

## **The EU-US Relative Productivity Performance Revisited**

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After a quarter century of sluggish gains, the US productivity surged in the mid-1990s and sustained a rapid pace despite a series of adverse shocks. Developed nations have interpreted this remarkable turnaround as an opportunity to ride on a new productivity wave to enhance their standard of living. This development triggered a huge appetite for reliable productivity measures to assess progress whether measured by these nations' own past or the experience of the US. Since 2000, this effort translated into more compliance to the international standards illustrated by the 1993 SNA, the release of the OECD productivity manual regarded as the cornerstone of the official productivity statistics, as well as the development of integrated production accounts suitable to growth accounting. These data developments gave rise to a large body of studies which contributed to the elevation of 'productivity' in government policy discourse (see for example Timmer et al. 2008 for the EU-US, Jorgenson 2004 for Canada-US).

Despite these beneficial outcomes, there is room for further improvement. A large strand of the literature has pointed out that standard productivity measures rest on assumptions—constant returns to scale, perfect competition and instantaneous adjustment of inputs—that generally do not stand the test of scrutiny (see Hulten 2009 for a summary). Typically, these assumptions have two major drawbacks: First, they are often at odd with the striking differences in the economic structures that characterize national economies. While these assumptions may be perfectly acceptable for some economies, they can be regarded as stringent for others. Second, these assumptions can potentially lead to misleading assessments as efficiency gains attributed to technical change are instead due to 'returns' associated to technology, varying utilization of inputs or market power.

The EU-US comparison constitutes an interesting case in point. Although both markets are roughly of similar size, large portion portions of the EU market remain segmented thereby not fully taking advantage of economies of scale that seem to be prevalent in the US economy. At the industry level, while some industries, such as motor vehicles or aircrafts, may potentially display similar scale economies, major differences still remain in others. Consider for example distributive trade industries—the largest single contributor industry to the EU-US productivity gap. The US distributive trade sector has experienced major structural changes illustrated by a shift from high street retailing to suburban shopping malls and a surge of big-box stores marked with huge economies of scale, a sharp contrast with the EU where small stores remain the primary business model. These scale effects not only determine the cost efficiency but also determine the potential for marking up prices over marginal cost, reflecting a departure from competitive market structures. On the input side, rigidities in the EU labour market still remain despite the implementation of various structural reforms. This stands in contrast to the US labour market where just-in-time hiring lends support to the notion that firms may be facing reduced employment adjustment costs. Whatever the source of this varying flexibility, the result may translate into different responses to price and technological changes, with important effects on relative productivity performance.

While the literature based on a parametric approach to productivity measurement is fairly extensive, much of its focus has been driven by national economies' agendas. The extension to this framework to the context of cross country comparisons remained scarce despite an earlier attempt by Morrison (1992) which shed new light on the puzzling post-1970 productivity slowdown. Recently, with the contributions from O'Mahony and Vecchi (2005) and Groth et al. (2006), this type of approach has gained some momentum in the wake of the information technology debate. The limitations of these contributions stem either from the adoption of a primal production structure that relaxes only some of the underlying assumptions of the standard model or the little recognition of potential linkages between mark-ups, scale and fixities. For example, O'Mahony and Vecchi have relaxed the constant returns to scale assumption but ignored the varying capacity utilization rate and the rigidities that potentially affect the inputs, which Groth et al. recognized explicitly as being important. However, despite a more general setting, the single equation framework adopted by Groth et al. does not lend itself to an integrated treatment of the relaxed assumptions due to the complex interactions among inputs and output decisions.

In this paper, we seek fresh insights into the intriguing developments in relative the EU-US productivity performance. Specifically, we assess whether the productivity gap favourable to the US conventionally measured is a reflection of a 'pure' technical change or the result of structural differences captured by scale economies, capacity differences or market structures. First, we develop a cost-based production framework with non-constant returns to scale, quasi-fixed capital and labour, variable intermediate inputs along with an inverse demand equation reflecting endogenous output decisions. Second, we exploit a rich industry panel data set for the EU and the US over the 1977-2007 period using a dynamic panel data estimation method that properly accounts for industry heterogeneity.