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THE 'LEWIS TURNING POINT' IN CHINA AND ITS IMPLICATION FOR THE EMERGENCE OF A 'MIDDLE INCOME TRAP': EVIDENCE FROM PROVINCIAL DATA

Abstract:

Economic development in China has major implications for the world economy. A China which pushes on to become a high income economy will command considerable influence on the world stage. However, to the extent that China is caught in a middle income trap (MIT), that influence may be mitigated. The literature suggests that the emergence of the Lewis Turning Point (LTP) will signal the possible onset of a MIT. This paper, therefore, pursues the question of whether or not a LTP has been reached in China – an issue of some debate in the literature – through the application of provincial data to a simple fixed effects econometric model designed to detect the presence of a LTP.

Keywords:

Middle Income Trap; Lewis Turning Point; China

JEL Classification: O10

1.   Introduction

The far-reaching consequences of China's future economic performance on the global economy has created great interest in the way in which economic development occurs in China. For this reason, the proximity of China's economy to the Lewis Turning Point (LTP), defined in this paper as the level of per capita income at which the rate of labour transfer from the traditional sector to the modern sector switches from an increasing rate to a decreasing rate (Wang and Zhong, 2012), has been just one measure of whether the extensive high rates of economic growth that have been seen in the past decades is likely to continue. Coupled with the onset of the LTP in China is the fear that its appearance will presage the capture of the Chinese economy in what has become known as the 'Middle Income Trap' (MIT). The later phenomenon, it has been argued, has been observed in a number of developing countries which have reached middle income status, but have been unable to sustain growth at a level that would transform them into high income economies (Agenor, Canuto and Jelenic, 2012). This fear, that China may follow other developing countries into the MIT, has led researchers to ask if China is approaching the LTP. Much of the academic debate surrounds the calculation of the LTP and various attempts, generally based on global data from other countries being compared with national data from China, have had mixed results.

This paper proposes using data from China at a provincial level, rather than drawing on comparisons with other countries, to assess the proximity of the LTP in China. It is evident that economic development across China is not evenly spread. The strongest growth has been experienced in the Coastal areas while the Central and Western provinces are yet to see such advances. It is possible that, by treating China as a whole, the vastly different stages of growth experienced by regions throughout China is obfuscating the calculation of the LTP and gives rise to the mixed results found in past literature. By focusing on provincial data, and appropriate groupings of provinces, this research will endeavour to overcome this problem in assessing LTP values and establish whether or not groupings of China's provinces have been captured in a MIT.

In section 2 the literature relating to both the LTP and a MIT is canvassed. The paper builds on this by establishing a theoretical base and outlining the choice of research method in section 3 and section 4 provides details of the data employed in the analysis. The results are presented in section 5 and discussed in section 6. Section 7 concludes.

2.   Literature Review

The LTP concept was introduced by Lewis (1954) and is based on the labour experience of two sectors of the economy, the rural or traditional sector and the urban or modern sector. It is assumed that many economies have an unlimited supply of labour when wage levels are at subsistence levels and labour supply comes mainly from primary industries such as subsistence agriculture. In the subsistence sector, overpopulated relative to its natural resources, the marginal product of labour is typically zero so that there is no change in the output of this sector when units of labour are offered work in the modern sector (Garnaut, 2010). In the modern sector, capital formation and

technological progress give rise to increased output and profits, but not, initially, to a rise in wages because of labour's zero opportunity cost. Thus, for a time, the modern sector can grow by absorbing the surplus labour of the traditional sector. However, once this surplus labour is exhausted, the marginal product of labour in the traditional sector rises above zero and wages in the modern sector must increase as a result in order to compete labour away from the traditional sector. It is this point in economic development that Lewis determined was a turning point for a country (Lewis, 1954, Zhu and Cai, 2012). Before the turning point, the transformation into a modern economy was rapid with a significantly higher rate of growth of Gross Domestic Product (GDP) compared with other already developed economies. After the turning point economic growth slows as the comparative advantage that the economy once had because of surplus labour dissipates (Wang & Weaver, 2013).

Turning to consideration of the MIT, Felipe et al (2012) assert that the term was coined by the World Bank in 2007 to refer to those economies that were classed as middle income and which were growing at a slower rate than either the richer or poorer economies. It was considered that the industries that had previously driven growth in middle income economies had become uncompetitive on a global scale. The "trap" occurs because, with uncompetitive industries, the economy cannot sustain the higher rates of growth required to achieve an even higher income per capita (Wang & Weaver, 2013). For Zhu and Cai (2012) the 'trap' referred to a state of equilibrium that is so stable that the normal short term forces cannot affect or move the economy out of the trap.

Much of the recent academic debate surrounding China's economic growth and the inevitable slowing down of the rate at which the country has grown has centred around the concept of the LTP, whether it has been reached and the implications of this for China's potential to enter a MIT (Felipe, Abdon and Kumar, 2012; Wang and Weaver, 2013; Huang and Jiang, 2010; Zhu and Cai, 2012). Generally it is argued that the LTP signals a slowing down in economic growth as the economy transitions from a traditional to a modern sector economy. This can result in a period in which economic growth slows to a rate at which it takes an extended period of time for per capita GDP to further increase and move the economy past the middle income category to a high income category.

However, empirical findings have not been consistent. Those who argue that China has reached a LTP include Zhu and Cai (2012), who, for example, found that China had passed the LTP and was moving into a human capital accumulation stage. This stage is seen to be meaningful in moving beyond the middle income phase, and, it is argued, was apparent in the continuing economic development of countries like Japan and Korea. A shift to this stage is indicative of a high income country and if they are correct, it is doubtful that China will be caught in a MIT. Agenor et al (2012) concur with this finding and argue that China provides an example for other countries to follow in order to avoid the MIT.

Amongst those who argue that China is yet to reach a LTP are Wang and Zhong (2012), Wang and Weaver (2013) – who considered that China will exhaust surplus labour in

the next ten years, and Das and N'Diaye (2013) who conclude that China will cross the LTP between 2020 and 2025.

Other writers have also determined that China is yet to reach the LTP, but, in addition, argue that the economy will be able to avoid the MIT. These include Eichengreen, Park and Shin (2013), who note China's considerable investment in secondary education, and Felipe et al (2012) and Song and Zhong (2010) who base their conclusions on the proviso that China must deepen the reforms around areas such as social justice, intellectual property and research and development.

China's vast population, geographical area and unusual economic growth patterns make it difficult to ascertain what stage of economic development China has reached. However, continuing research on the existence of a LTP is essential to determine at what point it occurred or is likely to occur in the future. This paper proposes the use of Chinese provincial data to identify the likely turning point in the Chinese economy.

3.   Theory and Method

As discussed in the data section below, the analysis in this paper will be based on the use of panel data from China's provinces. The essence of the relationship between the ratio of traditional labour to total labour can be expressed as a function of the level of GDP per capita. Wang and Zhong (2012), hypothesizes that '… [A]s a country's economy continues to grow, the proportion of [traditional] labour in the total labour force will experience a process of initial accelerated decline followed by a reduced rate of decline', which can be expressed by the cubic equation:

$$Y_{it} = a + b_1 X_{it} + b_2 X_{it}^2 + b_3 X_{it}^3 + \varepsilon_{it} \qquad (1)$$

Where:

Y_{it} = is the dependent variable and is given by the ratio of traditional labour to total labour in Province i at time t.

X_{it} = is an independent variable and is given by the natural log of real per capita GDP in province i at time t.

b_{1-2} = are the coefficients for two different versions of X_{it}: b_1 for X_{it}; and b_2 for X_{it}^2.

ε_{it} is a random error term.

This expression of the functional relationship between the ratio of traditional labour to total labour and per capita GDP assumes that, in the process of development, the ratio of traditional labour to total labour will decline slowly initially, then decline at an increasing rate and, eventually, as the Lewis turning point (LTP) is attained, begin to decline at a decreasing rate. This scenario requires b_1 and b_3 to be positive and b_2 to be negative.

The percentage change (decline) in the ratio of traditional labour to total labour resulting from a one percentage change (increase) in real GDP per capita is given by the first derivative of (1):

$$\delta Y_{it}/\delta X_{it} = b_1 + 2b_2 X_{it} + 3b_3 X_{it}^2 \qquad (2)$$

To find the level of GDP at which the rate of change in the ratio of traditional labour to total labour ceases falling at an increasing rate and continues to fall at a decreasing rate for a one percent change in GDP the second derivative of (1) is set equal to zero:

$$-b_2/3b_3 = X_{it} \qquad (3)$$

Thus, once the coefficients have been estimated they can be used to calculate the X_{it} which will be the natural log of the LTP value of per capita GDP. To find this value we take the exponential of the calculated value of X_{it}.

As the data to be employed is panel data, the regression is undertaken using the Stata fixed effects analysis procedure.

4.   Data

The foregoing model has previously been applied by Wang an Zhong (2012) to data from a variety of countries with the results used to identify the level of GDP per capita at which the LTP is likely to occur. In this paper the model is applied to Chinese provincial data in an attempt to ascertain from specifically Chinese data an estimate for the per capita GDP in China for the LTP. Estimating the model calls for data on labour force. Unfortunately only data on employment was available. Two separate employment data sources were available. However, neither source provides data on 'traditional' employment so a proxy needed to be used in calculating the ratio of 'traditional' employment to total employment. The first proxy, rural employment, was available for each province for the period 1998-2011 from the National Bureau of Statistics of China website. A disadvantage of this proxy is that although the major portion of rural employment can be expected to be agricultural (traditional) employment, at least part of rural employment will be 'modern' employment. A second possibility, and the one utilised in this paper, was primary employment. It was chosen because it is likely to be closer to the meaning of traditional employment. However, it must be kept in mind that primary employment will include mining related activities. The ratio of primary employment to total employment was calculated from data provided by dX EconData for the period 1998-2010. Unfortunately, in almost all provinces, data on primary employment for 2006 was missing, requiring the ratios for this year to be estimated by taking the average of the ratios found in each of the adjoining years. Data on real provincial GDP was calculated using the 1998 current value for each province and adjusting this by the reported movement in the real provincial GDP index provided for each province on the National Bureau of Statistics of China website. Provincial population data was also obtained from this source and used in the computation of real per capita GDP for each province.

Provinces were aggregated into regional groupings as per the following.

Provinces and their geographic region

Province	Region	Province	Region
Beijing	Coastal	Henan	Central
Tianjin	Coastal	Hubei	Central
Hebei	Coastal	Hunan	Central
Shanxi	Central	Guangdong	Coastal
Inner Mongolia	Central	Guangxi	Coastal
Liaoning	Coastal	Hainan	Coastal
Jilin	Central	Chongqing	Western
Heilongjiang	Central	Sichuan	Western
Shanghai	Coastal	Guizhou	Western
Jiangsu	Coastal	Yunnan	Western
Zhejiang	Coastal	Tibet	Western
Anhui	Central	Shaanxi	Western
Fujian	Coastal	Gansu	Western
Jiangxi	Central	Qinghai	Western
Shandong	Coastal	Ningxia	Western
		Xinjiang	Western

5.   Results

Table 1 reports the results of our analysis using data for all provinces, western provinces, central provinces and coastal provinces.

Table 1

Fixed   Effects   Linear   Regression.
Dependent Variable: Y_{it}

Independent Variables	All Provinces	Western Provinces	Central Provinces	Coastal Provinces
X_{it}	-1.246* (.740)	-5.424* (3.155)	4.868 (6.201)	3.972*** (1.370)
X_{it}^2	.111 (.078)	.590* (.358)	.558 (.671)	-.418*** (.139)
X_{it}^3	-.004 (.003)	-.022 (.014)	-.021 (.024)	.014*** (.005)
constant	5.341** (2.334)	17.578* (9.2574)	-13.309 (19.121)	-11.776*** (4.481)
Observations	403	130	117	156
R^2	.792	.898	.728	.799

Note: The quantities in parentheses below the estimates are standard errors. ***, ** and * indicate significance at the 1 per cent, 5 per cent and 10 per cent level respectively.

6.   Discussion

The results only provide support for the arrival of the LTP for the coastal provinces. For coastal provinces all coefficients are of the expected sign and significant. For China as a whole and for the western provinces, the results suggest that labour is still flowing from the primary sector to the modern sector and that the LTP is yet to be attained. For China as a whole, the data for all provinces does not conform to the expectations of Wang and Zhang (2012) and indicate that the decline in the ratio is, if anything, accelerating – although the coefficients are not highly significant. Typically the western provinces are considered the least developed economically and this is reflected in their very low per capita GDP when compared to both the central and coastal provinces. If any area of China is still to reach the Lewis turning point, it will be the western provinces. Our results confirm this. Thus we can conclude that the western provinces are still in the relatively early development phase and will continue to grow for some years into the future.

The central provinces, as might be expected given their geographic position, tend to be a mixture of provinces that are growing well and provinces that are lagging. Overall, the findings are similar to those of the Western provinces however none of the coefficients are significant and it is not therefore possible to identify a Lewis turning point in this data.

Economic development has primarily taken place in the Coastal provinces and it is here that we would expect to find the best evidence for the Lewis turning point. This indeed proves to be the case. This finding supports the hypothesis that the Coastal provinces, on average, have reached or passed the Lewis turning point.

Utilising equation (3) and the results reported in table 1 for the coastal provinces, we compute a value of approximately RMB 18,500 for per capita GDP at the Lewis turning point for coastal provinces.

These findings have a number of implications. First, in 2011 there were only fifteen provinces in China that had clearly passed a per capita GDP of RMB 18,500 (in fixed 1998 RMB) and five more that had recently achieved it. Most of these, of course, were located in the coastal region. Many of these provinces were well beyond this value. For example, Shanghai had a per capita GDP in excess of RMB100,000 and Tianjin in excess of RMB 56,000. Clearly, these provinces had passed beyond middle income to high income and had not become trapped as a result of reaching the Lewis turning point. Thus, on the basis of provincial data, it does not appear that provincial economies must become trapped in middle income once reaching the Lewis turning point.

Second, many provincial economies had per capita incomes below our estimated Lewis turning point and still had a lot of growing to do before they reached it.

Finally, our results suggest that in considering the Chinese economy, we must be careful to differentiate between regions of China as their respective economies can be very different given their respective level of development. This being the case, making judgments about how the nation of China is performing can be misleading and care has

to be taken to recognise the divergence of the sub-economies and the implications that this may have for the analysis of China and its impact on the world.

7.   Conclusion

China's economic performance and its transition from a developing through to middle and on to a high income country is of great interest to the global economic community as the future development of China will have profound effects worldwide. With the surplus of labour that is helping drive the unprecedented growth falling, growth is expected to slow. The turning point at which this may occur, the LTP, could have far-reaching consequences.

Regression analysis of the relationship between the share of traditional labour and real provincial GDP across all provinces identified that the decline in the ratio is occurring at an accelerating rate, which suggests that the slowdown leading to the LTP has yet to occur. When the data for the provinces is examined on a regional basis, it has been found that the coastal provinces, significantly more developed than the central and western provinces, have passed the LTP and moved above the middle income bracket with no issues. This suggests that in the case of China, the middle income trap may be avoided.

This paper identified the LTP to be RMB18,500 in 1998 values. Fifteen provinces were already well above this level and a further five were approaching or had just crossed this point. The remaining provinces, located primarily in the central and western regions, were well below this level and were expected to grow strongly towards it.

These findings identify how important it is to recognise that, spatially, the Chinese economy is not a homogeneous whole with very different levels of economic development across the country. Our approach permits the diversity of regional areas to be fully taken into account in estimating the stage of economic growth China, or more particularly, its respective regions, have reached.

Overwhelmingly, the past academic literature had identified that the LTP had not yet been passed by China. However, given the findings in this paper, we can conclude that the provinces that have yet to reach the LTP - primarily in the central and western regions - had masked the achievement of the coastal region which is significantly above the point identified.

The findings of this paper also concur with the academic literature which asserts that China, as a whole, will overcome the middle income trap. The provinces in the coastal area have already reached high income status - suggesting that those provinces that are yet to grow to that point will do so without becoming trapped at middle income levels.

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