



NORTH-HOLLAND

Sources of Sectoral Fluctuations in Business Fixed Investment

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A model of macroeconomic complementarity is used to assess causes of comovement in investment spending across nine sectors of the U.S. economy. It is hypothesized that the irreversibility and uncertainty of investment spending imply a greater role for investment linkages and aggregate factors in investment fluctuations compared with estimates for employment and output. For the average sector, past investment growth across all sectors, changes in aggregate demand, and a common factor account for two-thirds of the variance of investment growth. After accounting for aggregate demand, sectoral shocks explain 70% of the average sector's innovations to investment growth. © 2000 Elsevier Science Inc.

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I. Introduction

Changes in the rate of investment are a major component of the fluctuations in aggregate spending that characterize U.S. business cycles. As in the case of comovement among sectoral output growth rates in Long and Plosser (1987), high correlations in investment growth rates across different sectors of the economy have been used to support an emphasis upon aggregate shocks as the main cause of fluctuations in investment spending. This emphasis underlies the assumption that countercyclical monetary and fiscal policies can offset the spending effects of shocks that are common to the entire economy and the main cause of investment volatility.

In contrast, a central feature of multisector real business cycle models [e.g., Long and Plosser (1983)] is that random shocks specific to a subset of industries can generate the same comovement across sectors previously attributed to common shocks. As summarized

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by Cooper and Haltiwanger (1990) [C-H (1990) hereafter], a sector-specific shock can be transmitted to other sectors by means of factor demand linkages due to technological complementarities in production. For example, a productivity improvement in one sector may result in a greater supply of an input to a second sector, with the latter also raising its demand for complementary inputs from other suppliers. Over time, the original shock may raise output throughout the economy, yielding a change in aggregate spending mistakenly attributed to an aggregate or common shock.

Previous work assessing comovement among sectors that comprise industrial production in the U.S. economy has demonstrated roles for both common and sectoral shocks, with some evidence of a greater effect for the sectoral type. Using monthly data (1948:2–1981:12), Long and Plosser (1987) estimated that a common shock explained 20% of the variation in output innovations for the average sector, implying a major role for the propagation of sector-specific shocks across these industries. Cooper and Haltiwanger (1996) [C-H (1996) hereafter] estimated common shock effects of a similar magnitude for output (29%), employment (23%), and prices (13%) during 1969:1 through 1992:3.

C-H (1990) assessed employment comovements among industries classified at the one-digit level for 1947:1 through 1985:12. Unlike the results for the industrial production sectors, they found that innovations to employment were not highly correlated across these sectors and an average of only 15% of the variation in a sector's innovations was explained by a common factor. These results supported a model of employment comovement within an economy that is imperfectly competitive and subject to underemployment equilibria. In this case, an adverse sector-specific shock leads to reduced demands for final goods and services on the part of the affected sector's employees, causing employment reductions in other sectors that persist if firms attempt to maintain steady inventory levels. Based upon both of their analyses, C-H (1996) concluded that aggregate shocks are less relevant for comovements across broadly defined sectors of the economy. Instead, it is likely that shocks common to similar activities, such as those involving industrial production, have a more significant impact upon employment comovements in those industries.

The results for comovements in output and employment call into question the importance of common shocks in explanations of fluctuations in aggregate spending. The purpose of this paper is to measure the magnitude of sectoral comovements for innovations in investment spending and to determine the relative importance of aggregate versus sector-specific shocks as sources of the innovations. The empirical approaches of Long and Plosser (1987) and C-H (1990), 1996) are applied to new plant and equipment investments across broadly-defined sectors of the economy.¹

The motivating hypothesis for this analysis is that compared to changes in output and employment, changes in investment are less likely to be in response to sectoral shocks and instead are strongly influenced by aggregate shocks. Beneficial shocks to an industry's demand or cost structure may elicit expansions in employment and output in that industry and related sectors that can be reversed at a comparatively low cost if the shock proves to

¹ See Chirinko (1993) and Gordon and Veitch (1986) for a review of empirical results for models of aggregate investment spending which are consistent with the vector autoregressive models estimated in this paper. Examples include: (1) neoclassical models in which investment is a function of current and lagged changes in GDP (the flexible accelerator model) and the user cost of capital; (2) Q-Theory models in which the ratio of market value to replacement cost of capital is used to measure expectations of future output demands and capital costs; and (3) rational expectations models in which unexpected changes in variables such as the money supply and resource prices can affect spending decisions.

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