Dating growth and cycles in China:
A sector-based approach

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Extended Abstract

China's growth has become of systemic importance. It is the first world industrial power and ranks second for GDP. It directly accounts for one third of world growth, and much more if the impact on foreign commodities and component suppliers, along the global value chain, are taken into account. The dating of global business cycles has thus become heavily dependent on the timing of Chinese cycles. However we know very little about such movements of Chinese economic activity. Observers, who were, until ten years ago, impressed by what they considered as decades-long 'miracle growth' (a la Lucas, 1993) in China, are now concerned by a seemingly durable growth slowdown. However, the magnitude and duration of such a slowdown are impossible to gauge due to two contradictory messages. On the one hand, official macroeconomic data paint a picture of unprecedented smoothness in the slowdown (from a peak of 14.2% in 2007 to 6.6% in 2018) with no fall in the level of output, and on the other, short-run indicators document very volatile output movements with a hectic slowdown. The doubts raised by observers on the biases in official, especially industrial output, data over the last decade have not led them to reconsider the, equally dubious, record over the previous three decades.

This paper has two major objectives. The first is to reconstruct, over four decades, at high-frequency (quarterly), China's industrial output on the basis of (official) sectoral data for more than 50 commodities. This will enable us to gauge the degree of mismeasurement in Chinese official aggregate industrial output data, and its variations over a long time span. The second is to establish the first reference dating of industrial cycles using the parametric Bry and Boshan (1971) method, in order to detect classical recessions and episodes of rapid growth. We focus on industrial output because it is the only driver of rapid growth in GDP, the major source of bias in China's official GDP data (Wu, 2002), as well as the only segment of the economy for which disaggregated data is available for such a reconstruction. We will benchmark China's industrial growth and cyclical patterns since the reforms four decades ago against the four decades of Japan's experience from the 1960s.

Conventional wisdom argues that an East-Asian emerging economy like China can experience long-lasting rapid growth along with growth-rate cycles, avoiding the contraction in output associated with classical recessions. The dominant view singles out China, which would have achieved 10% annual GDP growth since the reform four decades ago, and been able to sustain rapid growth for another couple of decades. The stylized facts underlying such conventional wisdom were established on the basis of an observation of GDP growth patterns. Such a focus faces problems for emerging economies for two reasons. The first one is that in such economies the share of agriculture is still so substantial that it seems to insulate GDP from experiencing classical recessions. The second is that it has become usual in advanced countries to focus on GDP movements dominated by services, but this sector is not able to drive

rapid growth in emerging economies. The focus on industry was obvious for early analysts of cycles in the interwar period, like Kuznets (1930), Burns (1934) or Mitchell (1927). It was obvious later for analysts of growth in latecomers (Russia; Gerschenkron(1962)), and more recently in emerging economies (Rodrick, 2012). Existing work with annual data has shown that industry is the driver of rapid GDP growth (Gerschenkron, 1962), and of convergence (Rodrick, 2012).

Increasing doubts have been raised with respect to the reliability of official Chinese macroeconomic data, which suffer from multiple statistical and political-economy biases (Rawski, 1993; 2001; Maddison and Wu, 2002). It is in particular striking that official data do not report the substantial growth-boosting effect of WTO that international experience would have led us to expect (Ching et al.'s (2011) 'missing growth' for China). It is urgent to overcome the too simple view of a mismeasurement associated only with a systematic upward bias. Besides, a sharp disconnect is manifest in the long-run and short-run perceptions about China's growth performance. At the long end, official aggregate data report a smooth real growth slowdown at variance with nominal growth. Annual reported growth is invariably very close to the target set one year earlier, and revisions of provisional estimates are invariably upwards. At the short end, watchers of Chinese cycles, who monitor month-on-month movements, detect recession after recession. Satellite data, available over more than a decade, monitoring 6000 Chinese factories (China Satellite Manufacturing Index), yield the same information as Caixin-Markit's Purchasing Managers' surveys (PMI) for manufacturing.

There is no accepted reference scheme for the dating of China's growth cycles, with quarterly data, the usual frequency for cycle analysis. Existing high-frequency dating, spanning the whole post-reform period, is restricted to normal-growth/growth-recession dichotomy (OECD (2016); TCB (Ozyildirim et al., 2012), and ECRI's (2016)), without allowing for the catching-up rapid-growth phase typical of emerging economies. In such emerging economies "the cycle is the trend" (Aguiar and Gopinah, 2007) and the growth process is marked by large accelerations and decelerations (Pritchett 2000; Hausmann, Pritchett, and Rodrik, 2005; Kar, Pritchett, Raihan, and Sen, 2013), or "stop-start" phases (e.g., Rodrik, 1999, and Jones and Olken, 2008).

How to reconstruct macroeconomic data with biased aggregate national accounts? The answer consists in: first, replicating what was done before the invention of national accounts, that is using a commodities-based approach pioneered by Kuznets (1934) for early emerging economies which are now advanced ones, or what was done to address the data shortfalls of the soviet economic performance (Gerschenkron, 1947; Bergson, 1961); second, reaping the benefits of modern national accounting by using intput-output matrices to generate value added data. In this paper, we thus reconstruct a quarterly alternative to the official aggregate industrial output value added data, with commodities series and input-output matrices for China (in the tradition of Wu (2013) and Ozyildirim et al. (2013)) over four decades following the reforms (1980 (I)-2019 (IV)).

In order to evaluate our commodities-based reconstructed industrial output data we consider two appropriate benchmarks: Japan as the typical rapid-growth economy from

the 1960s, as well as China's prior peer in East Asia; and tens of emerging economies' cycle features.

To establish a reference chronology of cycles in China, it is necessary to deal with the specificity of a rapidly growing economy (Girardin, 2005). In such a context, the standard expansion/recession dichotomy leaves place to a three-pronged distinction between recession, normal growth and rapid growth. In order to detect the timing of such phases, we use the standard recession-dating algorithm a la Bry and Boshan (1971) and Harding and Pagan (2002), and propose an extension in which expansions are divided between normal and rapid growth episodes.

We obtain three major results. First, official over-reporting of industrial growth was widespread over the first two decades after the reforms and resurfaced in the 2010s, in contrast with growth smoothing in the 2000s. Second, while official data detect three decades of rapid catching-up growth in China, the reconstructed data implies that rapid-growth only started after WTO entry -which thus had a unique growth-boosting effect on China- and stopped with the global financial crisis (GFC). In contrast, the post-2010 period is characterized, not by a slowdown, but by recurrent recessions. Third, we find that the diffusion of recessions across sectors which had fallen for two decades went up in the last decade

Our work is related to prior attempts at reconstructing China's macroeconomic data which have intensified in the recent period. This has focused on GDP components, such as consumption (Nakamura, et al., 2016; Zhang and Zhu, 2015), or on systematizing official data (Chang, Chen, Waggoner and Zha, 2015). Earlier debates involved Wu (2000), Maddison and Wu (2008), who showed the biases in official data, on the one side and Holz (2006; 2014), Fernald, Malkin and Spiegel (2013), and Fernald, Hsu and Spiegel (2015), who broadly validated official data, while Henderson et al. (2012), like Clark et al. (2017), focused on satellite data as a benchmark. However, as a rule, such work does not provide us with high frequency industrial value added data. A pioneering attempt in this direction was made by Holz (2014) who proposed his own reconstruction of an industrial activity index from the early 1980s, which unfortunately suffers from many of the drawbacks of the official series on which it draws.