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The role of allocative efficiency in a decade of recovery[☆]Kaiji Chen^{a,b,*}, Alfonso Irarrazabal^{c,d}^a Emory University, Department of Economics, Atlanta, GA 30322, United States^b Federal Reserve Bank of Atlanta, United States^c Norges Bank, Norway^d BI Norwegian Business School, Norway

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ABSTRACT

The Chilean economy experienced a decade of sustained growth in aggregate output and productivity after the 1982 financial crisis. This paper analyzes the role of allocative efficiency on total factor productivity (TFP) in the manufacturing sector by applying the methodology of Hsieh and Klenow (2009) to establishment data from the Chilean manufacturing census. We find that a reduction in resource misallocation accounts for about 40 percent of the growth in manufacturing TFP between 1983 and 1996. In particular, a reduction in the least productive plants' implicit output subsidies is the primary reason for the reduction in resource misallocation during this period. Moreover, these plants enjoyed above industry-average growth in physical productivity, contributing to the overall improvement in efficient TFP after the financial crisis. Our evidence suggests that Chile's banking reform during the early and mid-1980s is likely to have played an important role in the observed improvement in allocative efficiency.

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1. Introduction

Chile experienced a decade-long economic recovery after its 1981–1982 financial crisis. As shown by panel (a) of Fig. 1, after a declining by more than 20 percent relative to the trend level, Chile's real GDP per working-age population (15–64) started to recover in the mid-1980s and by 1996 was 20 percent above the trend.¹ Similar to the pattern seen in its aggregate economy, a takeoff occurred in the Chilean manufacturing sector after the 1982 crisis. Specifically, in the late 1980s the manufacturing sector began a rapid increase in value-added.

As many researchers have found, total factor productivity (TFP) is one key factor explaining the sustained post-crisis recovery of Chile.² This can be seen by the dynamics of Chile's manufacturing TFP. Panel (b) shows that aggregate TFP in the manufacturing sector closely tracked manufacturing value-added during both the recession and the recovery. In particular, aggregate manufacturing TFP, relative to the trend level, increased by more than 20 percent between 1983 and

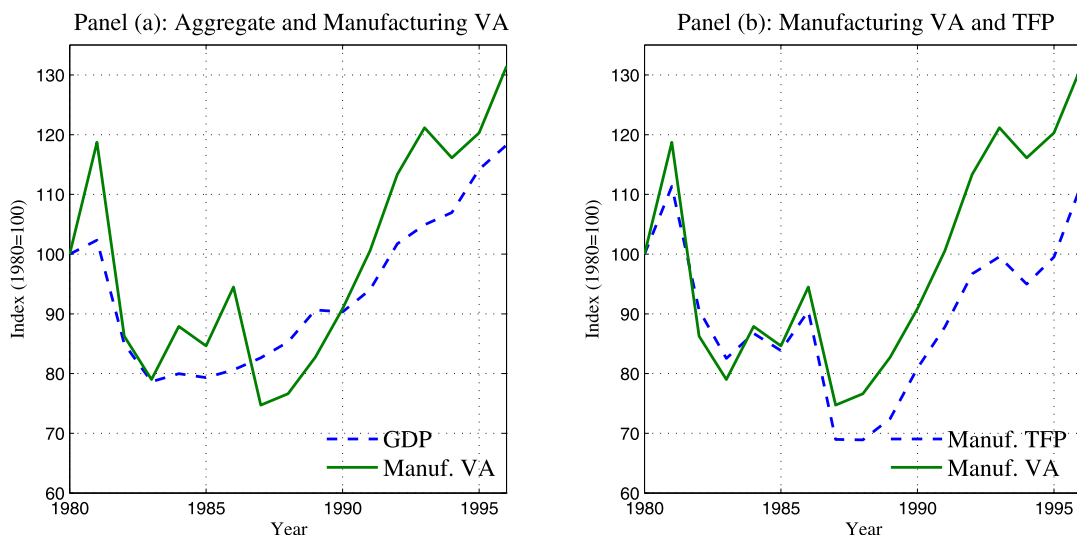
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¹ We assume that the trend level of real GDP per working-age person is 2 percent per year.

² See, for example, Bergoing et al. (2007) for a comparison between Chile and Mexico.



Note: Panel (a) shows Chilean GDP and value-added (referred to as “VA”) for the manufacturing sector, while panel (b) shows value added and TFP for the manufacturing sector. Measured TFP is $\frac{VA}{K^\alpha L^{1-\alpha}}$ with $\alpha = 0.3$. Both GDP and the value-added for manufacturing sector are detrended by 2 percent per year and normalized such that their 1980 values equal to 100. The manufacturing TFP is detrended by 1.4 percent per year and normalized in a similar way.

Fig. 1. Chilean manufacturing value-added and TFP.

Source: authors' calculations.

1996, providing a strong driving force for the aggregate manufacturing output during the recovery. Therefore, understanding the sources of the sustained growth of Chile's aggregate manufacturing TFP and their connection to the policy reforms in Chile offer a useful lens to understanding the post-crisis recovery of Chile's aggregate productivity.

This paper studies the role of allocative efficiency in the recovery of Chilean manufacturing TFP after the 1982 crisis. We use establishment-level data from the Chilean manufacturing census to address these three questions: How important is an improvement in allocative efficiency in accounting for the fast growth in Chilean manufacturing TFP after the crisis? What are the key distortions that have mitigated and, thus, contributed to this improvement in allocative efficiency? What Chilean policy reforms might be potentially important in explaining the improvement in allocative efficiency? To these ends, we employ the framework used in Hsieh and Klenow (2009) to obtain plant-specific output and capital distortions (wedges), as well as physical and revenue productivity measures (TFPQ and TFPR), for each year between 1980 and 1996.

Our results show that between 1983 and 1996, an improvement in allocative efficiency accounted for about 40 percent of the observed growth in aggregate manufacturing TFP. The key factor behind this improvement is a reduction in the cross-sectional dispersion in output distortions, which accounts for essentially all the reduction in the cross-sectional dispersion of revenue productivity during this period. Moreover, the cross-sectional covariance of physical and revenue productivity shows a similar declining pattern to the cross-sectional dispersion of revenue productivity, suggesting an improvement in resource allocation among plants with different productivity. When plants are grouped into TFPQ quintiles, we find that a reduction in the least productive group's implicit output subsidy is the single most important factor for the decline in the resource misallocation during this period. Accordingly, factor inputs were reallocated from the least productive plants towards more productive ones.

Another important factor to understand the recovery of Chile's aggregate productivity is the change in the distribution of physical productivity. We find that, over time, plants with lower initial physical productivity enjoyed faster growth in physical productivity than the industry average during our sample period. As a result, the left tail of physical productivity distribution became thinner. This suggests that Chile's policy reforms that eliminated the subsidies on the initially unproductive plants contributed to not only an improvement of resource allocation among incumbent firms, but also to their faster productivity growth.

It has been argued that the prevalence of self-loans by Chilean banks toward affiliated firms within the business groups led to credit misallocation and the 1982–1983 financial crisis.³ We therefore make a first pass to assess the role that Chile's banking reforms during the early and middle 1980s played in the observed improvement in allocative efficiency and physical productivity. Our regression results suggest that in the early 1980s, Chilean plants with lower revenue or physical productivity had, on average, a higher liability–asset ratio. This suggests that firms with preferential access to bank credit tended to be less productive, and larger than their efficient sizes. Moreover, before the banking reform took place, industries with higher median liability–asset ratio had larger revenue productivity dispersion, suggesting that industries dominated by firms with access to preferential credit were more distorted. Since 1983, however, those firms with higher initial leverage

³ See, for example, Diaz-Alejandro (1985), Harberger (1985), Galvez and Tybout (1985), Tybout (1986), Edwards and Edwards (1987), McKinnon (1991), de la Cuadra and Valdes (1992), and Akerlof and Romer (1993).

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