# Title

The contribution of labor reallocation to aggregate productivity growth: Evidence from Canada, France and the United States

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# Short Summary

A large literature attempts to quantify how factor reallocation contributes to productivity growth. Whereas it was usually thought that most productivity growth came from innovation in existing firms, recent research underscores the importance of firm entry/exit dynamics (e.g. David and Haltiwanger (1992)). At the same time, many studies find that labor reallocation is persistent across sectors. For example, Stewart (2002), using CPS data from 1976 to 2001, estimates that 50% of aggregate productivity growth is attributable to labor reallocation. However, both Bartelsman and Doms (2000) and Foster, Haltiwanger and Krizan (2000), using firm-level data from the U.S., find lesser contributions (0-25%). Lentz and Mortensen (2009) use a growth model to decompose aggregate productivity growth into three components (1) labor reallocation, (2) innovation within existing firms and (3) firm entry/exit dynamics. In their model, firms are assumed to be heterogenous in their ability to introduce new production processes or innovations. At entry, the ability to innovate is supposed to be a stochastic variable. But firms that innovate become more productive and attract workers from other firms. Thus, the introduction of new production processes at the establishment level leads to labor reallocation across firm and across industries. It is possible to estimate the contribution of each term to aggregate productivity growth using the method of simulated moments (McFadden (1989)). The estimation procedure relies on finding a set of parameters that replicate as closely as possible computed moments from

data on employment, sales and wages. Using Danish data, they find that labor reallocation contributes a significantly higher percentage of aggregate productivity growth (55%).

In this article, we assess how general the Lentz and Mortensen results are with respect to the contribution of labor reallocation to aggregate productivity growth, by taking their model to a broader selection of data sets, including data very similar to previous U.S. studies, as well as for Canada and France. Results will also be compared to those obtained using alternative productivity decomposition methods proposed by Baily, Hulten and Campbell (1992)) and by Griliches and Regev (1995)).

The US data is constructed from the Longitudinal Business Database (LBD) and its links to the Annual Survey of Manufacturers (ASM) and the quinquennial Census of Manufacturers (CM) for 1973-2007. The ASM and CM are accessible to researchers in the U.S. Census Bureau Research Data Centers. For Canada and France, we use the firm-level component of two linked employer-employee data sets from Canada and France. French data covers the time period from 1978 to 1996 on 1,142,738 firms obtained through the EAE (Enquête Annuelle d'Entreprises), an annual survey of firms. This is the same source for firm-level data as the one used by Abowd and Kramarz (1999a). The Canadian data stem from the Workplace and Employee Survey 1999-2006 (WES). The WES is a restricted-access data set available in the Statistics Canada network of Research Data Centers (RDC). WES has been conducted annually since 1999. In this study, we use all 8 years of available data (1999-2006). Abowd and Kramarz (1999b) classify WES as a survey in which both the sample of workplaces and the sample of workers are cross-sectionally representative of the target population. Because it does not come from administrative data, our sample of firms is much smaller in the case of Canada and comprises about 6,000 workplaces. In the case of Canada, we are also in the process of securing access to T2/LEAP, an administrative-level firm database constructed from firm tax records. This is a much larger data base and comparisons of the results between WES and T2/LEAP would be useful to assess the advantage and inconvenient of survey versus administrative data.

Preliminary results for Canada using the WES data indicate that firm dynamics explain 33% of aggregate productivity growth while innovation within firm explains an additional 38%. These results indicate that the continual process by which labor is allocated to growing or new firms explains more than 75% of productivity growth. Results for France and the US

are pending. If labor reallocation is found to explain a larger fraction of aggregate productivity growth in the U.S. than in France, this would corroborate similar evidence, for instance by Bartelsman, Scarpetta and Schivardi (2005) who find that firm size at entry is lower in the U.S. than in Europe, but subsequent productivity growth for these firms is faster in the U.S. than Europe. The final conclusion will relate the results to the institutional features of the labor market in the three countries will be made.

Our findings are of relevance to public policy. On the one hand, if innovation within firms is the more important driver of productivity, policies that increase incentives related to R&D are likely to be the best way to increase productivity growth. However, if labor reallocation is the dominant factor, policies that emphasize flexibility and dynamism in a  well-functioning labor market have the scope to be important drivers for productivity. Finally, if most productivity growth is coming from new firms, policies that encourage and promote entrepreneurship are likely to have the highest productivity gains.