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Regional economic growth in China from a Kaldorian perspective: A tale of two cities

ALEXANDRE DE PODESTÁ GOMES*

Abstract:

This paper sets out to analyse and compare the growth performances of two Chinese cities, Nanjing and Suzhou. Their growth performances have varied over time, with one city outperforming the other in some periods, and with the reverse scenario taking place in other times. In order to explain this phenomenon, this study makes use of a Kaldorian analytical framework, highlighting key notions such as demand-led growth, path-dependency, lock-in effects and inter-relatedness. It will be argued that regional economic growth is explained by the match – or otherwise – between a city's productive structure and China's national aggregate demand composition.

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China's remarkable economic performance since the late 1970s is a well-known fact, but while the country has registered astonishing economic growth rates in the past four decades, this performance presented and still presents a great regional variegation. Regional economic growth, thus, has become a central concern in academic publications (see, inter alia, Yao and Zhang, 2001; Chen and Wu, 2005). The Chinese case is especially relevant, because it can be argued that a peculiarity of China's political economy is its "unique blend of central orchestration and local devolution" (Peck and Zhang, 2013, p. 360), leading to the existence of an array of alternative regional 'models' of development within the country. Different Chinese regions produced different responses to market-oriented reforms, opening-up and decentralization of fiscal and administrative power, and local states have played a catalyst role in spurring economic growth in the country (Baum and Schevchenko, 1999; Heilmann, 2008).

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Given this background, this paper proceeds by conducting a comparative study between two Chinese cities, Nanjing and Suzhou.¹ These two cities represent two successful, yet structurally distinct, cases of economic growth in modern China. The relative economic performance of Nanjing and Suzhou have varied over time, with one city presenting superior results in one period and the other reversing the trend in other periods. What could possibly explain why one city outperforms the other in one period of time, and later the scenario is reversed? By delving into this particular comparative case study, this paper sheds light on the broader question of what explains economic growth in Chinese regions. In order to answer this question, an analytical framework of Kaldorian inspiration is employed, arguing that regional economic growth is explained by the match – or otherwise – between a city's productive structure and China's national aggregate demand composition.

This research also builds on two ongoing, China-specific, debates: primarily, on the general debate about regional economic growth in China; secondly, on the debate about the existence of distinct regional 'models' or 'patterns' of economic development in a country characterized by distinct structural formations at the regional level. On a theoretical level, the research underscores the analytical power of Kaldorian ideas in explaining regional economic growth.

This paper is organized in the following manner after this introduction. Section one presents the analytical framework to be employed in this study, inspired by the Kaldorian literature on regional economic growth. Section two delves into methodological discussions, justifying the empirical strategy of this research, case selection and period of analysis. Section three presents and discusses the relevant empirical data, following the analytical framework presented in section two. Section four concludes the paper.

1. The analytical framework

In order to analyse the growth outcomes of Nanjing and Suzhou, one must have a foundation of regional growth theories. Different growth theories can be applied for a regional growth analysis, but all of them have in common the centrality of the notion of increasing returns to scale (IRS), in one incarnation or another.² This study adopts a framework based on the Kaldorian view of economic growth (Kaldor, 1970, 1972, 1985; Setterfield, 1997, 2002; McCombie, 2002). From this perspective, growth is always demand-led, so the evolution and composition of the aggregate demand is of paramount importance. Expansions in aggregate demand have the potential to kick-start a process of economic growth that, if met with the adequate supply-side conditions, can generate continuous increases in output. In particular, manufacturing production is considered the 'engine of growth' of an economy, given its power to generate dynamic IRS and technical progress (Szirmai, 2012; Rocha, 2018). The Kaldorian view articulates the notions of demand-led growth, productivity growth (that is, advancements in technical progress), increasing returns to scale, regional competitiveness, path-dependency and lock-in effects into a coherent framework.

¹ I use here "cities" and "regions" in a general sense. For definitions and details on the institutional characteristics of geographical aggregates in China see section 2 below.

² The mainstream literature on this matter can be divided into two interrelated yet distinct strands: the new economic geography (see, *inter alia*, Krugman, 1991, 1993; Fujita et al., 1999) and the regional branch of endogenous growth theories (see, *inter alia*, Lucas, 1988; Glaeser et al., 1992; Glaeser et al., 1995; Durlauf, 1994). For critical reviews on the former, see Martin (1999) and Scott (2004). For critical reviews on the latter, see Roberts and Setterfield (2010) and Peck (2016).

Within the Kaldorian view, two concepts deserve a closer scrutiny: the Kaldor-Verdoorn Law (henceforth KV Law) and the process of circular and cumulative causation. The former encapsulates a long tradition in trying to ascribe productivity growth to changes in demand-side (instead of supply-side) factors. The initial insight can be attributed to Adam Smith and his famous statement that the extent of the market limits the process of division of labour, as acknowledged by Young (1928), Kaldor (1972), and Sylos-Labini (1983), among others. Similarly, the original Verdoorn Law holds that there exists a positive relationship between productivity growth and output growth. Independently from Verdoorn, Kaldor (1957) initially developed his technical progress function, where productivity growth is caused by the process of capital accumulation.³ Here Kaldor was in essence capturing the embodied nature of technical progress, assuming new productive knowledge is incorporated into the economy via the introduction of new capital goods, as in Kaldor and Mirrlees (1962). Hence, while in the original Verdoorn Law productivity growth is caused by output growth, in Kaldor's technical progress function it was caused by capital accumulation. The empirical literature on the matter has proceeded by attempting to bring together many of these insights.⁴ Given the aims and scope of this study – which does not seek to measure the contributions of different variables to productivity growth – the take away message here is the pivotal importance of both output growth (the size of the market) and capital accumulation in determining productivity growth.

Indeed, when formulating his ideas on economic growth, Kaldor's second growth law is often dubbed the Kaldor-Verdoorn Law: already assuming manufacturing as the 'engine of growth', it states that a higher rate of manufacturing output growth leads to higher rate of manufacturing productivity growth (Thirlwall, 1983). Recalling that (manufacturing) output growth and capital accumulation are deeply intertwined variables, the KV Law essentially captures the joint effects of both of them on productivity growth. Importantly, their joint effects entail a dynamic relationship, increasing the rate of productivity growth, and not only the productivity level (McCombie, 2002). That happens because technical progress is generated in the process, either through 'learning by doing' (Arrow, 1962) or induced technical change.

The second relevant concept, that of circular and cumulative causation, is easily understood after the explanation of the KV Law. Economic growth is initiated by demand expansions, and the mechanisms working behind the KV Law guarantee that productivity growth ensues. Robust productivity growth, in turn, enables the gain of price (in the form of lower unitary costs) and non-price (in the form of new or higher quality products) competitiveness, triggering the expansion of market demand and hence creating a circular and cumulative process (Dixon and Thirlwall, 1975; McCombie and Thirlwall, 1994). Growth, hence, is path-dependent, reinforces itself overtime, and technical change comes about endogenously.

³ Capital accumulation, mechanization, and capital intensity can be used interchangeably in this strand of the literature. In this paper capital accumulation will be used throughout. The concept is normally operationalized in empirical studies by the capital-labour ratio, as in Michl (1985) and Antenucci et al. (2020).

⁴ For instance, Michl (1985) and Antenucci et al. (2020) examine the different effects of output growth and capital accumulation in determining the growth of labour productivity. Corsi and D'Ippoliti (2013), Tridico and Pariboni (2018) and Carnevali et al. (2020) more closely follow the Sylos Labini tradition in measuring different effects on labour productivity growth. As Carnevali et al. (2020, p. 133) remind us, regarding this latter strand of the literature, "Sylos Labini's theoretical model may well be regarded as an implementation and extension of the Kaldor-Verdoorn law, where the effect of the size of the market on technical progress is one out of four determinants of labour productivity".

While much of Kaldor's thinking was focused at the national level, his ideas can easily be deployed to study regional economic growth (Kaldor, 1970; Bhattacharjea, 2010; Thirlwall, 2013). From a purely growth theoretical perspective, the key point, once we have fully appreciated the Kaldorian cumulative causation growth scheme, is how to identify a proper mechanism that articulates economic growth spatially. As the dynamic effects of IRS – apprehended by the KV Law – is the mechanism that guarantees the conversion of higher demand into higher productivity growth and competitiveness, the kind of dynamic IRS so emphasized by the Kaldorian literature must be found to be geographically localised. Indeed, part of the Kaldorian literature (see section 2) has proceeded through attempts to measure the degree of localized IRS, the regional Kaldor-Verdoorn coefficient and the validity of the KV Law at the local level. In general, the results come out largely in favour of the existence of localised IRS, in particular in the manufacturing sector.

With the empirical evidence pointing out to the localised nature of dynamic IRS, and with growth theorized as demand-led, the ability of a region to connect its specific productive structure with a common aggregate demand comes to the fore of the debate. Regions must be able to exploit the aggregate demand in order to harness the benefits of the dynamic IRS alluded to by the literature and thus foster regional economic growth. This connection is established by the region's specific productive structure, so that the goods there produced encounter robust demand.

To put this differently, theorizing regional economic growth from Kaldorian lenses requires the scholar to investigate two inter-related topics: the ultimate, demand-led, source of economic growth, and the particular productive structure of regions, responsible for realizing the opportunities of dynamic IRS made available by demand expansions. In other words, the ability of a region to take advantage of an enhanced aggregate demand will depend on the match between what the region supplies (its productive structure) and the type, or component, of the aggregate demand under expansion. It becomes clear how the interaction between supply and demand,⁵ a topic already present in Young (1928) and especially in Kaldor (1985), reveals itself at the regional level.

Therefore, the characterization of the productive structure of regions, and in particular of Nanjing and Suzhou in this study, must be elucidated. In order for the KV Law to materialize and spur technical progress, there is a need for distinct components of the productive process to be organized in a manner that renders a systemic coherence to the mechanisms presiding over technical progress and economic growth. All of the components of any given productive process (fixed capital, human capital, technology, organizational structures, and institutional arrangements) must be combined coherently in order to sustain the cumulative causation scheme. Therefore, all of these components must be inter-related (Setterfield, 1997).

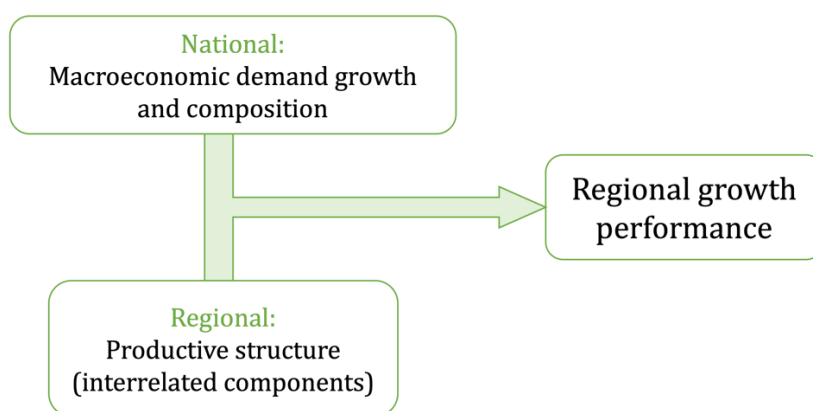
Typically, those interrelated components are established in the past and en course of economic development, i.e., they are endogenous and path-dependent, and become crystalized in the existing productive structure of any given period. They are, therefore, specific to a given productive specialization, and historically-determined. This interrelatedness among all the components ensures that a certain productive structure is relatively stable over time and is not

⁵ From our Kaldorian perspective, growth is always demand-led, but supply-side characteristics cannot be brushed away. In order to appropriately tackle regional economic growth, one must include supply-side factors, even if growth is ultimately demand-led. This assertion resonates well with part of the Kaldorian and post-Keynesian literature (Palley, 2002; Setterfield, 2003; Dutt, 2006; Skott, 2016) which aims to tackle the supply side and understand the mechanisms behind its accommodation to alterations on the demand-side.

easily affected by sudden external shocks. If on the one hand this allows a region's productive structure to be reproduced over time without major hurdles, thus generating a well-defined pattern of capital accumulation, on the other hand the risk of lock-in effects appears. When all the elements of certain productive structures become tightly interrelated, it is also difficult to upgrade this structure as a whole. The region, therefore, risks becoming locked-in to a particular, specific, productive structure (Leon-Ledesma, 2002; Setterfield, 2002). The notion of interrelatedness is fundamental for this research, because, as will be shown, Nanjing and Suzhou managed to forge productive structures that are a result of distinct, cumulative, historically-determined processes. As such, they are difficult to alter by a stroke of a pen, and there is no automatic guarantee that their productive structures are always well positioned to exploit China's evolving aggregate demand composition.

The analytical framework here proposed defends, therefore, that regional economic growth in China is determined by the appropriate match between regional structural characteristics and the national macroeconomic demand growth and composition (see figure 1). From a Kaldorian growth perspective these regional structural characteristics can be said to constitute a region's productive structure, while the aggregate demand is governed by national level variables. In other words, it is the match – or otherwise – between the local level supply and the national level aggregate demand which will dictate the prospects of regional economic growth (for a study employing a similar analytical framework, see Roberts, 2004).

Figure 1 – *The analytical framework*



2. Empirical strategy, case selection and period of analysis

There are many possible ways to conduct empirical research on the topic of regional economic growth (in China or elsewhere). Most studies linked to mainstream economics and neoclassical theory work with econometric cross-sectional studies. Likewise, most studies in the Kaldorian tradition also employ cross-sectional analyses in order to validate some of the key theoretical aspects of the literature. McCombie and de Ridder (1984) is perhaps the first study of this kind, tackling the existence of localised increasing returns at the state level in the United States between the peak years of 1963 and 1973. Bernat (1996) further expanded the

study for the period 1977-1990, incorporating spatial autocorrelation techniques. Basically, it can be postulated that productivity growth in one region will be affected by neighbouring regions' performance. Spatial autocorrelation techniques aim to deal with and control for this problem. Martinho (2011) tested the KV Law for Portuguese regions over two different periods of time, 1995-1999 and 2000-2005, with both periods presenting increasing returns for industry (although in different magnitudes), and attests that the regions exhibited spatial autocorrelation. Other studies on regions within countries include Leon-Ledesma (2000), who tested the KV Law for 17 Spanish regions; Paschaloudis and Alexiadis (2001) who tested the validity of the KV Law and found increasing returns in manufacturing for Greek regions; and Harris and Lau (1998) tested it for the UK regions and Roberts (2001) for the UK counties. Deleidi et al. (2020) studied labour productivity differentials in Italian regions, finding that, in line with the Kaldorian reasoning, labour productivity growth is subject to the positive effects of both output growth and capital accumulation. Furthermore, many studies focus on regions within the European Union (EU). Fingleton and McCombie (1998) tested the KV Law for 178 EU regions, Angeriz et al. (2008) for 59 EU regions, and Postiglione et al. (2017) for 187 EU regions. The last study incorporated measures of sample heterogeneity, dividing the regions into four spatial clusters of productivity.

Finally, it is important to notice that the majority of the studies from a Kaldorian perspective applied to China adopts the typical econometric cross-sectional approach: both Hansen and Zhang (1996) and Wang (2009) adopt cross-provincial regressions, validating Kaldor's growth laws and the role of manufacturing as the 'engine of growth' in the country, while McCombie et al. (2018) use cross-city regressions for the Jiangsu province, validating the KV Law in its dynamic specification for the province.

While this empirical strategy is commendable if one primarily seeks generalization of the main findings, it has the downside of overlooking the specificities of each region. When scrutinizing regional growth in China, this study carries out a comparative case study in order to assess what explains regional economic growth in Nanjing and Suzhou. This strategy intends to shed light on individual case studies, emphasizing their particularities and exploring the richness of their details and specific history. In order to do so, it relies on descriptive statistics, based mainly on data collected from the Jiangsu Provincial Bureau of Statistics (JSBS) and the National Bureau of Statistics (NBS), and on the review of secondary literature specific to Suzhou and Nanjing. While not common, this more qualitative, longitudinal approach is not a new approach within this theoretical tradition. Argyrous and Bambergy (2009) offer an important contribution in this regard, presenting a specific case study of regional growth in Australia in which the role of demand in triggering the typical endogenous and path-dependent process of cumulative causation is highlighted.

This study promotes a comparison between Nanjing and Suzhou, two cities located in one of the most affluent areas in China, Southern Jiangsu.⁶ Before explaining the reasons why these two cities were selected, a note on the geographical unit of analysis employed in this study is due: the term 'regional' is often used with not enough clarity in the literature on regional economic growth. It can refer to provinces, states, macro-regions, counties, or metropolitan areas. In this empirical study, 'regional' is defined as referring to cities, more specifically, the

⁶ Jiangsu is considered one of the wealthiest provinces in China. Southern Jiangsu holds the richest cities in the province. According to the Jiangsu Statistical Bureau, since the year 2000 Southern Jiangsu has been composed of five different cities: Nanjing, Suzhou, Wuxi, Changzhou, and Zhenjiang.

prefecture-level cities of Nanjing and Suzhou.⁷ On a theoretical level, this entails the assumption that the effects of the dynamic IRS emphasized by the Kaldorian literature is mostly confined to these units of analysis.

Nanjing and Suzhou were selected because, despite their geographical proximity and relatively similar status as wealthy cities, they exhibit very distinct productive structures and different and oscillating growth performances throughout the post-1978 period. While in some periods Suzhou outperforms Nanjing, in other periods the reverse is the case. Hence, it is not possible to pin down which city possesses an unambiguously 'superior model' of development. The objective is to illustrate the existence of alternative regional models within the same country, avoiding the 'one size fits all' type of verdict. Whether or not one city displays a relatively superior economic performance depends ultimately on broader considerations, in particular – following demand-led growth notions – the evolution of the country's aggregate demand composition, and its match with the city's productive structure.⁸

The data analysis will focus on the 2001-2015 period. This timeframe was decided for a series of reasons. Firstly, it starts in the year China joined the World Trade Organization (WTO), representing a major national-level institutional change, affecting the economic possibilities of the whole country. Secondly, the period 2001-2015 can be neatly divided into two sub-periods of roughly similar length: considering the 2008 global financial crisis (GFC) as a major watershed, one can consider a pre-GFC period, roughly from 2001 to 2008, and a post-GFC period, roughly from 2009 to 2015. As will be shown in the empirical analysis, the GFC seems to have provoked far-reaching changes in the composition of China's aggregate demand, and this subdivision will be employed in analysing the growth performances of both cities. Thirdly, data availability at the local level is restricted for the pre-2001 period, creating obstacles which are difficult to overcome.

⁷ China has a multi-layered governance system, and the sub-national scale encompasses at least four distinct political-administrative divisions: provincial, prefectural, county, and township levels. The post-1978 programme of reform and opening-up led to a number of interrelated phenomena in terms of urban administrative restructuring. In particular, one may highlight the rise of prefecture-level cities as a new level of governance in modern China. They became entitled to administer not only the 'city proper', but also the surrounding suburban counties and county-level cities. Under this system commonly known as 'city-leading-county' (*shì guǎn xiàn*), prefecture-level cities have gained greater administrative and economic powers, and are responsible for the area-wide planning and urban-rural integration, take full responsibility for developing urban districts, and are entitled to extract fiscal resources which otherwise would be accrued by their subordinate units. Not surprisingly, a lively body of literature delving into the city level as a privileged unit of analysis when scrutinizing economic development and comparative studies between different cities has emerged (see, *inter alia*, Chung, 1999; and Wu et al., 2007).

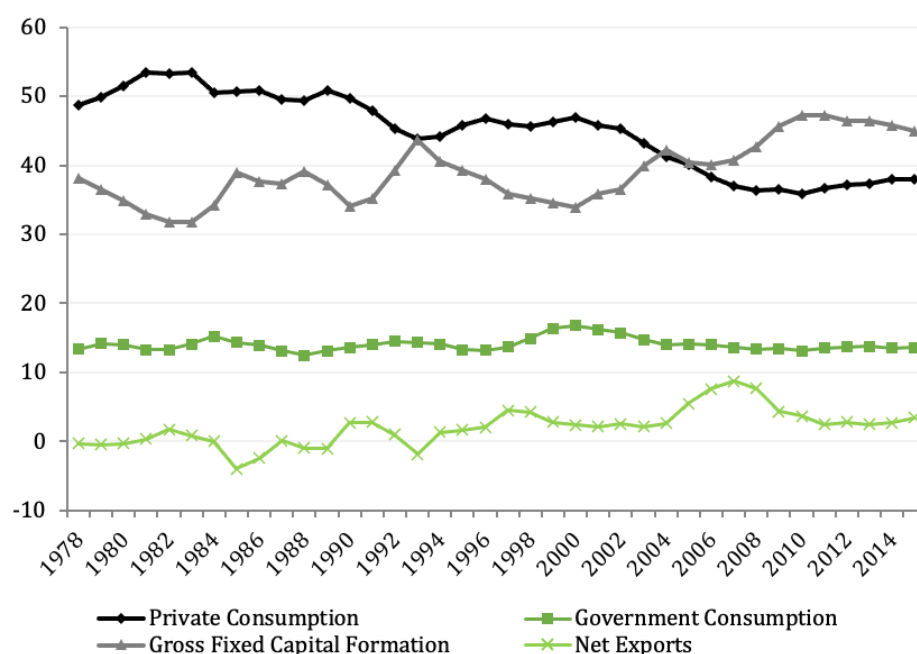
⁸ A comparison between a rich city and a poor city, therefore, was consciously avoided, because this sort of contrast would not conform to the objectives of this study. This type of comparison would inevitably lead to simplistic assessments such as the dichotomy between a 'successful' versus an 'unsuccessful' case. In this case, the study would not be able to emphasize the existence of alternative local 'models' of economic growth within the Chinese territory, as the productive structure of an 'unsuccessful' case, from the onset, would have to be considered ill-fated and ineffective in relation to the other, and the derived policy implications would dangerously be drifted to the 'one size fits all' type of recommendations. For this study to avoid this type of simplistic assessment, the selected case studies should be able to indicate that different regional productive structures can both be successful in terms of economic growth.

3. Empirical analysis

3.1. China's changing aggregate demand composition, 2001-2015

When analysing China's GDP from the expenditure approach (figure 2), it becomes clear that the country's impressive economic growth in the post-1978 period has been associated with a rise of investments (gross fixed capital formation) as a share of GDP, especially after 2000, and an almost continual decrease of private consumption as GDP share (at least until 2008). In addition, it is also worth looking at the behaviour of external demand (net exports). Often alluded to as having an 'export-led' growth model, China actually registered an erratic trajectory for its net exports until the mid-1990s, recording even negative figures on some occasions. It is only with the WTO accession in 2001 that the country started to experience hefty trade surpluses, but after the 2008 Great Financial Crisis (GFC) a sudden fall ensued. From the Kaldorian perspective employed here, the existence of massive trade surpluses in the run-up to the crisis represents an unrivalled source of economic dynamism, which can be exploited by different localities to distinct degrees, in accordance with their productive structure. Conversely, the post-2008 fall in net exports also represents a sudden loss of economic dynamism, especially for locations that were able to take advantage of the earlier moment.

Figure 2 – China's GDP: Expenditure approach (1978-2015), percentages



Source: based on data from NBS (2016).

The international environment following the GFC registered more timid rates of international trade expansion and outward productive foreign direct investments. According to Donnan and Leahy (2016), before the GFC international trade grew at as much as twice the

rate of global output, but after 2011 trade growth rates were equal to or below the growth rate of the global economy. China, in particular, not only suffered from a less robust external demand for its production, but also from a decrease in foreign investments in fixed assets. For example, between 2007 and 2015 the share of foreign investments in China's total investments in fixed assets was more than halved.⁹

From a macroeconomic perspective, investments are the main component of Chinese aggregate demand since 2004, as seen in figure 2. Therefore, it seems justifiable to affirm that the post-GFC environment has been translated into a higher domestic orientation of the Chinese economy, at least in terms of macro-level demand and sources of investments. External demand and foreign investments continue to play an important role in China's economic growth, but a diminished one in relation to the period between the WTO accession and the GFC.

While the changes in the macro demand composition shown above are telling, they are still very broad. Investments, as indicated, are a major component. One may, hence, attempt to disentangle which sub-sectors within the broad category of gross fixed capital formation (investments) have grown the most throughout the whole period of analysis, and in the different sub-periods. Hence, here the growth rates of each Chinese manufacturing sector will be analysed.¹⁰ The objective is to present the manufacturing sectors which have grown the most nationally, therefore indicating that the demand for goods from these sectors was expanding.

During the first period,¹¹ 2003-2009, the fastest growing manufacturing sector is Computers, communications and other electronic equipment manufacturing, registering a growth rate of 142.7%. The following sectors include lower added-value sectors, such as the Manufacture of furniture (growth rate of 127.1%) and the Processing of timber, manufacture of wood, bamboo, rattan, palm, and straw products (growth rate of 104.7%), metallurgy (Manufacture of metal products), chemicals (Manufacture of rubber and plastic products), and electronics (Manufacture of electrical machinery and equipment).

The second period, 2009-2015, presents a very distinct composition, as well as growth rates. To start with, the manufacturing sector as a whole diminished its growth impetus, registering substantially lower growth rates. The leading sector now is the Manufacture of articles for culture, education and sport activity (growth rate of 91.6%), followed by the Manufacture of pharmaceuticals (growth rate of 43.6%) and the Manufacture of beverages (growth rate of 40.2%). The manufacturing of Computers, communications and other electronic equipment only appears in fourth place, registering a growth rate of 37.0% this time. The top three growing sectors seem to be less traditional (in comparison to chemicals and metallurgy) and more domestic-oriented. Pharmaceuticals, in particular, are posited to experience a large growth as China's burgeoning middle-class and rapidly-aging society may create an enlarged demand for the sector. Interestingly enough, some manufacturing sectors experienced negative growth rates. For instance, traditional sectors, like the Manufacture of rubber and plastics products, which was the 7th fastest growing sector in the first period, fell

⁹ See the appendix (figure A1) for the relevant data on this matter.

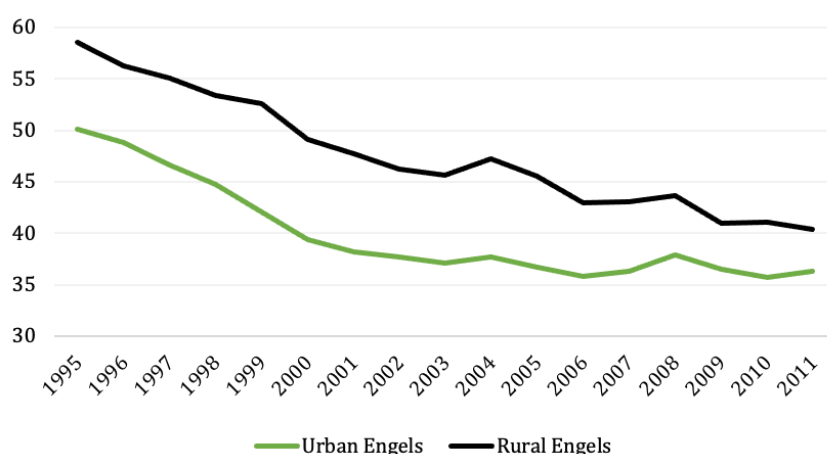
¹⁰ In total, there are 28 manufacturing sectors. The appendix (tables A1 and A2) shows the complete list of sectors, organized from the fastest to the slowest growing sector.

¹¹ 2009 is considered the watershed year, and appears in both periods, first as the end point in the pre-GFC period, and later as the initial point in the post-GFC period. Both periods encompass seven years of analysis, therefore. The decision to choose 2009 as the turning point in the analysis, instead of 2008 (normally associated with the GFC) is due to the impacts of the GFC in China's external trade: 2008 still registers a relatively high trade surplus (7.64% of GDP), and it is only in 2009 that a substantially lower series of values starts (4.34%).

by 5.1% in the second period. Overall, China's manufacturing seems to be moving towards less traditional, more diversified and perhaps higher value-added sectors.

This trend may be said to parallel the country's changing consumption composition as well. China's aggregate consumption seems to be moving towards more sophisticated goods, so that the share of basic consumption goods decreases over time. The Engels coefficient, which measures the share of food expenditure as a proportion of total household spending, may be a useful indicator to illustrate this discussion. If the coefficient decreases over time, as figure 3 shows for China, the most likely interpretation is that the country is going through a process of structural change with households increasingly spending proportionally less in food (and on less sophisticated items) and conversely spending more in higher value-added goods.

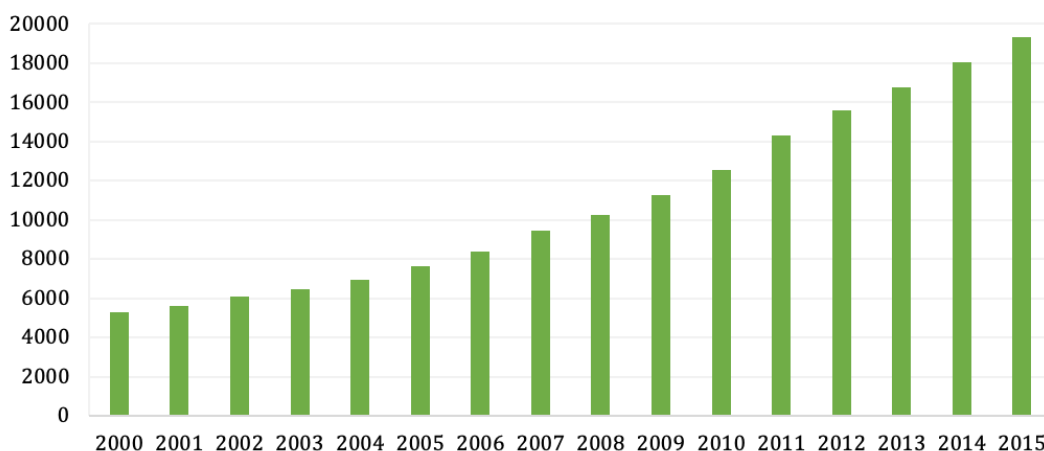
Figure 3 – Urban and rural Engels coefficient (1995-2011), percentage points



Source: NBS (2012).

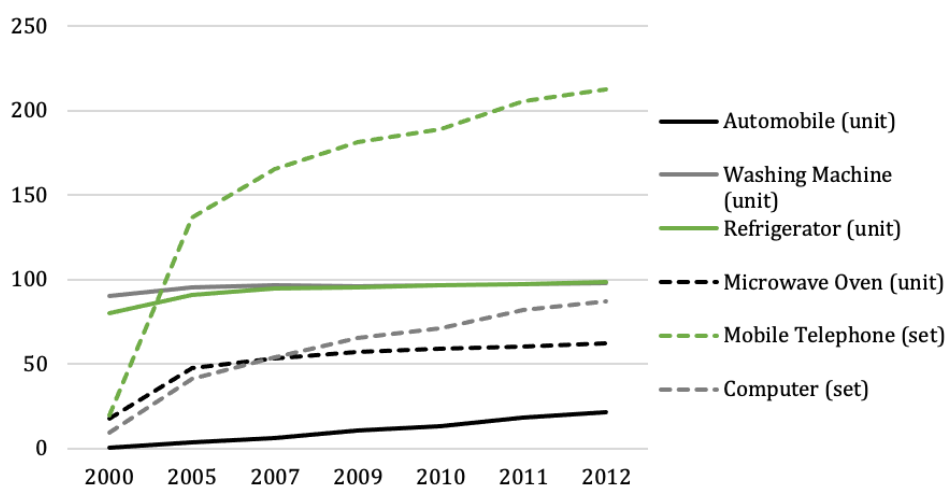
Indeed, the consumption of 'modern' durable goods has spread throughout China, revealing the creation and development of a mass consumption society. As Chinese economic growth has unfolded, the typical Western consumption pattern based on the acquisition of main durable goods such as automobiles, home appliances, and white goods has occurred throughout the country. This means household consumption and China's domestic market increasingly serve as a source of reliable demand for producers. Figure 4 depicts the growth in China's consumption expenditure per household in real terms, while figure 5 depicts the trends for the consumption of selected main durable goods. It is important to highlight the rise in the consumption of automobiles, from 0.5 units per 100 urban households in 2000 to 21.54 in 2012. While this rise is proportionally less impressive than other goods (especially mobile phones), one must bear in mind that the unitary cost of an automobile is of greater magnitude than the other consumption goods, representing a more sizeable unitary impact.

Figure 4 – China's average household consumption expenditure (2000-2015), yuan, 2015 prices



Source: based on data from NBS (2016). Data deflated using China's CPI (from the same source).

Figure 5 – Possession of selected main durable consumption goods per 100 urban households (2000-2012)

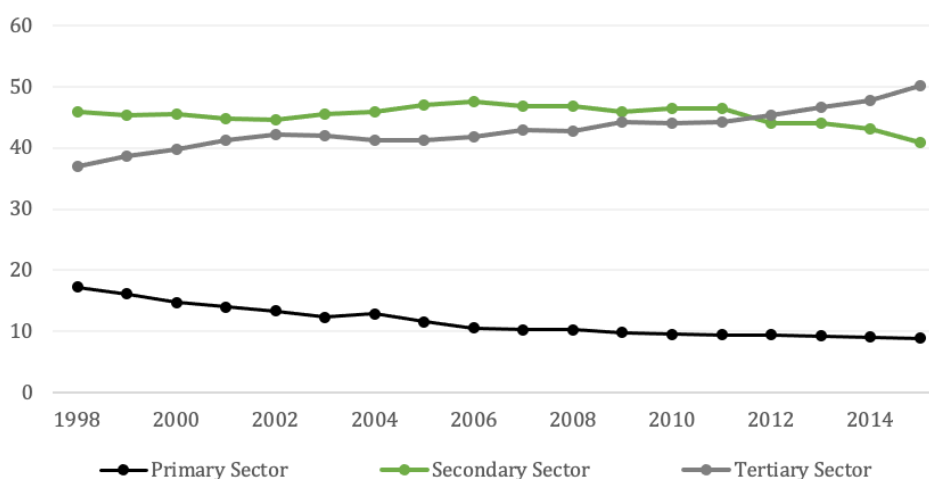


Source: based on data from NBS (various years).

Finally, and in spite of the main focus here on manufacturing, it is important to highlight the growing importance of the service sector for the Chinese economy. As figure 6 reveals, the services output as a share of the GDP has been continuously increasing, overtaking the secondary sector in 2012 as the leading sector in the Chinese economy. This movement is associated with the rise of Chinese income per capita and living standards. As the country grows richer, more people are able to afford more expensive products after having met their immediate consumption needs. Indeed, Kroeber (2016) indicates that since 2010 the share of the Chinese population which earns more than USD 20,000 a year is growing faster than any

other social stratum in the country. These are the people who are able to spend in advanced services, like healthcare, education,¹² tourism,¹³ and financial services.

Figure 6 – *China's GDP by sector (1998-2015), percentages*



Source: based on data from NBS (2016).

In sum, during the first period (2001-2008), prior to the GFC, China enjoyed a higher external demand for its products, as can be attested by the large trade surpluses registered just before the GFC. Investments as a share of the GDP were on the rise, and consumption falling. Accordingly, the top growing manufacturing sector in this period was a heavily export-oriented one, Computers, communications and other electronic equipment manufacturing (the export-orientation of this sector in China will be discussed in section 3.2). The following top growing sectors included some traditional areas like metallurgy (Manufacture of metal products), chemicals (Manufacture of rubber and plastic products), and lower added-value sectors (Processing of timber, manufacture of wood, bamboo, rattan, palm, and straw products).

The second period, post-GFC, registered a clear fall in external demand, as attested by the fall of trade surpluses from 2009 onwards. Moreover, while investments continued increasing as a share of GDP until 2011, consumption halted its decline and experienced a slight increase, from 35.9% of GDP in 2010 to 38.1% in 2015. The loss of external dynamism was also felt in the sources of investments in fixed assets, which became increasingly domestic-oriented. Meanwhile, Chinese consumption patterns seem to have moved from a more traditional pattern, centred on basic goods, to a more sophisticated one. The generalization of a mass consumption society, at least among urbanites, is clearly on the way. In tandem with the process of structural change China is undergoing, the service sector overtook the secondary sector in 2012, helped by a rising middle-class. The top-growing manufacturing sectors reflect these trends, with more sophisticated and domestic-oriented sectors like the Manufacture of

¹² The total number of enrolments for the regular undergraduate increased from 5,561 thousand people in 2000 to 26,253 thousand people in 2015, representing an increase of 4.72 times (NBS, 2016: table 21-8).

¹³ China's total expenditure in domestic tourism, measured in 2015 prices, jumped from 450,130.8 million yuan in 2000 to 3,419,510 million yuan in 2015, representing an increase of roughly 7.6 times (NBS, 2016: table 17-10). Data deflated by China's national Consumer Price Index (CPI).

articles for culture, education and sport activity, and the Manufacture of pharmaceuticals, leading the list.

3.2. Nanjing and Suzhou local productive structures

3.2.1. Historical background and productive structure characteristics

Both cities are relatively wealthy and have been the subject of many scholarly debates and, despite their geographical proximity, they can be characterized by very different social, political and economic features. At the onset of the reform and opening-up paradigm in 1978 Suzhou was a small city at the outskirts of Shanghai, characterized by small-scale, low-technology collectively-owned enterprises (COEs), and did not have a strong and well-established industrial base (Chung, 2003). In the 1980s the local government, taking advantage of the newly gained increased autonomy over economic development, spurred a process of rural industrialization and relied on the growth of its COEs and township and village enterprises (TVEs). This plan of action, often encapsulated under the banner of the “Sunan model”, presented exceptional results in the 1980s, but the deficiencies of TVEs – normally light industries based on small-scale production and low technology – eventually forced the city to reshape its strategy (Wang et al., 2015).

The national privatization and further opening-up drive of the 1990s was used by the local leadership to attract foreign direct investments (FDI), especially in the information and communication technologies (ICT) sector. At this time, global production networks (GPNs) were undergoing a process of global restructuring, with firms seeking to relocate towards areas featuring cost advantages. Suzhou received an especially large influx of FDI from Taiwanese firms concentrated in the ICT sector, which were seeking sites featuring low labour costs to be used as export-platforms (Wang and Lee, 2007). By the turn of the century, Suzhou had completely been transformed from the canonical “Sunan model” based on domestic-invested COEs, to having an export-oriented strategy based on foreign capital.

Suzhou’s strategy ultimately translated into a strong engagement with foreign capital and export markets, leading to a higher concentration of investments in economic sectors which enjoyed robust external demand. The type of FDI prevailing in Suzhou was primarily lured by the city’s lower labour costs and other cost advantages (such as cheaper land prices and proximity to ports). Indeed, recent surveys of the ICT sector in the city conducted by Wei (2010, 2015a) confirm that transnational corporations (TNCs) in Suzhou are overwhelmingly export-oriented (81.8% of the surveyed firms are involved in exports), seek primarily lower labour costs (it ranks first among all the factors in determining locational investments of ICT firms) and are established mostly in the form of wholly foreign-owned enterprises (only 4.5% of the companies surveyed were Sino-foreign joint-ventures, henceforth JVs). The poorer educational standards and the lack of labour training and skills upgrading institutions, in comparison with Nanjing and other neighbouring cities such as Shanghai and Hangzhou (Wang et al., 2015), left the city without much else to offer to TNCs. These characteristics seriously undermine the city’s ability to take advantage of knowledge spillovers from TNCs (Chen, 2014; Wei, 2015a), thus translating into a weak base of high-tech indigenous companies.

Nanjing, on the other hand, presents a very distinct productive structure. As the provincial capital of Jiangsu, it is still deeply influenced by its inheritances from the Maoist era. Back then,

the city had become home to a great number of large-scale state-owned enterprises (SOEs) and received a large inflow of central investments, especially in heavy industries like chemicals and metal-mechanics (Wang et al., 2011). During the 1980s, the city relied mostly on its inherited industrial base, and did not promote a significant program of TVE-based rural industrialization to the same extent as Suzhou did (Chung, 2003).

In the 1990s, amid the process of restructuring of GPNs and further opening-up, the city also started to attract foreign capital. However, this movement was more timid in relation to Suzhou, and Nanjing's reliance on its strong base of SOEs and its prior economic development led the city to a relatively slower opening-up and a more modest engagement with external markets (Chung, 2003; Wei, 2015b). Moreover, the type of FDI attracted seemed to come from a more diversified array of countries and sectors, and often was brought in the form of JVs with domestic companies (state-owned or private). Importantly, as the city has historically been characterized by higher average wages in comparison to Suzhou, the type of FDI seeking low labour costs as a primary factor in its locational decision has tended to favour Suzhou rather than Nanjing (Wei, 2010; 2015a). Furthermore, Nanjing is characterized by a more sizeable higher education and research sectors, a more developed services sector than Suzhou, and a more diversified economy. Its software sector, for instance, was China's third largest by revenue in 2010, only behind Beijing and Shenzhen (Klibaner et al. 2014).

These structural characteristics are illustrated and complemented by evidence brought about by sectorial studies. Zeng and Bathelt (2011), for instance, shed light on the Nanjing Chemical Industrial Park (CIP). Given Nanjing's legacies, the CIP was already dominated by SOEs and was oriented towards China's domestic market. As such, Zeng and Bathelt (2011) aptly noticed that the CIP's goals "did not include a vision that went beyond national borders" (p. 688), and much of the FDI the CIP attracted from the late 1990s onwards came in the form of JVs between TNCs and SOEs. Perhaps the most important illustration of this model is the JV between the Yangtze Petrochemical Co (YPC), a subsidiary of Sinopec, and the German corporation BASF. The BASF-YPC joint-venture, according to Zeng and Bathelt (2011), "produced exclusively for the Chinese market and did not engage in export activities" (p. 689). In 2014, BASF announced a 60% increase in its CIP production capacity, in order to meet the growing demand of China (BASF, 2014). In another sector, home appliances, the study by Wei et al. (2010) revealed that the American company A.O. Smith has decided to establish product development and marketing facilities for the Chinese market in Nanjing in order to cater to the specificities of Chinese consumer needs. These examples attest to Nanjing's orientation towards the Chinese domestic market and a more diversified industrial base.

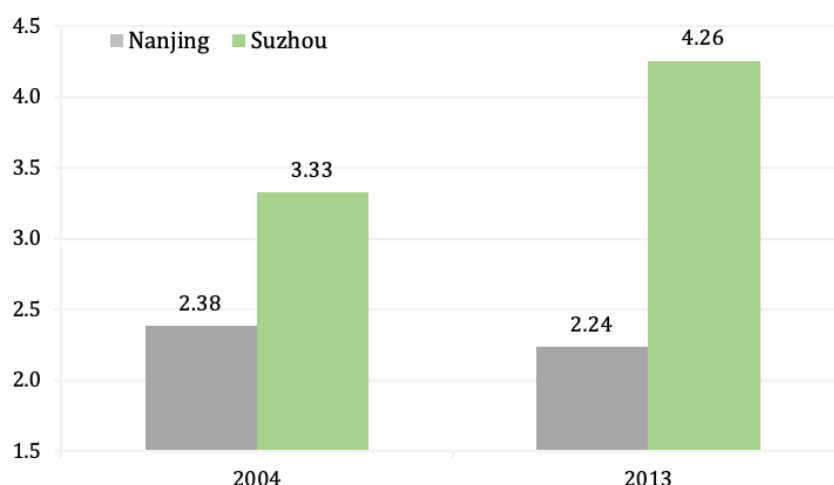
3.2.2. Productive structure: indicators

Three sets of indicators can gauge with more precision some of the key aspects of the productive structures of Nanjing and Suzhou. In particular, the manufacturing sector of each city will be scrutinized here with the objective to understand their most important sectors, and how they are connected with the most relevant manufacturing sectors under expansion at the national level.

Firstly, the size of the leading manufacturing sectors in each city will be assessed. Nanjing and Suzhou both have the same sector, Computers, communications and other electronic equipment manufacturing, as their leading manufacturing sector. The relative specialization

index¹⁴ based on this sector is presented in figure 7. The higher the value of the index, the higher the output specialization in the sector.

Figure 7 – *Relative specialization index of the leading manufacturing sector: Nanjing and Suzhou (2004 and 2013)*



Source: adapted from Gomes (2020).

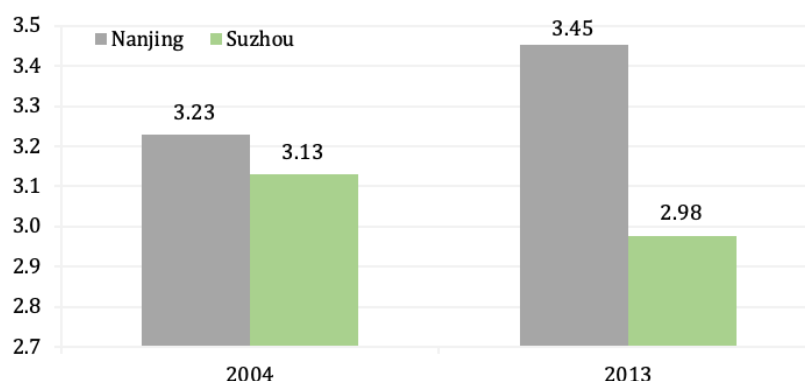
Suzhou, as expected, presents the highest index for the sector, given its strong attraction of ICT companies. While the term ICT does not appear in the official Chinese classification, it is plausible to assume that Computers, communications and other electronic equipment manufacturing is the closest in meaning and in products manufactured with the idea of an ICT sector.¹⁵ In addition, Suzhou's specialization index increases over time, indicating an increasing specialization in this sector. Nanjing, on the other hand, experienced a decline from 2004 to 2013. The data reveals that Suzhou is more dependent on the ICT sector than Nanjing. The latter also has an important base of ICT companies (it is its leading sector after all), but is not so reliant on them.

Secondly, after analysing the degree of specialization of each city's leading manufacturing sector, we shall turn to the degree of diversification of their respective manufacturing sectors. Statistically, it is possible that a city may be highly specialized when considering its leading sector but also highly diversified when considering all the sectors (in other words, the specialization index is not necessarily the mirror image of diversification index). Figure 8 below shows the relative diversification index¹⁶ for the two cities, at two different points in time. If economic activity in the city under consideration is fully concentrated in one single sector, the index equals 1, and the index increases as activities in the city become more diverse.

¹⁴ See the online appendix for the relevant methodological notes on the relative specialization index.

¹⁵ I refer to Zuppo (2012) for a discussion on the possible definitions and usages of the term ICT.

¹⁶ See the online appendix for the relevant methodological notes on the relative diversification index.

Figure 8 – *Relative diversification index: Nanjing and Suzhou (2004 and 2013)*

Source: adapted from Gomes (2020).

The data reveals that Nanjing presents a more diversified industrial structure, in both periods of time. This data confirms the general historical description presented previously. Moreover, the gap between Nanjing and Suzhou grew between 2004 and 2013, as the former became more diversified and the latter less diversified.

Thirdly, a complementary approach is to exhibit the specialization indexes for the national top-growing manufacturing sectors discussed in section 3.1. This strategy has a high level of relevance for this study, because, following the analytical framework in section one, growth is always demand-led. Therefore, it is interesting to take the national top-growing manufacturing sectors identified before and analyse to which degree these sectors are represented in Nanjing and Suzhou's productive structure. This allows us to determine whether a region is well positioned to take advantage of the expansion of certain components (sectors) of the aggregate demand or not. Tables 1 and 2, therefore, show the relative specialization indexes of Nanjing and Suzhou for the seven fastest growing manufacturing sectors nationally.¹⁷ Table 1 considers the first period of analysis, 2003-2009, and table 2 considers the second period of analysis, 2009-2015.

Table 1 – *Relative specialization index: Nanjing and Suzhou (2004)*

Manufacturing sectors with the highest employment growth, 2003-2009	Nanjing	Suzhou
Manufacture of Communication Equipment, Computers and Other Electronic Equipment	2.38	3.33
Manufacture of Furniture	0.20	1.24
Processing of Timber, Manufacture of Wood, Bamboo, Rattan, Palm, and Straw Products	0.10	0.56
Manufacture of Electrical Machinery and Equipment	0.81	1.03
Manufacture of Metal Products	0.63	0.89
Processing of Food from Agricultural Products	0.35	0.46
Manufacture of Rubber and Plastics Products	0.58	1.02

Source: based on data from NBS (2005) and JSBS (2004).

¹⁷ the full list, reported in the appendix (tables A1 and A2), contains 28 manufacturing sectors. The seven sectors displayed in tables 1 and 2 represent, therefore, the top 25th percentile of the list.

Table 1 takes data for the year 2004 as representative of the 2003-2009 period. It becomes clear that, for all sectors presented, Suzhou has higher relative specialization indexes than Nanjing. In some cases, the difference among the cities is very pronounced, as is the case of the Manufacture of furniture, for instance (Suzhou's index is six times higher than Nanjing's). This data leads to reckon that Suzhou was more apt to exploit China's aggregate demand composition during this period.

Table 2 takes data for the year 2013 as representative of the 2009-2015 period. Here the scenario is almost perfectly reversed: Nanjing presents higher relative specialization indexes than Suzhou for all the sectors under scrutiny, with the exception of the fourth in the ranking. Hence, while during the first period the national top growing manufacturing sectors were overwhelmingly represented in Suzhou's productive structure, for the second period the top growing sectors were solidly represented in Nanjing's productive structure. One is led to assume that Nanjing was more able to exploit China's aggregate demand composition during this second period.

Table 2 – *Relative specialization indexes, Nanjing and Suzhou (2013)*

Manufacturing sectors with the highest employment growth, 2009-2015	Nanjing	Suzhou
Manufacture of Articles for Culture, Education and Sport Activity	1.03	0.81
Manufacture of Medicines	0.62	0.30
Manufacture of Beverages	0.25	0.09
Manufacture of Communication Equipment, Computers and Other Electronic Equipment	2.24	4.26
Manufacture of Transport Equipment	0.90	0.26
Manufacture of Foods	0.54	0.32
Processing of Food from Agricultural Products	0.34	0.26

Source: based on data from NBS (2014) and JSBS (2014).

In sum, Nanjing's productive structure can be regarded as more diversified, less dependent on the ICT sector, less reliant on FDI and exports, and more geared towards domestic demand. Suzhou's productive structure is less diversified and more dependent on the ICT sector, more reliant on FDI and external markets.

3.3. Growth performances: Nanjing and Suzhou, 2001-2015

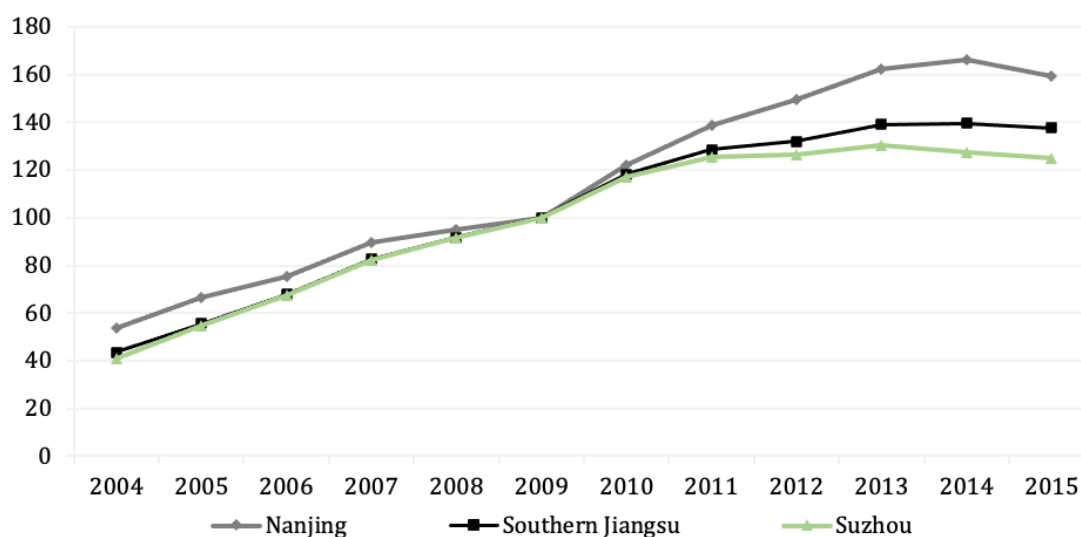
After analysing China's evolving aggregate demand composition (section 3.1), and Nanjing and Suzhou's respective productive structures (section 3.2), it is justifiable to believe that during the first period (2001-2009) Suzhou's growth performance was probably favoured by China's booming exports and the massive importance of the ICT sector. Crucially, China's top growing manufacturing sectors during the first period were well-represented in Suzhou's productive structure. During the second period of our analysis (2009-2015), however,

Nanjing's growth prospects could have been favoured by China's enhanced domestic demand, vis-à-vis the diminished weight of external demand in the country's aggregate demand. Remarkably, China's top growing manufacturing sectors during this period were now better represented in Nanjing's productive structure.

Considering these circumstances for Nanjing and Suzhou, one may now look at the data relating to economic growth outcomes for both cities. Following the Kaldorian approach to economic growth presented in section two, one should always remember that growth is theorized as demand-led. A robust growth of demand will trigger higher production. A higher output production is believed to trigger a higher productivity growth, via the KV Law. Higher productivity and technical progress in the most dynamic sector of the economy (thought to be the manufacturing sector) will spill over to the rest of the economy, triggering a rise in productivity for the whole economy and thence, due to increased competitiveness, higher demand. As the region meets this increased demand with expanded domestic production, the Kaldorian process of circular and cumulative causation is completed, and growth reinforces itself.

With the changing composition of the Chinese aggregate demand scrutinized before, one would expect to see these shifts impacting the manufacturing output of Nanjing and Suzhou. Figure 9 below depicts the manufacturing gross output, with the year 2009 set as base (value 100) in order to allow better visualization of the changes after 2009¹⁸.

Figure 9 – Gross manufacturing output (2009 = 100): Nanjing, Suzhou, and Southern Jiangsu (2004-2015)



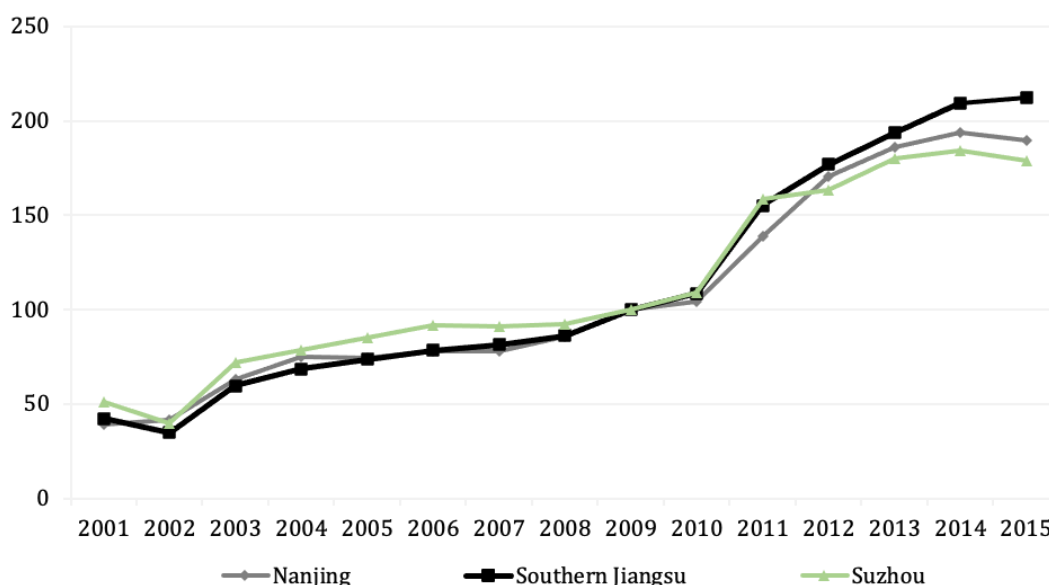
Source: based on data from JSBS (various years). Before converting the data to the 2009 base, the output data was deflated using Jiangsu's province CPI (2015 prices).

¹⁸ This and the following figures include data for the average of Southern Jiangsu, in order to indicate how Nanjing and Suzhou perform in relation to the broader geographical region they belong to.

As expected, Nanjing presented higher manufacturing output growth¹⁹ during the second period of analysis (2009-2015), while Suzhou presented better figures during the first period (2001-2009). The data confirms the prediction made before, based on the premise that the Chinese aggregate demand composition of the first period matched Suzhou's productive structure better than Nanjing's productive structure, while after 2009 the scenario is reversed. A city enjoying higher demand for its goods is more likely to expand production, in order to exploit the existing demand.

Following enhanced manufacturing output, one would expect to see a higher growth rate of technical progress, via the KV Law. It should also be noted that for Kaldor (1972) technical progress and capital accumulation cannot be easily disentangled, as there is a bi-causality mechanism between them: both are at the same time cause and consequence of each other. The joint effects of extended markets (higher output) and capital accumulation (higher capital-labour ratio) enable the exploitation of dynamic IRS and leads to labour productivity growth. Figure 10 shows the data for capital accumulation, here proxied by the capital-labour ratio.

Figure 10 – *Capital-labour ratio (2009 = 100): Nanjing, Suzhou, and Southern Jiangsu (2001-2015)*



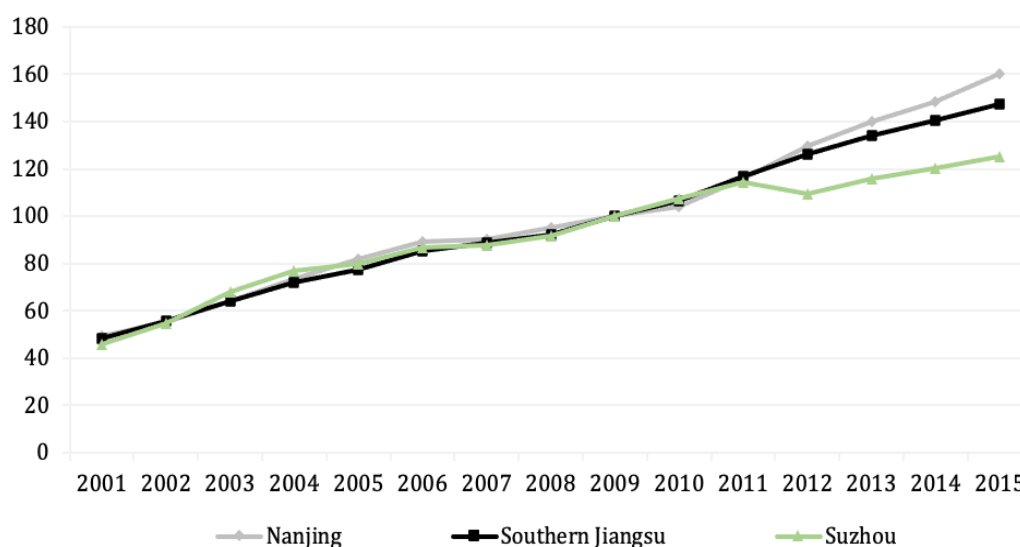
Source: based on data from JSBS (various years). Before converting the data to the 2009 base, the capital-labour ratio data was deflated using Jiangsu's province CPI (2015 prices).

For both manufacturing output and capital-labour ratio, Nanjing presented faster growth rates, as expected, during the second period. Capital accumulation is both a cause and consequence of economic growth. A higher demand and production will enable an economy to accumulate more knowledge (here shown solely in the form of embodied capital), and the KV Law guarantees that faster technical progress will follow from an increased output production.

¹⁹ In the appendix (figure A2), data for industrial output can be found. Note that the industrial data presents the same pattern observed for the manufacturing data, thus reinforcing the conclusions of this study.

Suzhou displays faster manufacturing output growth during the first period, but the scenario is reversed after 2009. It should be noted, however, that for the capital-labour ratio Nanjing grows faster than Suzhou in both periods, revealing the more capital-intensive nature of its productive structure vis-à-vis Suzhou's more labour-intensive structure. Capital accumulation and technical progress are interwoven, and they also spark economic growth. Hence, higher (lower) numbers in figures 9 and 10 are expected to be matched by higher (lower) total labour productivity growth (due to inter-sectorial spillover effects). Figure 11 depicts the outcomes for total labour productivity.²⁰

Figure 11 – Total labour productivity (2009 = 100): Nanjing, Suzhou, and Southern Jiangsu (2001-2015)

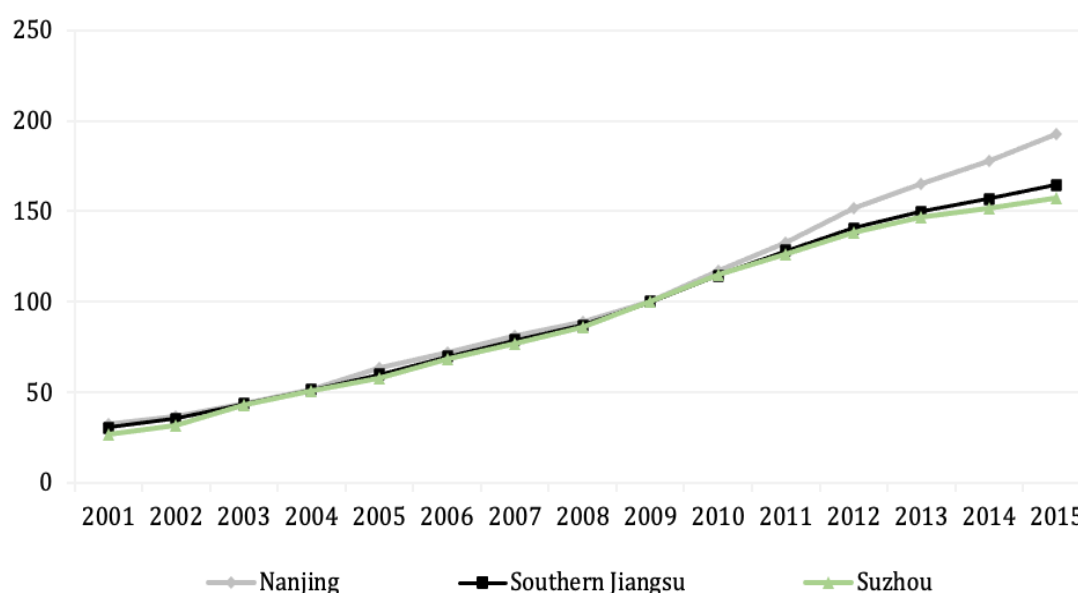


Source: based on data from JSBS (various years). Before converting the data to the 2009 base, the total labour productivity data was deflated using Jiangsu's province CPI (2015 prices).

Again, the theoretically-informed prediction is borne out by the data. During the first period (2001-2009), when Suzhou enjoyed higher demand for its production, the city also recorded higher manufacturing output growth, and now one can notice a higher total labour productivity growth in the same period as well. Nanjing presents inferior results for this period, but after 2009 records a superior performance in all the indicators under scrutiny. A higher labour productivity is anticipated to be translated into both cost and non-cost competitiveness gains, entailing accelerated GDP growth rates. The data for GDP growth, presented in figure 12, closes the empirical analysis.

²⁰ In the appendix (figure A3), data for the secondary sector labour productivity can be found. Note that the secondary sector labour productivity data presents the same pattern observed for the total labour productivity data, thus reinforcing the conclusions of this study.

Figure 12 – Gross domestic product (2009 = 100): Nanjing, Suzhou, and Southern Jiangsu (2001-2015)



Source: based on data from JSBS (various years). Before converting the data to the 2009 base, the output data was deflated using Jiangsu's province CPI (2015 prices).

As anticipated, Suzhou records faster economic growth between 2001 and 2009, but after that Nanjing takes the lead. Tables 3 summarizes the statistical data for all the indicators presented, displaying the compound annual growth rates for each subperiod. It should be noted that the table also includes the data for industrial gross output and the secondary sector labour productivity, which are consistent with all the other indicators under scrutiny.

Table 3 – Compound annual growth rates: Nanjing and Suzhou (2001-2009 and 2009-2015)

	Manufacturing gross output		Industrial gross output		Capital-labour ratio		Secondary sector labour productivity		Total labour productivity		Gross domestic product (GDP)	
	Nanjing	Suzhou	Nanjing	Suzhou	Nanjing	Suzhou	Nanjing	Suzhou	Nanjing	Suzhou	Nanjing	Suzhou
2001-2009*	16.83%	25.09%	15.00%	18.73%	12.45%	8.69%	6.10%	8.65%	9.26%	10.19%	15.21%	17.82%
2009-2015	8.11%	3.79%	9.62%	4.14%	11.22%	10.17%	8.62%	-0.25%	8.14%	3.79%	11.55%	7.82%

Source: based on data from JSBS (various years).

Notes: data for manufacturing gross output starts in 2004, not in 2001.

Suzhou presents superior figures for all the six indicators during 2001-2009, but for 2009-2015 the situation is fully reversed, with Nanjing leading in all indicators.²¹ It is important to highlight the cumulative nature of the growth cycles presented here: once a city's superior

²¹ Again, the only exception is the capital-labour ratio, with Nanjing presenting faster growth rates in both periods. As mentioned before, this might be due to the city's structurally more capital-intensive technology of production.

growth performance is set in motion, it tends to reproduce itself over time. That was the case for Suzhou until 2009 and Nanjing after that, creating two very clear and distinct periods for economic growth analysis, with the year 2009 as a watershed. But if growth is circular and cumulative, one must spell out why Suzhou interrupted its superior growth trajectory back in 2009. The explanation, as already hinted at, is centred on China's macro-demand composition shift: the GFC represented a staggering external shock for the Chinese economy, and localities which built their productive structure primarily on the strength of external demand and foreign capital suffered the most. Moreover, there were already important domestic changes slowly taking place in China, with the rise of a burgeoning middle-class and a rapidly-aging society representing an enlarged demand for some sectors which Nanjing was more suited to exploit.

4. Conclusions

This paper set out to understand what explains regional economic growth in two successful yet structurally very distinct cities in contemporary China. In order to do so, an analytical framework of Kaldorian inspiration was employed. In particular, the process of circular and cumulative causation was emphasized, highlighting the primacy of the national level aggregate demand in kick-starting the process of economic growth. As this study is concerned with regional economic growth, the productive structure of each region was given special importance as well.

It was argued that Suzhou's productive structure – more labour-intensive, export-oriented, less diversified and based on the ICT sector specialization – was better positioned to exploit China's aggregate demand composition during the period 2001-2009. Conversely, Nanjing – whose productive structure is more diversified, more domestic-oriented and less reliant on the ICT sector and on low labour costs – was better positioned to exploit the shifts in China's aggregate demand composition during the period 2009-2015. The data presented showed that, indeed, Suzhou outperformed Nanjing in the first period, but in the second period the scenario was fully reversed.

This study has shown that one cannot establish which regional 'model' is unambiguously superior. In fact, whether or not one region outperforms the other is contingent on broader conditions, namely, the evolution of China's national aggregate demand. This conclusion runs against the idea of the existence of a set of 'best practices' to be adopted throughout the country in a one size fits all fashion. Indeed, one may even argue that these two regional models are actually complementary from a national perspective. The existence of different regional models within the same country can be a strength because the likelihood of a city being ready to exploit a new aggregate demand composition is always higher than in a more homogeneous country.

The relative growth performances of Nanjing and Suzhou during the 2001-2015 period illuminates crucial aspects that are part and parcel of the analytical framework presented. Path-dependency, a concept dear to the Kaldorian approach, revealed its full thrust in this study. The analysis of Nanjing and Suzhou unveils the historically-determined, path-dependent process of building and reproducing their productive structures over time. Moreover, the current inferior economic performance of Suzhou may also highlight another theoretical aspect: lock-in effects. The productive structure forged in Suzhou seems to be mismatched with

China's current demand composition, weakening the causal mechanisms within the cumulative causation schema. The practical results are much lower growth performances. The inferior performance, then, becomes hard to reverse: without a robust demand, productivity and technical progress growth are undermined and the region enters a phase of relative decline.

These two characteristics – path dependency and lock-in effects – governing regional economic growth, make it challenging for any policy adviser to offer simple solutions for local leaders. The basic policy recommendation for Suzhou derived from this study is that the city must be able to change some of its structural characteristics to tap into the new demand composition. However, the inter-relatedness among different components of the productive process makes the whole productive structure of the region difficult to alter, and therefore sound policy advice may be met with unsurmountable barriers when attempting to implement it.

Nanjing's productive structure, on the other hand, seems to be better suited to China's current demand composition. The city has been able to diversify its economy among distinct sectors (including services), and also headquarters large domestic companies like Panda (electronics manufacturer), Suning (retail sector²²) and Yurun Group (food processing²³), which are all well-positioned to exploit China's booming consumer market. The current match between Nanjing's productive structure and China's composition of aggregate demand, however, cannot be assumed to be eternal, and may be disrupted in the future.

The contribution of this study to the existing knowledge on the topic is two-fold: firstly, this study is, to the best of the author's knowledge, the first to apply a Kaldorian analytical framework in a qualitative and longitudinal comparative case study setting in China. Secondly, and following from the first contribution, this research strengthens the academic knowledge about Nanjing and Suzhou, in their own right. While many studies on these two cities surely exist (and were acknowledged in section three), this research has illuminated the productive structure and growth performances of both cities from a new, theoretically-informed, perspective.

In spite of these contributions, this research is not without its own limitations. Firstly, some pertinent aspects on regional economic growth were overlooked. For example, transportation costs, a variable dear to the new economic geography literature, was left behind. This was due to the theoretical approach privileged in this study, which normally neglects this variable. Secondly, some empirical concerns may be raised related to the geographical unit of analysis chosen for this study. For instance, it may be claimed that spillover effects and other externalities emanating from different cities may affect the growth performances of Nanjing and Suzhou. While this concern is valid, the ability to absorb spillover effects is still city-specific and may be a function of the productive structures presented. Subsequent studies may also incorporate a larger sample and spatial autocorrelation techniques to deal with this issue.

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²² Considered to be China's largest private company by revenue in 2013 (Klibaner et al., 2014).

²³ Considered to be China's largest supplier of processed meat.

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Appendix

Table A1 – *Growth rates of China's manufacturing sectors (2003-2009)*

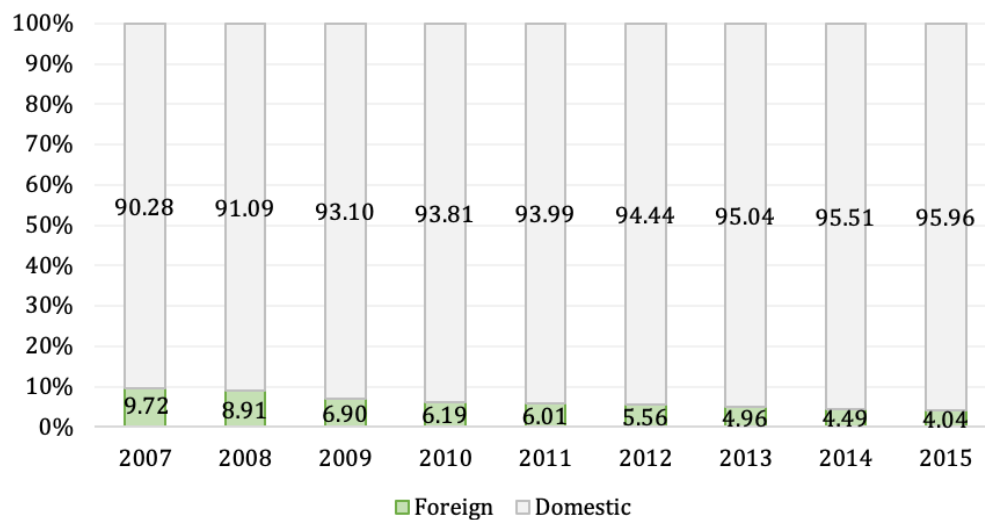
	Growth rate	Rank
Manufacture of Communication Equipment, Computers and Other Electronic Equipment	142.68%	1
Manufacture of Furniture	127.15%	2
Processing of Timber, Manufacture of Wood, Bamboo, Rattan, Palm, and Straw Products	104.72%	3
Manufacture of Electrical Machinery and Equipment	101.80%	4
Manufacture of Metal Products	86.47%	5
Processing of Food from Agricultural Products	85.87%	6
Manufacture of Rubber and Plastics Products	76.12%	7
Manufacture of General-Purpose Machinery	71.62%	8
Smelting and Pressing of Non-ferrous Metals	66.64%	9
Manufacture of Foods	60.98%	10
Manufacture of Transport Equipment	59.84%	11
Manufacture of Measuring Instruments and Machinery for Cultural Activity and Office Work	56.49%	12
Manufacture of Leather, Fur, Feather and Related Products	55.75%	13
Manufacture of Textile Wearing Apparel, Footwear, and Caps	55.37%	14
Manufacture of Special Purpose Machinery	50.62%	15
Processing of Petroleum, Coking, Processing of Nuclear Fuel	42.39%	16
Manufacture of Raw Chemical Materials and Chemical Products	41.49%	17
Manufacture of Articles for Culture, Education and Sport Activity	40.42%	18
Manufacture of Medicines	39.06%	19
Printing, Reproduction of Recording Media	38.24%	20
Manufacture of Paper and Paper Products	33.95%	21
Manufacture of Beverages	33.73%	22
Manufacture of Artwork and Other Manufacturing	32.55%	23
Manufacture of Non-metallic Mineral Products	28.44%	24
Smelting and Pressing of Ferrous Metals	26.22%	25
Manufacture of Textile	23.62%	26
Manufacture of Chemical Fibers	21.13%	27
Manufacture of Tobacco	-5.61%	28

Source: based on data from NBS (2004; 2010).

Table A2 – Growth rates of China's manufacturing sectors (2009-2015)

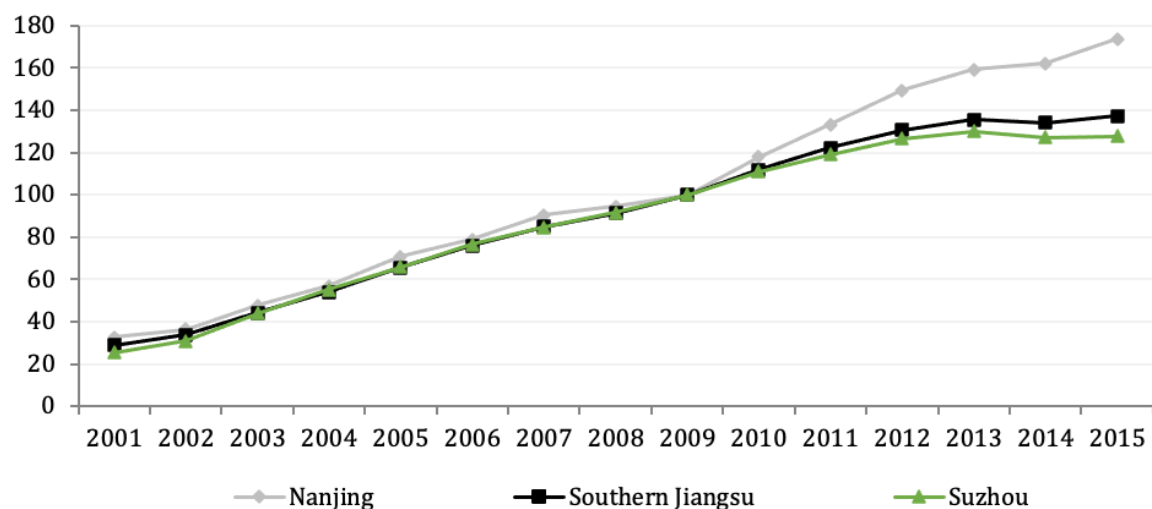
	Growth rate	Rank
Manufacture of Articles for Culture, Education and Sport Activity	91.64%	1
Manufacture of Medicines	43.62%	2
Manufacture of Beverages	40.16%	3
Manufacture of Communication Equipment, Computers and Other Electronic Equipment	37.01%	4
Manufacture of Transport Equipment	32.95%	5
Manufacture of Foods	30.33%	6
Processing of Food from Agricultural Products	25.79%	7
Manufacture of Furniture	21.83%	8
Printing, Reproduction of Recording Media	19.41%	9
Manufacture of Metal Products	19.26%	10
Manufacture of Electrical Machinery and Equipment	17.73%	11
Manufacture of Non-metallic Mineral Products	15.91%	12
Manufacture of Special Purpose Machinery	14.51%	13
Manufacture of Leather, Fur, Feather and Related Products	14.12%	14
Smelting and Pressing of Non-ferrous Metals	13.95%	15
Smelting and Pressing of Ferrous Metals	12.97%	16
Manufacture of Chemical Fibers	12.55%	17
Manufacture of Raw Chemical Materials and Chemical Products	11.70%	18
Processing of Petroleum, Coking, Processing of Nuclear Fuel	9.82%	19
Processing of Timber, Manufacture of Wood, Bamboo, Rattan, Palm, and Straw Products	7.74%	20
Manufacture of Tobacco	4.29%	21
Manufacture of Textile Wearing Apparel, Footwear, and Caps	0.04%	22
Manufacture of General Purpose Machinery	-3.13%	23
Manufacture of Rubber and Plastics Products	-5.06%	24
Manufacture of Measuring Instruments and Machinery for Cultural Activity and Office Work	-6.55%	25
Manufacture of Paper and Paper Products	-11.59%	26
Manufacture of Textile	-24.73%	27
Manufacture of Artwork and Other Manufacturing	-68.75%	28

Source: based on data from NBS (2010; 2016).

Figure A1 – *China's investments in fixed assets, domestic and foreign shares (2007-2015)*

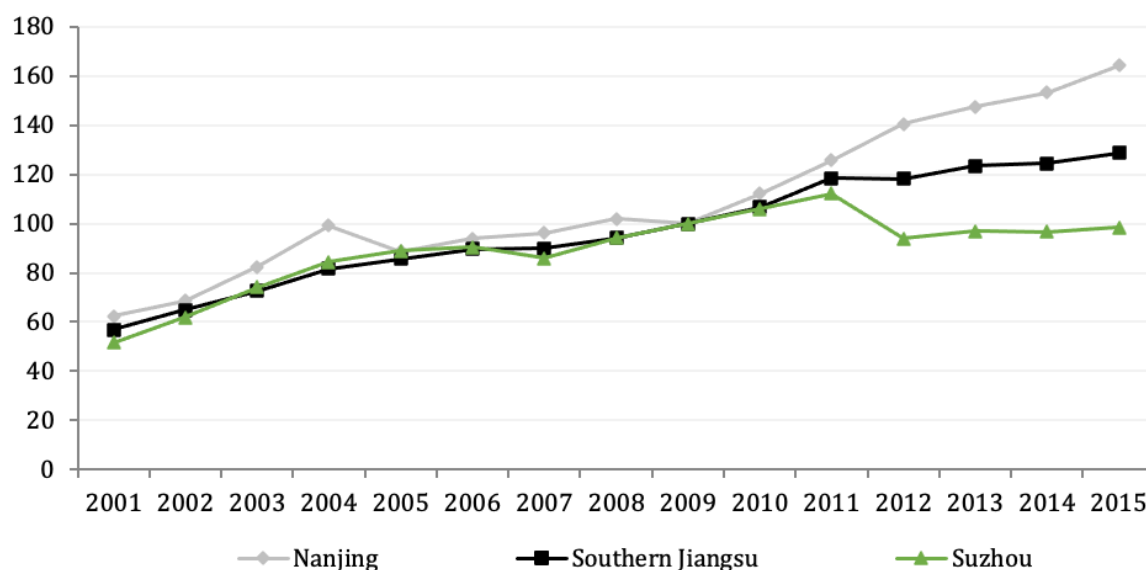
Source: based on data from NBS (various years).

In the following graphs, data on industrial output and secondary sector labour productivity are presented, to complement the data presented in the main text. Note that, according to the NBS, the secondary sector is composed of industry and construction. The former can be further sub-divided into three groups: manufacturing, mining and utilities.

Figure A2 – *Industrial output (2009 = 100): Nanjing, Suzhou, and Southern Jiangsu (2001-2015)*

Source: based on data from JSBS (various years). Before converting the data to the 2009 base, the output data was deflated using Jiangsu's province CPI (2015 prices).

Figure A3 – *Labour productivity, secondary sector (2009 = 100): Nanjing, Suzhou, and Southern Jiangsu (2001-2015)*



Source: based on data from JSBS (various years). Before converting the data to the 2009 base, the secondary sector labour productivity data was deflated using Jiangsu's province CPI (2015 prices).

While table 3, in the main text, presents the compound *annual* growth rates for each subperiod, table C1 below presents the total growth rates between the final year-end observation and the initial year-end observation for each subperiod:

Table A3 – *Growth rates for main economic performance indicators: Nanjing and Suzhou (2001-2009 and 2009-2015)*

Indicator	Manufacturing gross output		Industrial gross output		Capital-Labour Ratio		2nd Sector Labour Productivity		Total Labour Productivity		Gross Product Domestic (GDP)	
Period/City	Nanjing	Suzhou	Nanjing	Suzhou	Nanjing	Suzhou	Nanjing	Suzhou	Nanjing	Suzhou	Nanjing	Suzhou
2001-2009*	86.31%	144.86%	205.89%	294.80%	155.74%	94.74%	60.56%	94.18%	103.06%	117.29%	210.46%	271.21%
2009-2015	59.65%	25.04%	73.53%	27.58%	89.32%	78.76%	64.26%	-1.48%	59.96%	24.99%	92.68%	57.12%

Source: based on data from JSBS (various years).

*Data for manufacturing gross output starts in 2004, not in 2001.

Labour productivity is calculated by dividing the total output (in 2015 prices) by the total number of workers in any given period. The capital-labour ratio is calculated by dividing the total investments in urban fixed assets (2015 prices) by the total number of workers in any given period.