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**Abstracts of research**

“The Unbalanced Growth Hypothesis and the Role of the State: the Case of China’s State-owned Enterprises” (Forthcoming in the *Journal of Development Economics*)

Albert Hirschman’s unbalanced growth hypothesis suggests that a developing economy can promote economic growth by initially investing in industries with high backward and forward linkages. In the case of Chinese economic policy today, one application would be the continued presence of the state in high-linkage sectors and the strategic withdrawal of the state from low-linkage sectors. The evidence shows that while the degree of linkage plays an important role in generating economic growth in China, province-specific withdrawal strategies for the state sector have no effect on economic growth.

“No Razor’s Edge: Reexamining Alwyn Young’s Evidence for Increasing Inter-Provincial Trade Barriers in China.” (*The Review of Economics and Statistics*, 2009)

Alwyn Young (2000) argues that barriers to inter-provincial trade in China have increased during the reform period. This paper critically examines each of his five arguments and the evidence he presents. In all five instances the argument is problematic and the evidence not robust. A comparison with the U.S. shows the Chinese evidence to be well within the range of that of a normal, relatively integrated large economy.

“China’s Economic Growth 1978-2025: What We Know Today about China’s Economic Growth Tomorrow.” (*World Development*, 2008)

Extrapolation of past growth into the future suggests that China’s GDP, in purchasing power terms, exceeds that of the U.S. around 2010. This paper explores China’s future growth prospects and the potential drivers of future growth. A first approach examines in how far China’s recent economic development matches standard growth patterns identified in development economics and trade theory. In a second approach, GDP is decomposed into its income components, which in turn are explained, for the reform period, by the quantity and quality of labor; future GDP can then be re-composed from data on the future quantity and quality of labor that are available today. Overall, China’s economic growth is likely to continue at current rates through 2015 before it gradually slows. Economic growth in China on this scale has a number of implications for China itself and for the world.

“Revisions to China’s GDP Data Following the 2004 Economic Census: More Questions Than Answers?” (*The China Quarterly*, 2008)

In 2006, China’s National Bureau of Statistics undertook a benchmark revision of national income and product accounts statistics based on the findings of the 2004 economic census. The benchmark revision covers primarily the years 1993-2004 with revised economy-wide and sectoral output values. The new data have three implications. (i) Despite all the hype only a few years ago about data falsification by local statistical authorities in China, the 2004 economic census results validate the provincial aggregate output values and invalidate the center’s national ones. (ii) At the national level, economy-wide as well as sectoral nominal values were revised but real growth rates of some sectors remained unchanged. That is not plausible, and implies that at least the secondary sector real growth rates are erroneous. (iii) The benchmark revision raises questions about the quality and meaning of a large body of official statistics. Ultimately, it casts doubt on the professionalism and sincerity of China’s statistical authority.

“Spatial Price Differences in China: Estimates and Implications.” With Loren Brandt.  
(*Economic Development and Cultural Change*, 2006)

Prices differ across space: from province to province, from rural (or urban) areas in one province to rural (or urban) areas in another province, and from rural to urban areas within one province. Systematic differences in prices across a range of goods and services in different localities imply regional differences in the costs of living. If high-income provinces also have high costs of living, and low-income provinces have low costs of living, the use of nominal income measures in explaining such economic outcomes as inequality can lead to misinterpretations. Income should be adjusted for costs of living. We are interested in the sign and magnitude of the adjustments needed, their changes over time, and their impact on economic outcomes in China. In this article, we construct a set of (rural, urban, total) provincial-level spatial price deflators for the years 1984-2004 that can be used to obtain provincial-level income measures adjusted for purchasing power. We provide illustrations of the significant effect of ignoring spatial price differences in the analysis of China’s economy.

“New Capital Estimates for China.” (*China Economic Review*, 2006)

Data on physical capital are an indispensable part of economic growth and efficiency studies. In the case of China, economy-wide fixed asset series are usually derived by aggregating gross fixed capital formation (net of depreciation) over time, and sectoral/ownership-specific series by correcting the limited official fixed asset data available. These procedures, to varying degrees, ignore that (i) gross fixed capital formation does not equal investment, (ii) investment does not equal the value of fixed assets newly created through investment, (iii) depreciation is an accounting measure that bears no necessary relation to changes in the production capacity of fixed assets, (iv) official fixed asset data, where available, incorporate significant revaluations in the 1990s, and (v) “net fixed assets” do not measure the contribution of fixed assets to production. This paper derives economy-wide fixed asset values for 1953-2003, correcting for these shortcomings. It uses both the traditional, cumulative approach and a new, so far unexplored method of combining economy-wide depreciation values and an economy-wide depreciation rate to directly yield economy-wide fixed assets. The derived fixed asset time series are evaluated in a comparison with each other as well as with series in the literature, leading to the recommendation of a specific choice of fixed asset time series.

In the same issue of the journal, Gregory Chow wrote a comment and I responded to his comment.

“China’s Reform Period Economic Growth: How Reliable Are Angus Maddison’s Estimates?”  
(*Review of Income and Wealth*, 2006)

Chinese economic growth statistics are controversial. In recent years they have been challenged on technical grounds as well as on suspicions of data falsification. Angus Maddison in a 1998 OECD study goes further in that he questions China’s long-run growth statistics and proceeds to provide an alternative time series. His average annual real GDP growth rate for China in the reform period (1978 through 1995) is 2.39 percentage points below the official one. Angus Maddison’s revisions were subsequently incorporated into the Penn World Tables; his GDP estimates for China, thus, have found their way into numerous cross-country studies. This paper critically examines the validity of Angus Maddison’s revisions to official data.

Angus Maddison wrote a response in the same issue of the journal, to which I then replied in a later issue.

“China’s Statistical System in Transition: Challenges, Data Problems, and Innovations.”  
(*Review of Income and Wealth*, 2004)

While China’s official statistics are often regarded as of questionable quality, critics are rarely aware of just how difficult it is to compile accurate statistics in a developing and transition economy. This paper traces the challenges economic reforms pose for the development of China’s statistical system, establishes a typology of the resulting data problems in official Chinese statistics today, and examines how these challenges and data problems are being addressed

through institutional innovations in data compilation. Analysis of China's data compilation methods allows broad judgments on data quality. Special attention is given to GDP data as the aggregate measure of productive activities in China.

“Deconstructing China's GDP Statistics.” (*China Economic Review*, 2004)

China's National Bureau of Statistics has on repeated occasions explained in great detail how its GDP statistics are derived from underlying data. Based on these explanations, this article reconstructs Chinese official household consumption, which accounts for half of GDP. The findings are condemning. Not only do the various official explanations offered between 1997 and 2001 differ from each other, but none allows the researcher to reconstruct household consumption. Furthermore, the relationship between the GDP component household consumption and the underlying data varies from year to year, which suggests that time series comparisons of Chinese GDP may be invalid.

*China's Industrial State-owned Enterprises: Between Profitability and Bankruptcy.*  
(Monograph, 2003)

After decades of declining profitability, China's industrial state-owned enterprises appear to be obsolete. This book utilizes extensive data and qualitative as well as quantitative analyses to examine the reasons for the decline in the profitability of these industrial state-owned enterprises, to determine their current profitability patterns across various dimensions, and to account for profitability gaps between these enterprises and those managed under other ownership forms. China's recent enterprise reform measures are also evaluated. A differentiated picture emerges that clarifies past developments and illuminates future prospects of the reform of industrial state-owned enterprises in China.

“‘Fast, Clear and Accurate:’ How Reliable Are Chinese Output and Economic Growth Statistics?” (*The China Quarterly*, 2003)

China's statistics are widely viewed as unreliable, with data falsification in order to meet economic growth targets increasingly the norm. This paper examines some of the most recent criticism of statistics on China's industrial value-added and Gross Domestic Product, and shows this criticism to be unfounded as it is based on misunderstandings about the meaning and coverage of particular data. A lack of evidence on data falsification does not mean that China's statistical system is necessarily honest in its statistical reporting, but recent developments in China's statistical system further suggest that data falsification at the higher levels of the statistical bureaucracy is unlikely. Nevertheless, even if data are not being purposefully falsified by the National Bureau of Statistics, the margin of error in much of the published data is likely to be sufficiently large to allow the statistical authority a choice of final value from a relatively wide range of equally correct values.

“Long Live China's State-owned Enterprises: Deflating the Myth of Poor Financial Performance.” (*Journal of Asian Economics*, 2002)

Industrial SOE profitability declined drastically in the course of the reform period, and SOEs are always less profitable than non-SOEs. However, non-SOE profitability declined similarly over time as SOE profitability, and non-SOEs are no better suited to withstand shocks such as the 1989/90 economic downturn. The gap between SOEs and non-SOEs can be explained by just two factors, namely a higher capital intensity in SOEs (in part a historical remnant) as well as circulation tax rates for SOEs that are double those in non-SOEs. This suggests that privatization of SOEs is at best sufficient to reduce the excessive capital intensity and taxation (and thus improve profitability), but not necessary.

“Institutional Constraints on the Quality of Statistics in a Developing and Transitional Economy: the Case of China.” (*China Information*, 2002)

Obtaining comprehensive and accurate statistics in a rapidly developing economy with a large informal sector is necessarily difficult. A simultaneous process of systemic transition does not facilitate the task. In the case of China's gross domestic product, some data are currently not collected because the necessary institutions are not in place, while various imputations severely challenge the capabilities of the statistical personnel. Central-local conflicts and reliance on other government departments for many statistics further complicate the compilation of comprehensive and accurate statistics. Nevertheless, China's statistical authority has successfully implemented a series of institutional innovations throughout the 1990s that brought drastic improvements. The example of the industrial sector shows a credible commitment to meaningful statistical work.

“The Impact of Competition and Labor Remuneration on Profitability in China's Industrial State-owned Enterprises.” (*Journal of Contemporary China*, 2002)

The literature presents two competing hypotheses as to why the rate of profitability in industrial SOEs fell during the reform period. One is a decline in monopoly rents as enterprises in other ownership forms gained market share over time, the other is excessive labor remuneration. This article shows that each of the two hypothesized causes affects the final measure “profit” at different stages in its derivation. If the two different channels through which profitability is affected are measured using two relevant intermediate variables, regression analysis shows that the two causes are not competing, but complementary in the explanation of overall profitability.

“The Impact of the Liability-Asset Ratio on Profitability in China's Industrial State-owned Enterprises.” (*China Economic review*, 2002)

A high liability-asset ratio of industrial SOEs does not necessarily have the detrimental effect on enterprise profitability that Chinese policymakers have in recent years come to believe it does. Theoretically, the causality can have either sign, depending on the assumptions made. Empirically, once the endogeneity of profitability and other factors are controlled for, a high liability-asset ratio indeed tends to imply a high level of profitability. This suggests that current industrial SOE reforms in China which focus on debt alleviation are misguided.

“The 1997-1998 Break in Industrial Statistics: Facts and Appraisal.” With Yi-min Lin. (*China Economic Review*, 2001)

In 1998 the National Bureau of Statistics in the published industrial statistics modified the scope of enterprises covered and the enterprise classification system. This paper highlights the modifications and identifies two implications. First, the use of a proportional allocation rule in data aggregation boosts the size of “public ownership,” an important cornerstone of socialism. Second, the switch from compiling detailed statistics on enterprises identified by an administrative criterion to enterprises that exceed a fixed volume of sales revenue poses new difficulties for comparative data analysis, but also represents a change in statistical practice that may yet lead to data of better quality.

“Pitfalls of China's Industrial Statistics: Inconsistencies and Specification Problems.” With Yi-min Lin. (*The China Review*, 2001)

This paper investigates how the definition of industrial variables and the classification of industrial enterprises in the published statistics have changed over time. Most of the changes have caused severe comparability problems in both time series and cross-sectional data. Yet these changes all too often are not explained or even noted by China's statistical authority. Not astonishingly, much of the research literature is not aware of many of the changes, raising questions about the validity of some research studies.

“Economic Reforms and State Sector Bankruptcy in China.” (*The China Quarterly*, 2001)

The extent of bad loans in the state banks, low profitability of the state-owned enterprises, and the fiscal deficit all reflect financial difficulties in different parts of the state sector. This paper consequently views the state sector in total by consolidating the balance sheets of the state banks,

the state-owned enterprises, and the government. The consolidated balance sheet reveals that while in 1978 state sector net worth was almost equivalent to state sector assets, by 1997 state sector liabilities to households threatened to exceed state sector assets. As state sector net worth turns negative, the Chinese state becomes bankrupt. (The deterioration in state sector net worth came about through numerous channels, four of which are explored in more detail in the paper.) The deterioration in state net worth reflects a quasi-privatization where the state retains the right to determine the use of the physical assets, and pays for this right with excessive returns to household claims.

“Why Do Aggregate Production Functions Work? Fisher’s simulations, Shaik’s Identity and Some New Results.” With Jesus Felipe. (*International Review of Applied Economics*, 2001)

Micro production functions (production functions modeling one productive process at a time) can only be aggregated into economy-wide production functions under assumptions that are never met in reality. Why do aggregate production function estimations then often yield credible results? The paper shows that the Cobb-Douglas production function under only two assumptions is identical to the national income accounting identity (GDP calculated using the production approach equals GDP calculated using the income approach). The two assumptions are (i) constant factor shares, and (ii) constant growth rates of wage and profit rates. In simulations we gradually relax these two assumptions in an attempt to determine the variation in factor shares and in the growth rates of wage and profit rates needed to make the Cobb-Douglas production function yield poor results. It turns out that the Cobb-Douglas form is robust to relative large variations in the factor shares. What makes the Cobb-Douglas form sometimes fail in production function estimates are variations in the growth rates of wage and profit rates.

“Identifying the Patterns of Profitability Across Chinese State-owned Enterprises: Which Industrial State-owned Enterprises in China Are Profitable?” (*Journal of Asian Business*, 2001)

The article examines the impact of size, ownership level, sector-specific characteristics, and location on the profitability of industrial SOEs in the most recent years. In regression analysis, only size and sector-specific characteristics turn out to have an important effect on enterprise profitability; the paper then through a cluster analysis identifies patterns across sectors. China is fortunate in that relatively profitable sectors are large both in terms of output and employment, and contribute much to aggregate SOE profit. In order to raise aggregate SOE profit, two specific low-profitability sectors which contribute much of the losses should be targeted for reform, but otherwise SOE profitability across all sectors needs to improve. This can in part be achieved by closing the least profitable SOEs which persist across all sectors.

“Banking and Enterprise Reform in the People’s Republic of China after the Asian Financial Crisis: An Appraisal.” With Tim Zhu. (*Asian Development Review*, 2000/2001)

Important factors behind the banks’ bad loan and the enterprises’ low profitability problem are a lack of managerial autonomy, proper incentive mechanisms, and control structures. Recent efforts to stabilize the financial system and to reform SOEs do not address these issues, as they are largely re-distributive, shifting financial losses between different agents of the economy rather than improving the efficiency of both the financial and real sector. The paper proposes major reforms that properly address the problem of bad debts and SOE losses.

“China’s Monetary Reform: The Counterrevolution from the Countryside.” (*Journal of Contemporary China*, 2001)

The article examines the issue of rural financial intermediation, in particular the semi-formal rural cooperative funds established in the countryside throughout the 1990s. It explains the reasons for the rise of these funds, explores their institutional advantages and shortcomings, documents the discussion within the state bureaucracy and central government that finally led to their closure, and draws lessons from the experience of the rural cooperative funds for financial reform.

“The Changing Role of Money in China and Its Implications.” (*Comparative Economic Studies*, 2000)

The changing role of money during economic transition is not something noted in the literature. Yet understanding the role of money in Marxist theory and socialist reality, in contrast to the role of money in a market economy, leads to insights with great explanatory power. This paper identifies the causes of changes in the role of money during the reform period, and derives the implications of the changing role of money for institutional and functional arrangements in the financial system.

“Contractionary Investment Policies in China 1988/89: Accounting for the Implementation Difficulties and Successes.” (*The China Quarterly*, 1999)

In 1988/89, the central government attempted to curb investment in fixed assets through direct administrative controls on investment. But the outcome of and the compliance with initial central government instructions were ambiguous, questioning the ability of the central government to exercise timely macroeconomic control. While previous work had concentrated on a central-provincial conflict as well as on the choice of policy tools to explain the implementation difficulties, this paper shows that these are at most partial aspects. The focus on the provincial tier is misplaced; all tiers, including central ministries as well as subprovincial tiers obstructed implementation of the contractionary investment policies. Neither is the question one of the appropriate macroeconomic tool per se. Rather, success or failure of contractionary investment policies hinges on the degree to which implementation requires lower-level tier microeconomic decisions on individual projects. Execution of decisions is not the problem, but reaching the necessary, discretionary decisions is. To the extent that such microeconomic decisions can be achieved or avoided altogether, contractionary investment policies are successfully implemented.

*The Role of Central Banking in China's Economic Reforms*  
(Monograph, 1992)

This monograph provides institutional details on the People's Bank of China, examines how it conducts monetary policy (traditional planning instruments vs. market-oriented monetary policy instruments), and then concludes on the impact of monetary policy on the economy and on the linkages between monetary policy and economic reforms.

“The Institutional Arrangements for the Production of Statistics – OECD: China Governance Project.” (*OECD Statistics Working Paper STD/DOC(2005)1*; Chapter 5 of the OECD's *Governance in China*)

The purpose of this working paper is to provide an overview of recent discussions on the quality of Chinese data and to describe and evaluate the institutional organization and methods of data compilation in China. The first part outlines key criticisms of Chinese data and examines their validity. The second part describes the institutional organization of statistical data compilation in China—with a focus on the National Bureau of Statistics as China's statistical authority—and the latest innovations in data collection. The third part evaluates institutional aspects and data collection methods with reference to the data problems noted in the first part by pointing out some shortcomings and discussing various reform proposals.

“Assessment of the Current State of China's Economic Reforms.” With Tim Zhu. (book chapter, 2003, and *The Chinese Economy*, 2002)

Despite two decades of economic reform, China's transition to a well-functioning market-oriented economy is as yet incomplete. The currently most pressing issues are the financial crises in the state sector, i.e., in the state-owned enterprises, the state banks, and in government finances. We identify the reform measures taken to resolve these crises and analyze their effectiveness. On a World Bank list of reform measures for transition countries, China ranks particularly low on enterprise and property rights reform. We evaluate the importance of accelerated property rights

reform in light of the three financial crises and the reform measures currently under way in China. Our overall conclusion on the current state of reform in China is cautiously positive; the set of reform measures that are being implemented may well be optimal in the long run, given the various reform constraints.