwards along the aggregate demand curve.

The magnitude of the supply shift is greater the higher the value-added of the good of services subject to e-collaboration. Parallel, pivotal, convergent, or divergent shifts of the aggregate supply curve are commonly assumed. The analysis of the distributive aspects defines interest groups as producers, consumers, and/or taxpayers and requires a good amount of data to capture their collective action
exerted on governments. Price-elasticities of supply and demand for the goods and services under consideration are required to estimate the impact of e-collaboration on each interest group. They are obtained after using econometric techniques. A higher degree of modeling sophistication yields better parameter estimates, which will render more accurate measures of the net benefits accrued to producers, consumers, and/or taxpayers.

CONCLUSION
E-collaboration facilitates transmission of knowledge in order to seek cost savings and/or output increases. It enhances competitiveness and provides significant benefits to the economy as a whole. The economic impact of e-collaboration can be estimated by measuring changes in the expected economic surplus on certain interest groups. Price interventions, such as taxes and subsidies, distort the benefits and costs of e-collaboration. They should only be implemented when overall welfare maximization is guaranteed.

REFERENCES


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