

Chinese Green Job Guarantee: *A Roadmap for Sustainable Prosperity*

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Abstract: This paper proposes a centrally funded and locally administered Chinese Green Job Guarantee to achieve three goals. First, to eliminate China's 24.27 million urban unemployment by providing a public job to anyone willing, able, and ready to work. Second, to achieve public purposes (building infrastructure, addressing environmental degradation, and preserving traditional culture, etc.) by hiring the previously unemployed 24.27 million Chinese workers. Third, to promote organic economic growth with the increased consumption from the 24.27 million JG workers. Increasing China's fiscal deficit by 1.58% of 2019 GDP would have financed a complete Chinese Green JG to eliminate the 24.27 million people experiencing urban unemployment and elevate GDP growth rate to the 9.23% and 10.65% range in 2019. Moreover, China's deficit spending to finance the Green JG is not only sustainable but also functional. Finally, the paper explores the design of a Chinese Green JG, such as how it should be administered, what jobs it could create, and why China should adopt a gradualist approach.

Keywords: Chinese economy, unemployment, national debt, government deficit, job guarantee, employer of last resort, sustainable development

JEL codes: J680, H630, H620, J580, B5, E6

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Introduction

The primary purpose and contribution of this essay is to propose a tailored Green Job Guarantee program (hereafter Green JG) for the Chinese economy to coordinate economic growth, employment, structural adjustments, and environmental sustainability. I first demonstrate that a Job Guarantee program is far more effective in creating jobs than the conventional macroeconomic policies that indirectly create jobs by stimulating economic growth. I then explain why China would especially benefit from a Green JG and why China's time to implement it is ripe. Afterwards, I show that a Chinese Green JG is affordable. Increasing China's fiscal deficit by 1.58% of 2019 GDP would have financed a complete Chinese Green JG to eliminate China's the 24.27 million urban individuals currently unemployment and elevate China's GDP growth rate to the 9.23% and 10.65% range in 2019. Combined with the many other benefits of a green and fully employed economy, such as economic, social, and political stabilities and environmental sustainability, a Chinese Green JG is well worth it. Moreover, since a Green JG entails increased deficit spending, I examine the sustainability and functionality of Chinese government deficits (and government deficits in general) by constructing and examining sector balances for three representative countries – China, the U.S., and Greece. My conclusion is that China's deficit spending to finance the Green JG is not only sustainable but also functional. Finally, I explore the design of a Chinese Green JG, such as how it should be administered, what jobs it could create, and why China should adopt a gradualist approach in order to implement it.

I divide the essay into five sections. Section I introduces what a Job Guarantee is. I explain its advantages against the conventional tools of addressing unemployment. Section II explains why China would especially benefit from a Green JG. I investigate four major changes and challenges that have pressured China's economic growth and employment in recent years. I then show how a Chinese Green JG promotes China's economic growth and full employment while enhancing the Chinese state's ability to tackle each of these four changes and challenges. In section III, I explain why China's time to implement a Green JG is ripe. In section IV, I estimate the economic benefits and costs of a full-fledged Chinese Green JG. In section V, I inquire into the sustainability and functionality of China's deficit spending. In section VI, I discuss the design of a Chinese Green JG and summarize my key findings in the conclusion section.

I. What is a Job Guarantee?

A Job Guarantee (JG) or Employer of Last Resort (ELR) is a publicly funded and locally administered employment program to 1) eliminate unemployment in a market economy by offering a job to anyone willing, able, and ready to work and 2) achieve public purposes by creating these jobs in appropriate fields (such as infrastructure, environmental service, and cultural heritage programs, etc.). It is a different public policy approach advocated by many to address unemployment (Minsky 1986, Forstater 2003, Wray 2004, Fullwiler 2005, and Kaboub 2007, etc.). Conventional macroeconomic policies – fiscal and monetary – aim to indirectly create jobs by stimulating economic growth. The problem, however, is that labor-displacing technical change (i.e. the machine process, robotics, and automation) is a structural trend that continues to undermine the causality from economic growth to job growth.¹ The result is that economic stimulus policies generate jobless growth (Ricardo 1911, Forstater 2000). In comparison, a JG offers an unorthodox but logical solution to unemployment: eliminate joblessness by directly creating jobs. Then, these new jobs not only achieve public purposes (such as reforestation to address desertification) but also contribute to the growth of the market economy as the JG workers' wages translate into consumer spending, business sales, revenue, profits, and investments. Hence, while conventional economic stimulus policies indirectly create jobs by promoting economic growth, a JG program creates jobs first, which then organically generates economic growth.

The above logical difference between conventional macroeconomic policies and the Job Guarantee program has important implications regarding the quantitative relationship between China's GDP growth rate and unemployment rate. Chinese Premier Li Keqiang was clear when he discussed the purpose of China's economic growth, "the reason we care about GDP is because we care about employment stability" (Li 2013). However, his calculations expressed concerns about the effectiveness of stimulating GDP growth to create jobs, as he said in 2013, "In the past, each one percent of China's GDP growth can create employment opportunities for 1 million Chinese. With the economy's structural adjustments, especially with the accelerating growth of the service sector, now [in 2013] each one percentage of China's GDP growth can create 1.3 or even 1.5 million jobs" (Li 2013). This means that even if we assume that 1% GDP growth generates 1.5 million more jobs, China's GDP would have needed to grow for an additional 16% to eliminate its 24 million urban unemployment figure in 2019. This unrealistic requirement precisely demonstrates the difficulty of translating GDP growth to job growth using conventional economic stimulus policies in a world that is increasingly automated and capital-intensive.

If, however, we aim to create jobs directly and let economic growth become a residual, my calculation in section IV shows that a complete Chinese Green JG (assuming an average JG wage of 3700 RMB per month) will eliminate China's 24.27 million urban unemployment while

¹ Some argue that historically we have seen manufacturing jobs replacing agricultural jobs and service jobs replacing manufacturing jobs. The problem, however, is that services jobs are now themselves being lost to the machine process, which begs the question, "where do we go from now?"

generating an additional 3.13% to 4.55% GDP growth in 2019. This means that to employ the same 24 million urban people currently unemployed in China in 2019, a JG approach now “requires”² the GDP to grow for only 3.13% - 4.55% more, as opposed to the 16% more as calculated before. The discrepancy reflects the fundamental advantage a JG program has over conventional macroeconomic stimulus policies – conventional economic stimulus policies only indirectly create jobs by promoting economic growth whereas a JG program creates jobs first, which then organically generates economic growth. Hence, echoing the importance of stabilizing employment, a JG approach is undoubtedly the more viable choice for China. In a nutshell, the “job growth creates GDP growth” is functional whereas the “GDP growth creates job growth” is inefficient and often contradictory to environmental and structural adjustments goals.

Not only are conventional macroeconomic policies ineffective at promoting employment, so are the conventional tools of education and training/retraining. Keynes’s principle of effective demand argues that unemployment is a structural defect in a capitalist market economy because the firms’ profit-maximizing level of output generally does not coincide with the full employment level of output (Keynes 1936). This means that though training and education are important, they cannot alone explain aggregate unemployment. An individual’s hard work, education, and training may lead him/her to a job. But that only changes the composition of unemployment without altering joblessness in the aggregate level. As Forstater, Kaboub, and Kelsay explain Harvey’s (2001) parable of dogs and bones:

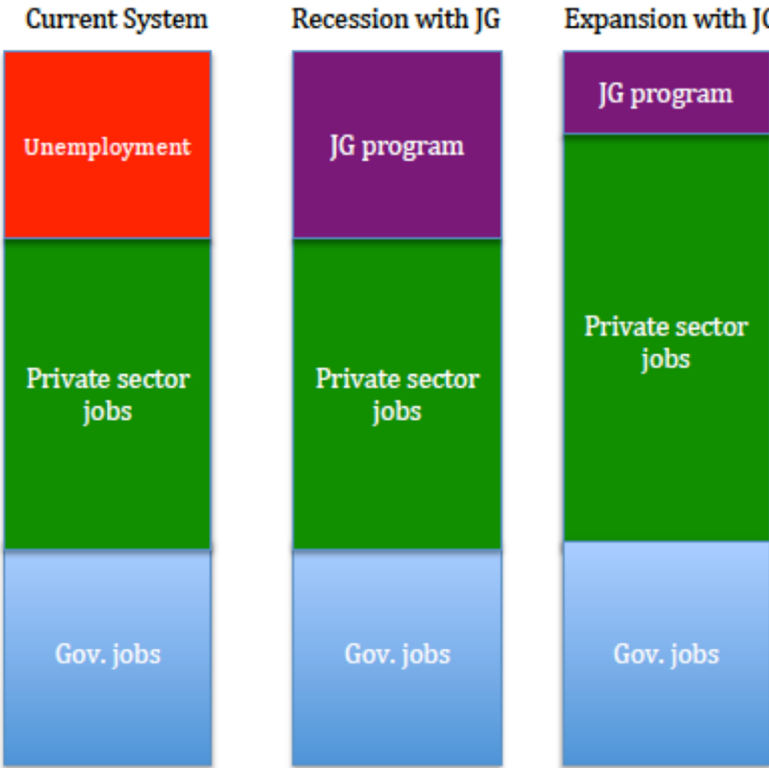
Suppose there are 100 dogs on an island. Every day a plane flies over and drops 95 bones on the island. At least five dogs will be boneless, and perhaps more, as it is possible that some dogs could get more than one bone. We say the boneless dogs do not have enough motivation or have underdeveloped muscles or in other ways lack ability as bone gatherers. We take the boneless dogs aside and train them and put them through various exercises to improve their abilities. The next time the plane flies over and drops 95 bones, some of those who received training may obtain a bone. But as long as we do not increase the total number of bones, at least five dogs will remain boneless. Training and education and other human capital traits may, in part, determine which workers will get jobs and which will not, but for everyone to find employment we need to increase the aggregate number of positions. Full employment requires that there are at least as many job vacancies as people needing work (Forstater, Kaboub, and Kelsay 2015)

Hence, the Job Guarantee is an innovative policy response to the failures of conventional macroeconomic policies and education and training programs in achieving and maintaining full employment in a market economy.

² “Require” may not be the precise word, since GDP growth is a consequence of job creation in a JG, not a cause as in conventional economic tools.

Another important advantage of a JG program, when compared to conventional macroeconomic policies, is that it reduces policy instability and uncertainty. This is because a JG program is an institutionalized countercyclical automatic stabilizer to manage the macroeconomy. When the market economy slows down, the market sector (including both privately-owned businesses and the State-owned Enterprises) will release workers into the JG program to produce more publicly desirable goods (such as environmental service, cultural heritage preservation programs, and other quality-of-life enhancing works). When the market economy expands, workers will be incentivized by the higher wages offered by the private sector to re-enter market employment and produce more market goods. A JG program thus complements the market, rather than replacing it. A JG program therefore not only *achieves* full employment at a point in time but also *maintains* full employment through time (Forstater 2000). Employment fluctuations during the business cycles are shown as below³:

Figure 5: The Job Guarantee Approach to Full Employment



Source: Forstater, Kaboub, and Kelsay (2015).

³ Figure taken from “The Cost of Unemployment and the Job Guarantee Alternative in Saudi Arabia,” by Mathew Forstater, Fadhel Kaboub, and Michael Kelsay in 2015.

Moreover, JG programs are generally affordable, especially for countries with monetary sovereignty. Numerous researches have demonstrated the financial affordability of a JG for a variety of countries, including the U.S., Australia, Tunisia, India, Saudi Arabia, and even Greece (Mitchell and Watts 1997, Gordon 1997, Kitson, Michie, and Sutherland 1997, Fullwiler 2003, Kaboub 2007, Forstater, Kaboub, and Kelsey 2015). In this paper, I demonstrate that even the most conservative estimates of the benefits of a Chinese Green JG by far outweigh the costs of implementing it. I also show that the fiscal deficit needed to finance a Chinese Green JG is not only sustainable but also functional to stabilize Chinese private sector balance sheets.

Note that the benefits of a JG are enormous precisely due to the tremendous economic and social costs of unemployment for the macroeconomy, individuals, households, communities, and the nation state. Macroeconomically, unemployment entails a loss of potential GDP should the unemployed remain unable to contribute to production. Individually, unemployment presents substantial economic and psychological hardship that threatens one's material provisioning and mental health. Socially, unemployment is discouraging and detrimental to cultivate social trust and harmony. For the nation state, unemployment generates social and political instabilities that could result in populism⁴.

A final introductory note about the JG concerns its applications in the real world. While a variety of countries (such as the United States, Sweden, Australia, Argentina, and India, etc.) have experimented JG in some forms, the design and implementation of their job creation programs have been partial and incomplete. Even when a program was clearly functioning well, it could still be discontinued, as evidenced by the American New Deal after WWII. The most important factors that have constrained the development of JG worldwide are not economical but rather political and ideological. This is because even though JG is complementary to market economy, it is a socialist public policy in nature that entails changes that may undermine the power position of the capitalists. As such, it faces strong political and ideological oppositions in countries that follow the path of a capitalist market economy that ideologically promotes laissez-faire policies. Kalecki, for instance, was skeptical that such a program, granting full employment, would be possible given its likely politically undesirable reception in a capitalist society. He notes that a full employment capitalism entails essential social and institutional changes:

‘Full employment capitalism’ will, of course, have to develop new social and political institutions which will reflect the increased power of the working class. If capitalism can adjust itself to full employment, a fundamental reform will have been incorporated in it. If not, it will show itself an outmoded system which must be scrapped (Kalecki 1943)

Hence, various forms of JG have only been adopted in these countries when unemployment issues became too acute. China, on the other hand, is in a unique position to use JG as a mean to an end due to the Chinese state's pragmatic and developmental role in shaping China's socialist market

⁴ As seen in the U.S., Taiwan, and Hong Kong, etc. in recent years.

economy, as I elaborated in my first essay, *Transformation, not Transition: A Critical Survey of China's Political Economy*.

In this section, I have introduced what a Job Guarantee is. The main takeaways are as follows: First, conventional macroeconomic policies are inefficient at creating jobs by stimulating economic growth, due to labor-displacing technical change. A Job Guarantee, on the other hand, is more effective in stabilizing employment because it directly creates jobs, which then organically promotes economic growth. Second, JG reduces policy instability because it is a countercyclical macroeconomic stabilizer that automatically expands during economic downturns and contracts during economic booms. Third, JG complements, rather than replaces, the market economy.

II. Why China Needs a Green JG

Besides the already mentioned benefits of a JG in the previous section, I argue that China would especially benefit from a Green JG because it has the potential to help the Chinese economy coordinate economic growth, employment, structural adjustments, and environmental sustainability. I first identify four major changes and challenges that have pressured China's economic growth and employment in recent years. I then show how a Chinese Green JG promotes China's economic growth and full employment while enhancing the Chinese state's ability to tackle each of these four changes and challenges.

The Job Guarantee component of a Green JG addresses China's economic growth and employment concerns that have resulted from the several changes and challenges in recent years. These changes and challenges are domestic, international, structural, and technical. Domestically, the Supply-Side Structural Reform⁵ (SSSR), while necessary to reduce excessive capacity, address pollution, and upgrade China's industry, inevitably put downward pressure on the Chinese economy in the short and medium term. Internationally, Trump's initiation of the trade war against China in 2018 (which has been accompanied with technology war, currency war, and media war, etc.) has pressured China's economic growth through the exports channel. Structurally, China's population growth slowdown due to urbanization presents a serious long-term challenge for the Chinese economy to transition from export-led to domestic consumption-led. Finally, in the technical dimension, the Chinese state's macroeconomic policy in the last few years had preferred corporate tax cuts and monetary policies to direct government spending, which reduced the effectiveness of budget deficits.⁶

I argue that the Job Guarantee component of my Green JG proposal effectively addresses China's economic growth and employment concerns while enhancing the Chinese state's ability to tackle each of these changes and challenges. First, the JG program not only supports the SSSR by creating employment opportunities to counteract the unemployment pressure from reducing excess

⁵ The SSSR was officially announced by President Xi in late 2015.

⁶ However, there has been a reversal in 2019 and 2020, as infrastructure investment was reinvigorated under Li Keqiang's leadership.

capacity. It also enriches the SSSR by increasing shortage capacity (such as the Chinese economy's ability to perform environmental service, preserve and disseminate Chinese traditional culture, and other quality-of-life-enhancing works). This is because the types of jobs created through the JG depend on the need of the Chinese economy. Therefore, a Chinese Green JG program does not create excess capacity; rather, it targets areas of the Chinese economy that have been neglected by the market. A Chinese Green JG program thus enables China's Supply-Side Structural Reform by stabilizing employment and enriches it by increasing needed capacity of the Chinese economy.

Second, my proposed JG program supports the Chinese economy's structural transition from export-led to domestic consumption-led. As Trump's trade war against China in the context of global populism, nationalism, isolationism, and protectionism signals a "new normal," the Chinese economy must develop its resilience against external demand shocks by promoting its domestic demand (China State Council 2018). A JG program can facilitate this process through increasing the purchasing power of the previously unemployed Chinese workers (who have a greater marginal propensity to consume).⁷ As the JG program creates employment, it increases workers' disposable income, thereby increasing workers' consumption and stabilizing firms' profits and balance sheets. Hence, the JG program begins with creating public sector employment to achieve public purposes and ends by stimulating the market economy to promote economic growth.

Third, a JG program alleviates macroeconomic pressure arising from China's slowdown in population growth rate. The decline in China's population growth rate entails two macroeconomic issues. First, China's labor supply growth will decelerate, which implies that cheap labor cannot be a long-term strategy to secure international competitiveness for Chinese manufacturing. Second, China's domestic demand will be harder to manage since the unborn Chinese people would not buy goods and services. A JG program helps address both issues. By offering a job to any Chinese willing, able, and ready to work, a JG allows the Chinese economy to operate at full utilization of labor at a point in time. By guaranteeing employment, a JG program also brings economic security to Chinese households that should positively impact China's population growth rate, thereby increasing China's labor supply over time. In terms of its impact on domestic demand, a JG program stabilizes domestic consumption by paying wages to the previously unemployed workers. These new wages translate into consumption more effectively, since JG workers tend to exhibit much higher marginal propensity to consume than high-income earners.

Fourth, I mentioned before that the Chinese state's macroeconomic policy in the last few years had preferred tax cuts and monetary policies to direct government spending, which reduced the effectiveness of budget deficits. A JG program can be much more economically stimulative even with the same amount of impact on fiscal budget. For instance, a one million RMB personal income tax cut for Ma Yun⁸ produces limited macroeconomic stimulative effects since Ma Yun's

⁷ Keynes in *The General Theory* argues that lower-income workers spend a larger proportion of additional income on consumption and therefore have a greater marginal propensity of consumption.

⁸ Founder of Alibaba, the largest e-commerce company in China by revenue.

consumption habit will hardly be affected by the additional income. Similarly, a one million RMB corporate tax cut does little to stimulate the economy when the corporation uses the money not to invest but to buy back its stock in the financial market. However, a one million RMB wage in the hands of the Chinese JG workers will likely translate most (if not all) of that amount into consumption (and most likely consumption of domestically produced goods and services), thereby stimulating economic growth via the multiplier effect. Both tax cuts and JG spending in my example have the same impact on fiscal budget. Yet, they produce drastically different stimulative and distributional effects.

It is also important to note that the JG program does not compete with the private sector in the end market since they produce different goods and services. The JG program does, however, compete with the private sector in the input market for workers. This allows the JG to ensure the basic benefits of workers – since a worker can always earn a living wage in the JG program if being mistreated by the private employer. The JG wage thus effectively becomes the minimum wage. However, the JG wage needs to be appropriate – high enough to be a living wage and low enough to not cause wage-led inflation or impair private employers’ ability to hire. If the JG wage rate is set too high, exporting industries could see their international competitiveness undermined due to increased labor costs. Considering the Chinese state’s vision to maintain China’s industrial dominance, I use 3700 RMB⁹ as an average JG worker’s monthly income to estimate the cost of a Chinese Green JG in section IV. I also compute the total financing cost of a Chinese Green JG if an average JG worker were paid 5700 RMB a month which, while probably being too high, demonstrates the financial viability of a Chinese JG.

Another reason that China would especially benefit from a Green JG results from the strategic role of the Chinese SOEs in the Chinese economy. A JG program should be considered a more desirable solution to address unemployment and economic deceleration than having the State-Owned-Enterprises (SOEs) to expand hiring and investments when there are no market demands.¹⁰ A Chinese JG program thus allows the Chinese SOEs to focus on their industrial strategies, improve operational efficiency, and thereby expand international competitiveness. This, of course, does not mean that a JG program will or should take away the many other important responsibilities shouldered by the SOEs, such as investments in R&D.

Nevertheless, above I have shown that a well-designed Chinese JG program can effectively address China’s economic growth and employment concerns while complementing the Chinese state’s goals in implementing the SSSR, countering trade wars and international protectionism, coping with the slowdown in population growth, transitioning to a domestic consumption-led economy, and increasing the effectiveness of fiscal deficits. A JG program thus especially benefits China in terms of balancing China’s economic growth, employment, and structural adjustments –

⁹ 3700 RMB per month is selected because it is the average wage for Chinese peasant-workers in 2018. The 2019 figure is not yet available.

¹⁰ Such as during the 2008 Global Financial Crisis, many Chinese SOEs were directed to scale up production despite making a loss at the time in order to stabilize employment.

three macroeconomic goals elaborated by Premier Li Keqiang (Li 2019). Since a JG program can be designed to fulfill environmental goals, I propose a Chinese Green JG as a synthesized economic-environmental policy to help China coordinate economic growth, employment, structural adjustments, and environmental sustainability.

III. Why China's Time to Implement a Green JG is Ripe

I have demonstrated in the previous section that China would especially benefit from a Green JG program. Whether it is to counteract the unemployment pressure from structural adjustments, to cope with the U.S.-China trade war in an increasingly conflictual international political climate, to better transition the Chinese economy from export-led to domestic consumption-led in the context of declining population growth, or to promote economic growth without sacrificing the environment, a Green JG program is an effective policy tool. These are the *demand-side* reasons for why China's time to implement a Green JG is ripe. In this section, I explain the *supply-side* reasons – why China is ready and capable to implement a Green JG.

First, from the political economy perspective, a Green JG can be an important component of the “Chinese Characteristics” of China's socialist market economy. As I concluded in my essay, *Transformation, not Transition: A Critical Survey of China's Political Economy*, in order to understand the future of the Chinese economy, the question to ask is not whether China should have the market or not, or whether the Chinese state is interfering too much, but rather what kind of a market economy best fulfills the developmental vision set by the Chinese state. Following Deng Xiaoping's “black cat, white cat” principle, a market economy is simply a tool, not an end for the Chinese state. Hence, compared with capitalist market economies, China faces no significant political and ideological barriers to adopt a socialist labor policy.¹¹

By definition, a Job Guarantee program creates employment opportunities for those who are left behind by the market economy. Hence, it complements the market economy as opposed to replacing it. This is consistent with the Chinese state's two primary visions for its economy that I elaborated in my first essay: a continuous determination to the market economy and a continuous search for and expansion of the Chinese characteristics of that market economy. A full-employment market economy is therefore a concrete reflection of China's socialist market economy. As it becomes increasingly clear that China's political economy ushers a different yet viable political and economic order that challenges the Western liberal democracy and free market ideals, China is in a stronger political and institutional position to implement the Green JG.

Furthermore, while President Xi's “confidence doctrine”¹² enables the implementation of a socialist labor market policy like a Green JG, the “confidence doctrine” itself can be strengthened

¹¹ Bernie Sanders included a new “New Deal” as his core economic policy when he ran for the U.S. presidency in 2016. Many criticized this policy for being too socialist.

¹² The four confidences include: confidence in path, confidence in system, confidence in theories, and confidence in culture.

and enriched by the Green JG. This reason is simple: if the Chinese state successfully implements a Green JG to eliminate unemployment (which, as Keynes argues, is a persistent structural problem of the market economy), it would truly be enriching the meaning of China's "socialist market economy with Chinese characteristics." A full employment socialist market economy has every reason to be confident in its "path, theory, system, and culture" (Xi 2017).

Second, China's time to implement a *Green JG* is ripe because, as I elaborated in my essay, *China's Ecological Civilization: From Contradiction to Synthesis*, China's environmental policy climate today seeks synthesized environmental-economic policies to address the contradiction between economic growth and environmental sustainability. Like implementing synthesized environmental-industrial policies and laws to improve energy efficiency and conservation, the Chinese state since 2005 has also positioned the renewable energy sector at the core of its national industrial planning to ensure energy security for the future. Though it is not always possible to align monetary efficiency and environmental efficiency, there exists substantial synthesis between economic growth and environmental sustainability. For example, as Chen estimates, "spending within three segments of the renewable energy sectors – solar, wind and bioenergy will produce in combination about twice as many jobs per dollar of expenditure than an equal amount of spending on fossil fuels [in China]" (Chen 2018).

Considering this positive development in China's environmental policy climate in recent years, the time for China to implement a *Green JG* is ripe. This is because a Green JG can contribute to environmental sustainability in two primary ways. As Forstater, Kaboub, and Kelsay state:

There are two main ways in which the JG program can promote ecological sustainability. First, JG workers can be directly employed in activities that enhance the environment. Examples include recycling, clean up, community gardens, and so on. Second, even if JG workers are not directly engaged in activities related to the environment, an economy brought to full employment through the JG will be more sustainable than one in which the job creation comes through stimulating private sector growth. JG activities need not use scarce natural resources or methods of production that pollute. There is a whole spectrum of near pure services that use virtually no natural resources at all (2015)

Third, China's time to implement a Green JG is ripe because empirical lessons are abundant from a variety of foreign, domestic, formal, and informal adoptions of JG programs. Internationally, from WWII to the 1970s, a variety of Western countries adopted informal JG. For example, the American New Deal included job creation programs such as the Civilian Conservation Corp (CCC) and the Works Progress Administration (WPA) that were responsible for building much of the U.S. infrastructure that Americans still use today. Sweden developed broad based employment programs that substantially increased the availability of public goods and virtually guaranteed employment to anyone willing, able, and ready to work. A number of countries including Australia maintained "a close approximation of full employment through a combination of high aggregate

demand plus loosely coordinated direct job creation. Often there would be an informal ‘employer of last resort,’ such as the national railroads, that would hire just about anyone” (Wray 2012). After its 2001 economic crisis that saw the collapse of its currency sovereignty, Argentina created a formal employment Plan *Jefes y Jefas* that guaranteed a job for poor heads of households (Kostzer 2008; Tcherneva 2012). The program “created 2 million new jobs that not only provided employment and income for poor families, but also provided needed services and free goods to poor neighborhoods” (Wray 2012). Another example of a formal but partial JG is India’s 2005 National Rural Employment Guarantee Act.

Domestically, China has also adopted informal and partial JG programs. For example, China’s traditional infrastructure stimulus programs are in effect partial experiments of the JG program. The difference is that infrastructure investments stimulus stabilizes employment temporarily while the JG program permanently eliminates unemployment. Moreover, infrastructure investments stimulus only targets China’s infrastructure while the JG program aims to address deficiencies in the Chinese economy, including but not limited to infrastructure needs. As another example, China has also experimented partial JG programs in conjunction with its ecological immigration. In her essay, *Ningxia’s Ecological Immigration Program: An Embryonic Employer of Last Resort Program*, Li found that, “NEIP [Ningxia Ecological Immigration Program] bears some embryonic characteristics of JG green jobs programs” and concluded that:

It is likely that the personnel responsible for NEIP were never directly exposed to the JG literature. However, through their own trial and error from real-world experimentation of NEIP over 30 years, the local government in Ningxia has figured out a unique program that has made quite some achievements and possesses a few features of the JG program (Li 2013)

Finally, the Chinese state is capable of implementing a Green JG because the Chinese central government as the monopoly issuer of RMB possesses the monetary sovereignty necessary to sustainably finance a Chinese Green JG, which I discuss further in section V.

In this section, I have explained why China’s time to implement a Green JG is ripe. While the *demand-side* reasons concern with why China needs a Green JG, the *supply-side* reasons concern with why China is ready to implement a Green JG. My conclusions are as follows. First, the Green JG’s ability to address the structural defect of a market economy – persistent and structural unemployment – qualifies it to contribute to and to benefit from China’s pursuit of a socialist market economy with Chinese characteristics. The Green JG does not replace the market economy but instead makes it better. Hence, China faces no significant political or ideological obstacles to implement a socialist policy like the Green JG. Second, China’s environmental policy climate since 2005 has sought synthesized environmental-economic policies to address the contradiction between economic growth and environmental sustainability. The Green JG qualifies as such a policy to promote both full employment *and* environmental sustainability. Third, there have been abundant empirical lessons from a variety of foreign, domestic, formal, and informal adoptions of

JG programs. China can learn from these experiences when crafting and implementing its Green JG. Finally, China possesses monetary sovereignty, which is a key economic precondition for pursuing a JG program.

IV. The Economic Benefits and Costs of a Chinese Green JG

In this section, I calculate the true cost of implementing a full-fledged Chinese Green JG program by computing the economic benefit of JG and the economic cost of financing it. Since JG eliminates unemployment, the economic benefit of JG lies in eliminating the output loss arising from unemployment. Therefore, to calculate the economic benefits of JG, I use two methods to estimate China's lost output arising from its unemployment – the “average product” method (which estimates the lost output by multiplying the average GDP per Chinese worker/peasant¹³ by the number of Chinese unemployed workers) and the “Okun's Law” method (which is a generally accepted empirical rule that describes a quantitative relationship between changes in unemployment and changes in GDP). The intuition here is that as China achieves full employment, its GDP growth will expand. My work here is simply to estimate the size of that GDP expansion due to the elimination of unemployment.

I first use the “average product” method, which requires the knowing of the number of unemployed workers in China and the average GDP per worker in China. According to the National Bureau of Statistics of China, as of December 2019 China had an urban labor-force-survey unemployment rate of 5.2% and a total urban employment of 442.47 million (NBSC 2020). This means that in 2019, China had a total urban labor force of 466.74 million. Combined with the 5.2% urban unemployment rate, China had 24.27 million unemployed workers in 2019. Note that this figure assumes that the rural Chinese who worked as peasants in 2019 had no intention to migrate to cities to become peasant-workers¹⁴. Hence, the 24.27 million urban unemployment is a conservative estimate of China's overall unemployment. Considering that Chinese peasants are guaranteed access to at least some land in rural China, this is probably a reasonable assumption as well.

In 2019, China's GDP reached 99.0865 trillion RMB by employing a total of 774.71 million workers that included 442.47 million urban employment and 332.24 million rural employment (NBSC 2020). This means that the average GDP per Chinese worker/peasant is 127,901 RMB in 2019. Multiplying China's 24.27 million urban unemployment by the average GDP per Chinese worker/peasant (127,901 RMB) yields a lost output arising from China's unemployment in 2019 of 3.104 trillion RMB, which was 3.13% of China's 2019 GDP. In other words, the “average

¹³ China's Household Registration System specifies a Chinese citizen's origin as either rural or urban. “Peasant” is the official term in China to describe a Chinese citizen with a rural origin that lives and works in rural China.

¹⁴ “Peasant-worker(s)” is the official term used in China to describe a peasant (with a specified “rural” status in the Household Registration Book) who works and lives in urban China, often in precarious conditions.

product” method shows that the 24.27 million urban people unemployed cost the Chinese economy approximately 3.13% of GDP in 2019.

Note that the “average product” method assumes that the unemployed Chinese workers are, on average, contributing the same amount of value-added to China’s GDP as an average employed worker/peasant in China. It is possible that the average unemployed urban Chinese worker, once employed, contributes less value-added to GDP than the average currently employed urban Chinese worker. However, an argument can also be made that the average unemployed urban Chinese worker is more productive, in terms of their total value-added contribution to GDP, than the average currently employed rural peasant (which account for 43% of China’s total labor force in 2019) (NBSC 2020). Hence, by accounting for both urban and rural labor’s value-added contribution to GDP, the average GDP per worker/peasant figure that I used in my calculation should serve as a reasonable measurement for estimating the potential value-added contribution of GDP from an average urban unemployed worker in China.

To ensure that my assumption above was reasonable and even conservative, I use the “Okun’s Law” method to cross-examine China’s lost GDP arising from unemployment. As mentioned before, Okun’s Law is a generally accepted and tested empirical rule that describes a quantitative correlation between changes in unemployment and changes in GDP. Okun, in his 1962 paper, *Potential GDP: Its Measurement and Significance*, found that 1% reduction in the unemployment rate corresponded with a 3% increase in real GDP, which implied an “Okun coefficient” of 3. Since Okun, there have been some revisions to Okun’s method and extensions to other time periods and other countries (Altig, Fitzgerald, and Rupert 1977, Lee 2000, Dritsaki, Chaido and Nikolaos Dritsakis, 2009). Consequently, the empirically tested Okun coefficients have varied by time and by country and have mostly fallen between 1.5 and 3. In order to be conservative in estimating the benefits of JG, I use an Okun coefficient of 1.5 to estimate China’s lost GDP arising from unemployment.

A conservative Okun coefficient of 1.5, combined with China’s 5.2% urban labor-force-survey unemployment rate in 2019, suggests that China’s lost GDP amounts to 7.8% in 2019. This means that a fully-fledged JG program would have contributed an additional 7.8% to China’s existing 6.1% GDP growth rate in 2019, reaching a whopping 13.9% GDP growth rate. However, this calculation exaggerates the economic benefit of JG because it would be a mistake to use the 5.2% urban labor-force-survey unemployment rate as a measurement for China’s overall unemployment rate (NBSC 2020). This is because the unemployment rate for the rural Chinese is supposedly zero as Chinese peasants are guaranteed access to at least some land in rural China. It is for this reason that the National Bureau of Statistics of China only reports urban unemployment rate. Therefore, I compute China’s overall unemployment rate by dividing China’s total number of urban unemployed workers by its total labor force that includes both urban and rural labor forces.

My calculation before already showed that China’s total urban unemployment in 2019 was 24.27 million. In 2019, China’s total labor force equals to the sum of total rural labor force (332.24

million) and total urban labor force (466.74 million), which is 798.98 million. The 24.27 million urban unemployment, combined with China's total labor force of 798.98 million in 2019, suggests that China's overall unemployment rate in 2019 should be 3.03% (NBSC 2020). Then, using an Okun coefficient of 1.5, I determine that China's lost output arising from unemployment in 2019 amounted to approximately 4.55% of 2019 GDP.

Recall that the "average product" method suggests that China's lost output arising from unemployment in 2019 equals to 3.13% of GDP. The "Okun's Law" method computes a greater output loss even with my conservative choice of the Okun coefficient. This discrepancy, however, is expected. This is because the "average product" method assumes the number of unemployed workers to be fixed while the "Okun's Law" method considers actual historical patterns that each additional percentage point reduction in unemployment rate requires even more jobs to be created, as Forstater, Kaboub, and Kelsay explained:

Okun's coefficients take into account actual historical patterns. One of the theorized reasons why the coefficients are consistently above 1 is that as more jobs become available, more people will enter the labor force to look for jobs. Thus, an economy will actually have to be employing a higher number of people in order for the unemployment rate to fall each additional percentage point (2015)

Above I have estimated the GDP cost of unemployment in China using the "average product" method and the "Okun's Law" method. The conclusion is that urban unemployment in China costs between 3.13% to 4.55% of GDP per year. Note that in both methods, I used the more conservative estimates whenever possible to calculate the GDP cost of unemployment. Since my proposed Green JG eliminates unemployment by offering a publicly funded job to anyone willing, able, and ready to work, the economic benefit of JG is precisely in eliminating the lost GDP arising from Chinese unemployment. This means that a full employment Chinese economy would have grown an additional 3.13% to 4.55% of GDP in 2019, reaching a total GDP growth rate in the 9.23% to 10.65% range.

To complete the cost-benefit analysis of a Chinese JG, I now calculate the cost of financing it. For consistency, I continue to use 24.27 million as the total number of unemployed workers in China. I assume the JG wage to be 3700 RMB per month¹⁵. On top of that, I assume an additional 35% of the total wage bill to cover the "Five Insurances"¹⁶ benefit costs and another 10% of the total wage bill to pay for all the logistical and material costs associated with executing the JG program. The financial costs of implementing a JG in China are as follows:

¹⁵ 3,700 RMB per month was the average monthly income for peasant workers in China in 2018. I used this figure in my calculation due to the unavailability of the 2019 data.

¹⁶ "Five Insurances" are considered a generous benefits package for Chinese employees. Together, they account for about 35% of an employee's wage bill.

Table 1: Job Guarantee Cost Estimates

Average JG Wage (RMB)	Number of JG Workers Employed	Total Wage Bill (RMB)	Total Annual Benefits (RMB)	Logistical and Material Costs (RMB)	Total Financing Cost of JG (RMB)	Cost of JG as Percentage of 2019 GDP
3,700	24.27 million	1.077588 trillion	0.3771558 trillion	0.1077588 trillion	1.5625026 trillion	1.58%

Source: Author’s calculations.

Hence, from a strictly economic point of view, the economic benefit of having a JG program is between 3.13% and 4.55% of China’s 2019 GDP. The cost of having a JG program is 1.58%. The net economic benefit for a Chinese JG program is therefore overwhelmingly positive. In other words, increasing China’s fiscal deficit by 1.58% of 2019 GDP would be enough to finance a complete Chinese Green JG to eliminate China’s 24.27 million urban unemployment and elevate China’s GDP growth rate from 6.1% to the 9.23% and 10.65% range in 2019.

It is important to note that, in my analysis, I have purposefully underestimated the benefits of JG and overestimated the costs of implementing it in order to make a more compelling case. I underestimated the benefits of JG because I only conservatively quantified the economic growth benefit as a result of full employment. Other benefits of a Green JG, such as social stability, environmental sustainability, and economic security for the Chinese people, are arguably more valuable despite not being assigned a monetary value. On the other hand, I purposefully overestimated the cost of implementing it. For instance, a full employment Chinese economy will spend less on unemployment insurance and crime prevention. Spending by JG workers will also contribute to tax revenue. Hence, financing the JG program reduces government spending in other areas and increases tax revenue through the macroeconomic simulative effects from increased consumption from JG workers. The true cost of implementing a Chinese JG should thus be much less than the projected 1.58% of China’s 2019 GDP.

V. Sustainability and Functionality of China’s Deficit Spending

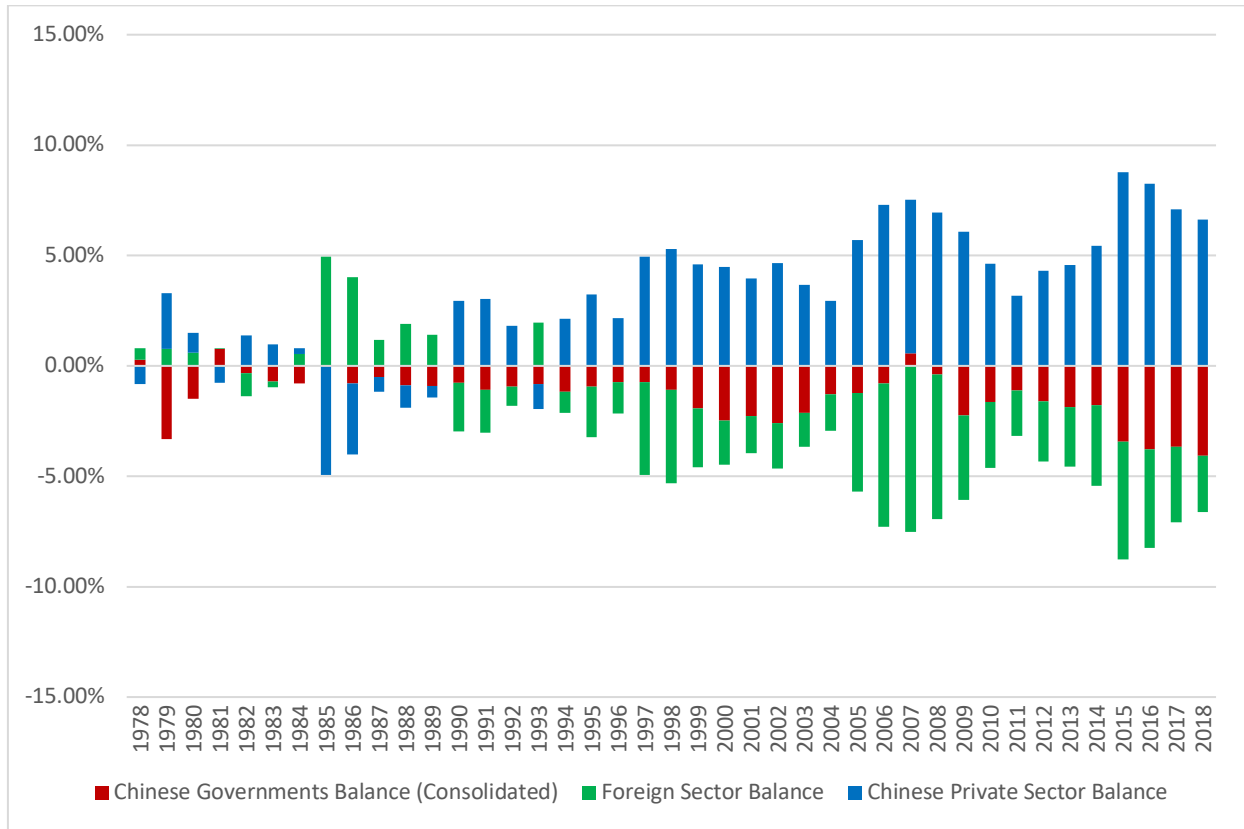
Even though a Chinese JG makes economic sense for the Chinese economy, some may be concerned about the sustainability of China’s deficit spending and national debt. Proponents of fiscal austerity or “sound finance” often cite Greece as an example to illustrate the disastrous outcome of irresponsible government deficits. In this section, I debunk the myth of sound finance by examining China’s, Greece’s, and the United States’ sector balances. My thinking has been inspired by the vast literature from functional finance, Modern Money Theory, credit theory of money, and state theory of money (Lerner 1943, Knapp 1973, Minsky 1993, Goodhart 1998, Wray 1998, and Bell 2000, Forstater 2000, etc.). My conclusions are as follows. First, for a monetarily

sovereign country like China or the U.S., government deficits are not only sustainable but also functional to stabilize private sector balance sheets. Second, Greece's Euro debt crisis in 2008 was not due to the irresponsible deficit spending by the Greek government. Greece's increased government deficits post-2008 were the *results* of the crisis, not the causes of it. Greece's Euro debt crisis was inevitable when Greece relinquished its monetary sovereignty (Greek Drachma) to adopt the Euro in 2001 during which Greece's trade deficits were quickly expanding.

Before presenting the results of China's, the U.S.'s, and Greece's sector balances, it is necessary to explain what a sector balance is. At the level of a country's macroeconomy, aggregate spending is, by accounting identity, equal to aggregate income (i.e. every RMB spent is received as income). Wynne Godley in 1996 suggested that it would be useful to divide a country's macroeconomy into three sectors – domestic government (central and local), domestic private (firms and households), and foreign sector (the rest of the world). This means that “If one sector spends more than its income (deficit), at least one other must spend less than its income (surplus) to maintain the aggregate identity that total spending equals total income. The balances (income minus expenditure) of the three sectors have to add up to zero since we are adding up all the income in the economy and subtracting all the spending, which are equal by identity” (Wray 2019).

Hence, as a macroeconomic accounting identity, “Domestic Private Sector Balance + Domestic Government Sector Balance + Foreign Sector Balance = 0” holds true for any country. Based on this accounting identity, I produced China's 3-Sector Balances as a percentage of GDP from 1978 to 2018. The result is as follows:

Figure 2: China's Sectoral Balances as % of GDP (1978-2018)



Source: National Bureau of Statistics of China

Important insights can be gathered by examining China's 3-sector balances as a percentage of GDP from 1978 to 2018. First, the Chinese private sector balances (blue bars) have mostly been in the surplus territory, which were made possible by the Foreign Sector deficits (green bars) and the Chinese government sector deficits (red bars). Note that the Foreign Sector deficits are, by definition, China's foreign trade surpluses. In other words, the Chinese private sector surpluses were made possible by China's foreign trade surpluses and the Chinese government deficits. Indeed, it is healthy that the Chinese private sector (firms and households) has been net accumulating financial wealth at around 5% of GDP per year since 1997. In 2015, the Chinese private sector achieved its highest surplus as a percentage of GDP at around 8%. Since 2015, however, the Chinese private sector surplus as a percentage of GDP has declined noticeably, mostly due to the decline of Foreign Sector deficits (green bars), which meant that China's trade surpluses as a percentage of GDP had declined.

Second, the Chinese governments balance, which includes central and local governments balances, has consistently been in the negative territory (represented by the red bars). This is desirable since Chinese government deficits, together with China's foreign trade surpluses, have been necessary to enable the Chinese private sector to run surpluses historically. Moreover, the consolidated

Chinese government deficits from 2015 to 2018 had expanded as a percentage of GDP, which offset some of the pressure arising from China's reduced foreign trade surpluses as a percentage of GDP during the same period. However, since 2015, the increases in China's government deficit as a percentage of GDP have not been large enough to offset the decreases in China's trade surplus as a percentage of GDP. As a result, China's private sector surplus as a percentage of GDP has declined from around 8% in 2015 to 6% of GDP in 2018.

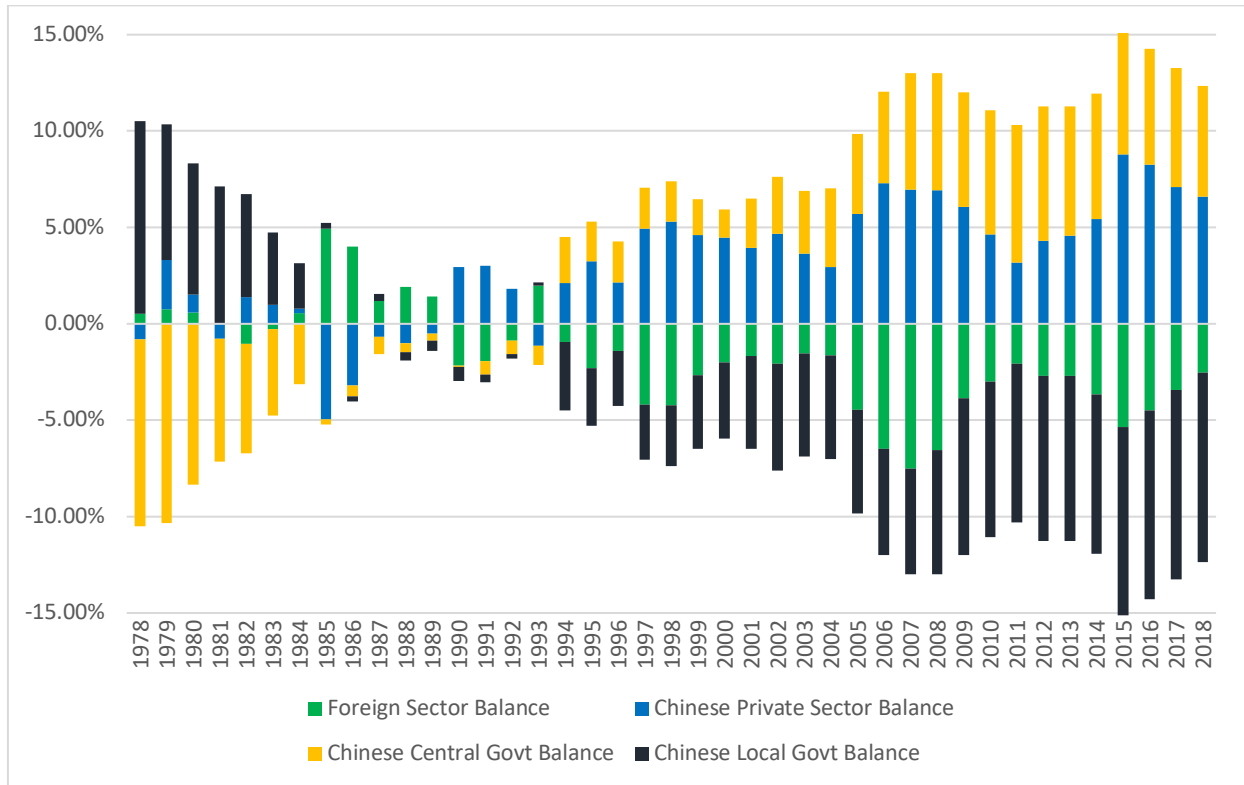
Third, China's 3-sector balances suggest that China's financial system has been in a sound position for most of the years since 1978. This is because China's three sectors have been in their sustainable territories most of the time. First, it is sustainable for the Foreign Sector (green bars) to remain in the deficit territory since that simply means that China runs an international trade surplus against the rest of the world.¹⁷ Second, it is sustainable for the Chinese government sector (red bars) to remain in the deficit territory since the Chinese government (the Chinese central government, to be precise), as the sole issuer of RMB, faces no default risk on RMB-denominated debt. The default risk for the Chinese central government bonds is zero not because the international credit market deems RMB bonds trustworthy but because the Chinese central government pays interests of its bonds (which are denominated in RMB) by crediting RMB into existence.¹⁸ Third, it is sustainable and even necessary for the Chinese private sector to remain in the surplus territory. This is because private sector surpluses represent accumulation of private savings that strengthen the financial positions of firms and households who, as currency users of RMB, face real default risk. An implication is that if China's foreign trade surpluses as a percentage of GDP decline, the Chinese government deficits must expand to facilitate surpluses for the Chinese private sector.

However, China's 3-sector balance does not tell the complete story. Using government finances data on the National Bureau of Statistics of China, I have disaggregated China's government balance into the Chinese central government balance and the Chinese local governments balance. The result is a 4-sector balance for the Chinese economy shown as below. Note that the 4-sector balance is, in principle, the same as the 3-sector balance, since they are based on the same accounting identity that aggregate spending equals to aggregate income for any given country's macroeconomy.

¹⁷ However, the size of the green bars (i.e. China's trade surplus as a percentage of GDP) may decrease as China transitions to a consumption-led economy. Also, it is not sustainable for every country to accumulate trade surpluses – for there to be a trade surplus, there must generate a trade deficit.

¹⁸ This is the same reason why the United States Federal Government can never be forced to default on USD-denominated liabilities.

Figure 3: China's Sectoral Balances as % of GDP (1978-2018)



Source: National Bureau of Statistics of China

As expected, China's 4-sector balance shares some common information with its 3-sector counterpart. For example, it still shows that China's private sector surplus (blue bars) has been around 5% of GDP since 1997. It also shows foreign sector running deficits (green bars) against China since 1994, which is identically equivalent to China's running foreign trade surpluses since 1994. However, China's 4-sector balance reflects a critical concern within the Chinese economy.

Most notably, we can see that the Chinese central government (represented by the yellow bars), as the sole issuer of RMB, has run consistent surpluses since 1994. The contribution from foreign sector deficits (i.e. China's trade surpluses) to China's private sector surpluses were almost entirely offset by the Chinese central government surpluses (i.e. the yellow bars and the green bars approximately offset each other). On the other hand, China's local governments (represented by the black bars), as RMB users, have run consistent budget deficits to enable the Chinese private sector surpluses. This means that without the large deficit spending by the Chinese local governments, China's private sector would not have been in surplus position in the last two decades.

China's case indeed reflects China's particularity. The United States and other monetarily sovereign countries normally run federal government deficits and balanced local government

budgets. This is because a central/federal government with monetary sovereignty is not revenue constrained whereas local governments are. When the Chinese treasury spends, it creates RMB into existence. This represents an injection of income into the private sector, which becomes private savings. When the Chinese central government taxes, it destroys RMB, which represents a leakage of income out of the Chinese private sector. Chinese local governments, however, are revenue constrained since they cannot spend RMB into existence. They must spend by raising enough revenue through local tax collection, land sales, bank loans, and/or issuance of local government bonds, etc.

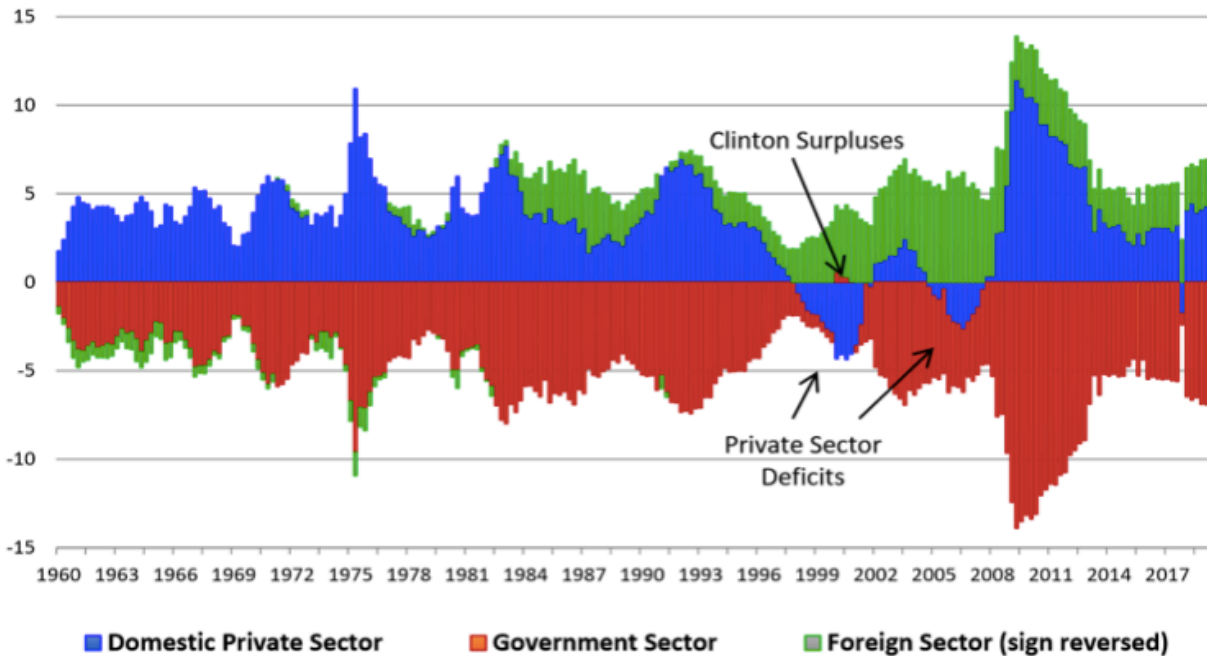
Therefore, it makes little sense for the Chinese central government, as the sole issuer of RMB, to run surpluses that are denominated in RMB. It is irrational because the Chinese central government cannot default on RMB-denominated liabilities, and hence an RMB surplus for the Chinese central government is meaningless if the concern is for the Chinese central government to remain solvent and operational. This particularity reflects an anachronistic thinking dating back to the pre-1971 Gold Standard era during which all countries were effectively currency users by pegging their currencies to gold and silver. The Chinese central government, with monetary sovereignty, can and should practice “functional finance” (Lerner 1943). This means that the Chinese central government should conduct fiscal and monetary policies according to the desirable *effects* of these policies, not according to some pre-established doctrine about what is sound or unsound (such as the so-called 3% deficit to GDP rule in the Maastricht Treaty adopted by the EU).

It is important to note that functional finance by no means suggests unlimited government spending, nor does it ignore the fact that government deficits may create inflationary pressures. Indeed, if the economy is already at full employment, any additional deficit spending will be purely inflationary without creating jobs or increasing economic growth. If the economy is below full employment, however, deficit spending increases aggregate demand and aggregate supply at the same time, which may or may not cause substantial inflation. The other issue is that due to automation, conventional government deficit spending may promote economic growth but not job growth. It is therefore desirable that deficits be used to finance a Chinese Green JG since such a program would directly create jobs and consequently promote economic growth.

In theory, it is not sustainable for the Chinese local governments to remain in the deficit position, let alone run a deficit close to 10% of GDP per year. The Chinese local governments, just like private firms and households, face real default risk. In practice, however, this has not been an issue since Chinese local governments have been guaranteed financing by the Chinese state-owned banks. Therefore, if the Chinese local governments continue to obtain financing from banks or find buyers of its local government bonds, this should not develop into a systemic financial issue for the Chinese economy. An important implication, however, is that the Chinese state must not adopt a fiscal austerity reform on the Chinese local governments until the Chinese central government starts running sizable deficits itself.

I am also including the 3-sector balance for the United States from 1960 to 2019 here to emphasize the sustainability and functionality of government deficits for a monetary sovereign country. The graph below is taken from Randall Wray’s congressional testimony for the United States House Budget Committee on November 20, 2019.

Figure 4: US Sectoral Balances 1960-2019Q2



Source: BEA. Note: The government balance in the fourth quarter of 2017 reflects a one-time deemed repatriation tax on foreign earnings accumulated after 1986.

As we can see, the United States private sector (blue bars) has been in the surplus territory most of the time, which is what should happen in a healthy economy. The difference as compared to China is that the United States runs a foreign trade deficit, which means that the rest of the world runs a surplus against it (green bars). This means that in order for the U.S. private sector to run a surplus, the U.S. domestic government must not only run a deficit but also run one that is larger than the size of its trade deficit. Hence, it is not surprising that the U.S. government has historically ran a deficit-to-GDP ratio exceeding 5% and even as high as 13% during the 2008 financial crisis. Note that these deficits never entailed actual bankruptcy risks for the U.S. federal government after 1971 when the U.S. ceased with the gold standard. Indeed, some U.S. policymakers, including Ben

Bernanke¹⁹ and Alan Greenspan,²⁰ have made it explicit that the U.S. federal deficits and national debts are sustainable due to the U.S. federal government's monetary sovereignty with the U.S. dollars. An article by the U.S. Federal Reserve Bank of St. Louis states it plainly:

As the sole manufacturer of dollars, whose debt is denominated in dollars, the U.S. [federal] government can never become insolvent, i.e., unable to pay its bills. In this sense, the government is not dependent on credit markets to remain operational (Federal Reserve Bank of St. Louis, 2011)

By running massive government deficits after 2008, the U.S. stabilized the balance sheets of private firms and households (shown as the long blue bars after 2008). Part of the deficits were the fiscal spending stimulus program carried out by the Obama administration, and part of the deficits were simply automatically generated – when unemployment rises, tax revenue goes down and government spending on unemployment insurance goes up, which together increases government deficit. It is also important to note that the U.S. economy and employment have remained strong in recent years despite an ongoing trade war with China largely due to the enlarging government deficits under the Trump administration that stabilized the U.S. private sector surpluses and hence the U.S. domestic consumption.

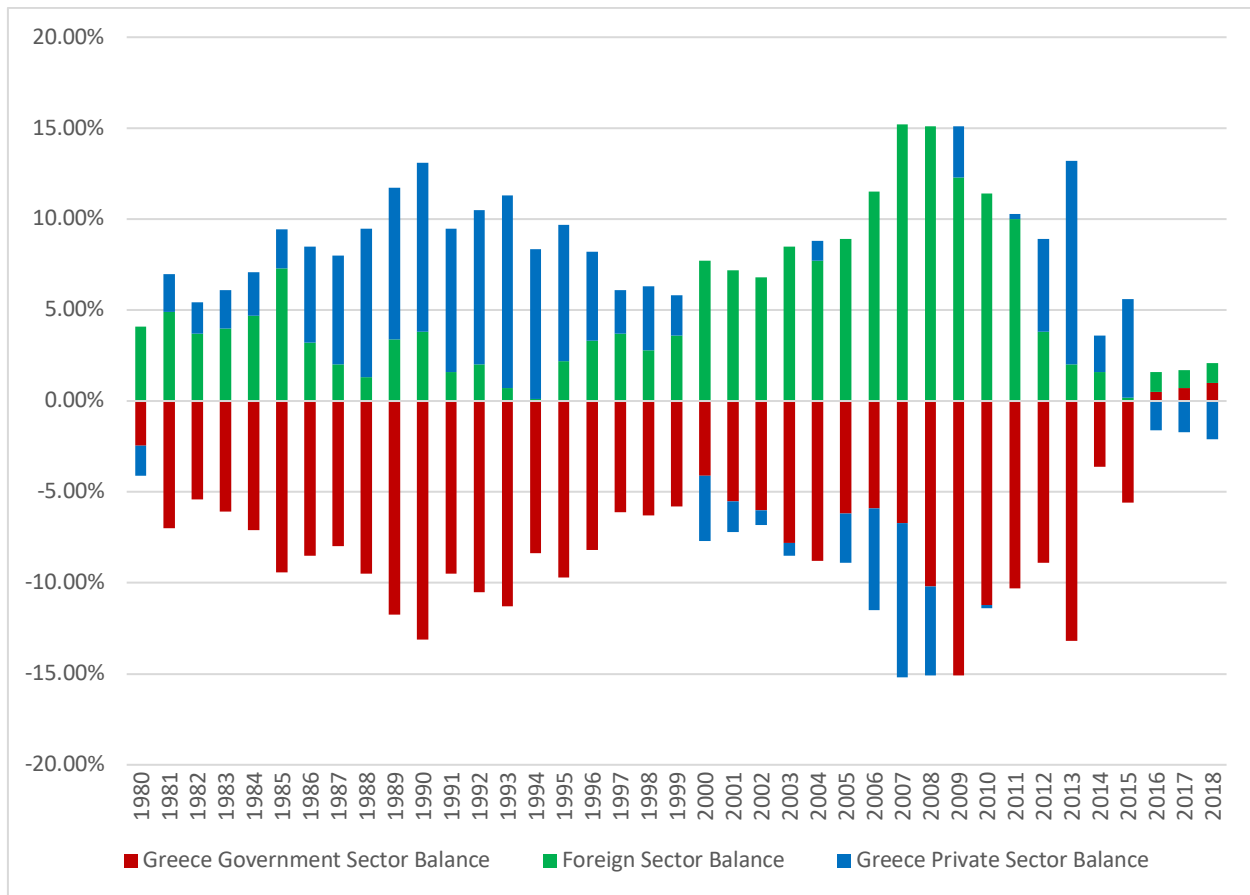
In short, government deficits are necessary to stabilize private sector surpluses, especially for countries that run trade deficits. Theoretically, with its foreign trade surpluses, the Chinese government can run surpluses (so long as the size of fiscal surplus is smaller than the size of China's trade surplus) together with the Chinese private sector. However, it simply makes no sense for the Chinese government (especially the Chinese central government), as the monopoly issuer of RMB, to accumulate budget surpluses denominated in RMB. If the Chinese central government decides to run surpluses, it should be for reasons other than an anachronistic sense of fiscal responsibility. Otherwise, its budget surpluses only decrease Chinese private sector surpluses.

To complete my analysis on the sustainability and functionality of government deficits, I now examine Greece's sector balances. Greece is an interesting case because proponents of fiscal austerity have blamed Greece's Euro debt crisis to irresponsible government deficits. Greece was once a monetary sovereign country that voluntarily gave up its monetary sovereignty in 2001 when it abolished Greek Drachma and adopted Euro. Its 3-sector balances from 1980 to 2018 are as follows:

Figure 5: Greece Sectoral Balances (1980-2018)

¹⁹ Ben Bernanke was the U.S. Federal Reserve Chairman from 2006 to 2014. In an interview with Scott Pelley in 2009, Bernanke was asked by Pelley, "Is that tax money that the Fed is spending?" Bernanke answered, "It's not tax money. We simply use the computer to mark up the size of the account."

²⁰ Alan Greenspan was the U.S. Federal Reserve Chairman from 1987 to 2006. His statement in 2011 caused quite a stir when he said, "The United States can pay any debt it has because we can always print money to do that. So there is zero probability of default."



Source: OECD data

Important insights can be gathered by analyzing Greece’s 3-sector balances from 1980 to 2018. First, it was clear that the Greek government was actively reducing its deficit-to-GDP ratio from 1995 to 2000 in order to satisfy EU’s fiscal austerity requirement to join the Eurozone. The Greek Government deficit (red bars) as a percentage of GDP reduced from 13% in 1990 to about 4.5% in 2000, the year prior to the Greece adopting the Euro. However, this supposed “fiscal responsibility” has also resulted in the Greece’s private sector surpluses as a percentage of GDP (blue bars) significantly reducing from a 9% surplus in 1990 to a 4% deficit in 2000.

Meanwhile, Greece’s foreign trade deficits (the reverse of the green bars) expanded significantly after adopting the Euro, as the Foreign Sector was net accumulating more surpluses (green bars) against the Greece economy from 4% of GDP in 1999 to a whopping 15% in 2008. These rapidly expanding Foreign Sector surpluses, combined with the Greek governments’ low deficit as a percentage of GDP, translated into nine consecutive years of deficits for the Greek domestic private sector (blue bars) from 2000 to 2008 (with the exception of a small private sector surplus in 2005 due to an increased government deficit that year). In 2007, the year prior to the 2008 Euro debt crisis, the Greek private sector reached a historic high deficit-to-GDP ratio of 7%.

It is unhealthy for the domestic private sector in any country to keep running deficits since private firms and households, as currency users, face real default risk if they could not obtain enough income denominated in the same currency to service debt commitments. In the case of Greece, those income and debt commitments were denominated in Euro, which could not be printed by the Greek private sector nor the Greek government (who had recently lost its monetary sovereignty in 2001). As the Greek private sector deficits accumulated, the default rate within the Greek economy increased substantially, and the unemployment rate rose. The Greek government thus saw its tax revenue decreasing while spending on social security increased after 2000, which automatically enlarged the Greek governments' deficits. But even then, to comply with EU's fiscal austerity, the Greek government deficit (red bars) increased only moderately from 2000 to 2007. The Greek government deficit reached around 7% of GDP in 2007 (right before the Euro debt crisis), which was still on the lower end of Greece's historical deficit-to-GDP ratios.

To finance its deficits, which are denominated in Euros, the Greece government had to issue Greek government bonds that were also denominated in Euros. The problem, however, is that this time the Greek government, as a currency user of Euros, could not simply print Euros into existence to service its Euro-denominated debt when it comes due. It was thus a matter of time before the market realized that the Greek bonds held a much higher default risk than German bonds since Germany could "afford" to run low budget deficits with strong foreign trade surpluses whereas the Greek government could actually default on Euro-denominated debt as it net-lost Euros every year due to trade deficits. As it became clear that the Greek government could not possibly pay its Euro-denominated debt, Greece pulled the political leverage by threatening to exit the Eurozone. Greece was then able to negotiate a deal with the EU and the European Central Bank (primarily Germany) to continue financing its government deficit spending and find ways to lower Greece's trade deficits. These efforts stabilized the Greek private sector. The Greek private sector (blue bars) has since run surpluses for most years after 2009. However, from 2016 to 2018, it has been operating in the negative territory, which is concerning. The difference is that this time the Greek private sector deficits are a relatively smaller percentage of GDP compared to when it first adopted the Euro in 2001. Hence, it may take longer for the Greece's second domestic financial crisis to materialize.

Nevertheless, the design of the Eurozone is problematic in its core. By adopting Euros, each Eurozone member country voluntarily gave up its monetary sovereignty and effectively became a local government as part of this "Eurozone Nation." As currency users of Euro, these Euro countries all have a default risk greater than zero, with some riskier than the others. The problem is that the Eurozone has a central bank (the EMU) to conduct monetary policy but not a central government that conducts redistribution fiscal policies. For example, there is a tremendous political obstacle in the way of "transferring" Germany's tax revenue to fund fiscal spending in the Greek economy. The Eurozone, as many have argued, was therefore designed to fail. Perhaps Germany benefited from the Eurozone by expanding its exporting advantages against other EU member countries. But it is especially difficult for the PIIGS countries (Portugal, Italy, Ireland,

Greece, and Spain) to operate as these countries' exporting industries were devastated by Germany's after adopting the Euro.

What is important to us is that Greece's increased government deficits were the *results* of the crisis, not the causes of it. Greece's Euro debt crisis in 2008 was not due to irresponsible deficit spending by the Greek government, since Greece's deficit-to-GDP ratios were on the lower end compared to Greece's historical records. Quite the opposite, it was the Greek government's inability to deficit spend due to its loss of monetary sovereignty, combined with Greece's deteriorating trade deficits, that resulted in the Greek private sector deficits for nine consecutive years, which ultimately collapsed the Greek economy. Hence, what Greece's Euro debt crisis demonstrates is the disastrous outcome that arises when a monetarily sovereign country gives up its monetary sovereignty, not the unsustainability of fiscal deficits. In fact, it is fiscally irresponsible for a government with monetary sovereignty to *not* run deficits since doing so reduces its domestic private sector surpluses.

In a nutshell, for a monetarily sovereign country like China or the U.S., government deficits and national debts denominated in its own sovereign currency are sustainable. The worst outcome of too much deficit spending is inflation, not default. The problems, however, are corporate, household, and local government deficits and debts. Continuous corporate, household, and local government deficits are not sustainable because firms, households, and local governments as currency users face real default risks. When a substantial number of firms, households, and local governments cannot receive enough income stream to validate their debt payments, a systematic meltdown of the financial system will likely occur because of interlocking balance sheets (Minsky 1986).

The main takeaways are as follows: when it comes to the sustainability and functionality of Chinese government deficits, my 3-sector Chinese sector balance shows that historically the Chinese private sector surpluses have been made possible with China's trade surpluses and the Chinese government's overall deficits (which are sustainable). My 4-sector balance approach, however, points out a critical concern regarding the composition of the Chinese government deficits. The Chinese central government has historically been running sizable surpluses that for the most part offset the contribution of China's foreign trade surpluses to China's private sector surpluses. Thus, the Chinese private sector surpluses have been made possible almost entirely by the large deficits of the Chinese local governments. I argue that it makes little sense for the Chinese central government as the issuer of RMB to run RMB surpluses and for the Chinese local governments as users of RMB to run continuous and large RMB deficits. My 4-sector Chinese sector balance also cautions that the Chinese state must not adopt a fiscal austerity reform on the Chinese local governments until the Chinese central government starts running sizable deficits itself. Otherwise, financial instability within the Chinese economy will likely occur. The Chinese central government ran a budget surplus equaling 5.7% of China's 2019 GDP. Reducing it to 4.12% would have been enough to finance a complete Chinese Green JG (which costs 1.58% of GDP as

estimated before) to employ China's 24 million urban unemployed and organically elevate China's 2019 GDP growth rate to the 9.23% and 10.65% range.

After addressing the sustainability and functionality of financing a Chinese Green JG with Chinese government deficits, I now turn to the design of a Chinese Green JG.

VI. Designing a Chinese Green JG

A Chinese JG program should be designed and implemented in a way that embraces China's particular needs and priority concerns. Therefore, in my previous analysis, in addition to introducing what a JG is, I have theorized why China would especially benefit from a Green JG, why China's time to implement a Green JG is ripe, how much a Chinese JG would contribute to China's GDP growth and cost China's fiscal budget, and why the financing cost of a JG is not only sustainable but also functional for China. I apply the same logic now to inquire how a Chinese Green JG should be administered, what types of jobs a Chinese Green JG should create, and why China's implementation of a Green JG should follow a gradualist approach.

a) Administration of a Chinese Green JG

Considering that the Chinese central government as an RMB issuer is not revenue-constrained and that the Chinese provincial and local governments as RMB users face real default risks, the Chinese central government should fund the bulk, if not all, of the JG program. Contributions from other entities, such as provincial and local governments and social philanthropists, are not necessary for financing purposes, but may still be encouraged to achieve other desirable outcomes. For example, requiring provincial and local governments to finance a part of the JG program might encourage more attentive implementation of JG at the provincial and local level. On the other hand, encouraging social philanthropists to contribute to the JG program could be worthwhile to create a public-private partnership platform for interested social philanthropists.

While the central government provides the financing, provincial and local governments should administer the JG. Specifically, provincial and local governments should identify local needs, submit corresponding JG proposals that would address these needs to the central government, administer the local JG programs by training and organizing the JG workers, and evaluate the program. Hence, once identifying an appropriate need, the JG administrator (provincial and local governments) should: 1) consult with experts to assess what specific works need to be done to address that need, and 2) propose the corresponding jobs to the central government for approval and funding. The central government should play the financier and the supervisory role by monitoring the performance of the JG program.

For example, jobs that enhance China's environmental service capabilities are important and urgent given the substantial costs of environmental pollution on public health. However, the private sector normally has little incentive to produce environmental service goods since it is not profitable. Green jobs that aim to enhance China's environmental service capabilities therefore

seem a natural candidate to be included in a JG for the environmentally degraded regions in China. So, administrators of the JG program in these regions should consult with environmental engineers to figure out what specific works need to be done and then propose to create the corresponding jobs. If the identified need is to tackle desertification and it has been determined that (re)forestation is an effective way to address desertification, then provincial and local governments should make a tree-planting JG proposal to the central government to be approved and funded.

Should the Chinese state adopt a gradualist approach to implement the Green JG (which I argue that it should), there is the added question about who the JG should prioritize in hiring at the beginning stage. Again, this should depend on China's particular needs and priority concerns. I suggest that military veterans be prioritized especially since a JG program can help them gain skills and work experience in the civilian economy and transition them to perhaps find employment in the market economy sector in the future.

b) Types of Jobs in a Chinese Green JG

After discussing the administration of the Green JG in China, I explore the types of jobs that could be created in a Chinese Green JG. In principle, the types of jobs created through a Chinese JG program are flexible through time because they should address the evolving deficiencies in the Chinese market economy. At any point in time, however, a JG program should create jobs in areas that are important and urgent but have been neglected by the market due to the lack of profit opportunities. My recommendation therefore reflects my understanding of the important areas that could be improved in the Chinese market economy as of 2020. For more fruitful identification of the deficiencies in the Chinese economy, local communities and governments of all levels could speak with more knowledge. Nevertheless, I am proposing the following three broad categories of JG jobs that I believe would be feasible and beneficial to the Chinese economy and society.

The first type, as I have repeatedly suggested in my essay, are the Green Jobs that aim to directly employ JG workers in activities that enhance the environment. The goal is to promote employment *and* environmental sustainability. As Forstater suggests, "it may be desirable to create an Environmental Service Corps, or Green Corps... [that] help society satisfy the biophysical conditions for a sustainable economy" (2003). I believe that the Chinese economy would especially benefit from establishing the Green Corps as a major component of its JG program to increase its environmental service capabilities and to better tackle its environmental issues. Examples of Green Corps jobs include reforestation, recycling, environmental cleanup, wildlife preservation, and community gardening, etc. Green Corps are suitable JG jobs also because much of these works are labor-intensive and require little training. As Forstater further explains, such a program has potential educational implications in addition to their direct environmental service efforts:

PSE [Public Service Employment] workers can visit classrooms and workplaces and do presentations. They can set up tables in the community to demonstrate the

effectiveness and simplicity of many sustainable practices... Doubtless there are many other areas where PSE workers can perform environmental services. The development of a Green Corps will provide a reservoir of labor that can contribute to sustainability in many ways... (Forstater 2003).

The second type are the cultural heritage preservation jobs that would be conducive to promoting confidence in Chinese path, system, theory, and culture. As globalization expands, cultures interchange. However, since modernization largely meant westernization for China in the past several decades, China has been a net culture importer, which entails both benefits and challenges. One notable challenge is that the imported U.S. and western values and cultures from Hollywood are often presented as timeless and superior to the Chinese and other eastern countries' traditional values. This has the potential to create a clash of civilization or an ideology war within China among different generations and social classes. Hence, as globalization continues to do its work, a cultural heritage preservation program provides important sources to Chinese citizens. Instead of picking a winner, the cultural heritage preservation program helps the Chinese society be more informed of traditional Chinese values and cultures and their contemporary relevancy. Many of the cultural heritage preservation jobs require specialized knowledge, which are perfect for the millions of Chinese university graduates majoring in humanities and arts that could not find suitable employments in the market economy.²¹ As Kaboub describes:

[cultural heritage preservation workers are] devoted to information dissipation, conservation of local/regional history, culture, and traditions. Such projects would involve higher education graduates with degrees/specializations in history, anthropology, sociology, computer science, geology, psychology, ethnography, social work, folklore studies, literature, religious studies, art, art history, photography, journalism, communications, statistics, music, dance, graphic design, and architecture... (Kaboub 2007)

Cultural heritage preservation in China is currently mostly done by the Chinese state. Instead of the government preaching traditional values to Chinese citizens, the JG workers (such as the university graduates majoring in Chinese literature, history, and arts, etc.) might do a more effective job communicating to the public, especially with the synergistic effects of social medias. For example, my mother initiated an early childhood philosophy education program that, in my view, presented the contemporary relevancy and charm of Chinese traditional values, such as the roles of altruism and collectivism in a modern competitive society. While she continues to make all educational materials (in the forms of cartoon videos and audio stories) free to the public, her program can certainly benefit from the help of cultural heritage preservation workers to create new content and reach a greater audience.

²¹ Doing so also alleviates pressure for the Chinese STEM (Science, Technology, Engineering, and Mathematics) majors to find employment in the market economy sector.

As another example, the word “economics” in traditional Chinese culture came from Bao Puzi’s (Jin Dynasty, 243-343) “manage worldly affairs (经世) and help the people (济民),” which emphasized the managing role of the political state in economic affairs as opposed to promoting a free market. This certainly is consistent with China’s economic system today. In other instances, JG workers in the cultural heritage preservation program can help document, interpret, recreate, and celebrate China’s traditional culture, philosophy, and multiethnic heritage. It is through these efforts that cultural heritage preservation jobs help promote confidence in the Chinese path, system, theory, and culture within the Chinese society to achieve a balance with the western cultural hegemony brought by globalization.

The third type are a broad category of jobs that serve public purposes in general. This certainly includes the more traditional infrastructure constructions (such as high-speed railroads). It also includes quality-of-life-enhancing activities that are underproduced by the market. Forstater, Kaboub, and Kelsay listed the following examples: 1) data gathering, as JG workers can be hired to gather data to inform better policymaking; 2) support the operations of the JG program itself, as “some Job Guarantee workers can be hired to provide transportation, childcare, elderly care, community meals, or any other services needed within the Job Guarantee program”; and 3) upgrading China’s existing charitable infrastructure by “transforming from one that primarily relies on volunteers with minimal experience to... organizations that employ professionally trained full-time staff to support the specific mission of the organizations [that are] assisting pilgrims, the elderly, people with disabilities, low-income families, orphans, emigrants, and victims of domestic violence” (Forstater, Kaboub, and Kelsay 2015).

c) A Gradualist Approach to Implementing the Chinese Green JG

Inspired by Fagg Foster’s theory of Institutional Adjustment, I propose a two-phase gradualist approach for the Chinese state to implement the Chinese Green JG. Foster’s theory of Institutional Adjustment has three components – instrumental primacy, recognized interconnectedness, and minimal dislocation (Foster 1981). The significance of Foster’s theory lies in the fact that while organizations can change overnight, institutions as habits of thought and routines of behaviors cannot (Kaboub 2007). Therefore, to successfully implement a public policy, policymakers must be aware of their own ignorance of the proposed policy and social reality (i.e. instrumental primacy); policymakers must recognize all interconnected institutions that need to be adjusted when implementing the policy (i.e. recognized interconnectedness); and policymakers should implement the policy in a way that causes minimal dislocation to the existing institutional structure (i.e. minimal dislocation). Hence, Foster’s theory of Institutional Adjustment is a gradualist and pragmatist approach to public policy, which has astounding similarities to the Chinese state’s reform gradualism and reform pragmatism after 1978, as I elaborated in my first essay.

Therefore, even though a Green JG makes sense economically, politically, socially, and environmentally and the Chinese central government faces no financial constraint to finance it, it is a new public policy that tests the organizational capabilities of the local governments as well as

the coordination capabilities among different levels of governments and ministries in China. Given that different localities in China face different economic, labor, and environmental realities and that the local governments in these localities exhibit different levels of competency in organizing and administering a program like the Green JG, it is sensible to select representative regions to experiment the Green JG before rolling it out as a national economic policy. Initial evaluations of the JG programs can also be done during this phase.

The successful administrators of the JG program during phase one, including local and provincial officials, can then serve as mentors to help guide other localities and provinces. For example, as the Ningxia local government's ecological migration program possesses a few features of the JG program (Li 2013), it would be reasonable to include Ningxia in the first phase of Green JG. Then, lessons and experiences can be learned and shared for other regions like Ningxia to be implement in their JG programs.

Again, it is important to emphasize that the above “experiment, evaluate, and expand” two-phase approach is consistent with Foster's theory of Institutional Adjustment and the Chinese state's reform gradualism and pragmatism in shaping China's socialist market economy since 1978. Since China is a large country with roughly 20% of the world population, any benefits or mistakes in the national policy level have far-reaching consequences. Hence, a reasonable amount of caution is warranted. More importantly, a gradualist approach allows the Chinese state to figure out the best practices concerning the implementation of a Chinese Green JG. Promoting best practices is certainly a much more pragmatic approach than having all local governments try adopting the Green JG at the same time. Finally, a gradualist approach to implementing the Chinese Green JG gives Chinese governments at all levels the time necessary to develop organize, coordinate, and evaluate their capabilities and experiences for the successful implementation of the Chinese Green JG.

Conclusion

In this paper, I propose a Green Job Guarantee for China to coordinate its goals in economic growth, employment, structural adjustments, and environmental sustainability. My key findings are as follows:

First, conventional macroeconomic policies are inefficient at creating jobs by stimulating economic growth, due to labor-displacing technical change. Based on Chinese Premier Li Keqiang's estimation in 2013 that 1% GDP growth generates 1.5 million more jobs, China's GDP would have needed to grow for an additional 16% to eliminate the 24 million urban unemployment figure in 2019. This unrealistic requirement precisely demonstrates the difficulty of translating GDP growth to job growth using conventional economic stimulus policies in a world that is increasingly automated and capital-intensive. A Job Guarantee, on the other hand, is more effective in stabilizing employment because it directly creates jobs, which then organically promote economic growth. As I demonstrate, a Chinese JG only “requires” the GDP to grow for an

additional 3.13% - 4.55% to eliminate China's 24 million unemployment figure in urban areas. Other advantages of a JG include reducing policy instability (since JG is a countercyclical macroeconomic stabilizer that automatically expands during economic downturns and contracts during economic booms) and complementing, rather than replacing, the market economy.

Second, China would especially benefit from a Green JG. This is because a Green JG can promote China's economic and employment growth while enhancing the Chinese state's ability to implement the Supply-Side Structural Reform, counter trade wars and international protectionism, cope with the slowdown in China's population growth, transition the Chinese economy to domestic consumption-based, increase the effectiveness of its deficit spending, and resolve contradictions between economic growth and environmental sustainability. Moreover, a Chinese Green JG allows the Chinese SOEs to focus on operational efficiency and international competitiveness.

Moreover, China's time to implement a Green JG is ripe. First, the Green JG's ability to address the structural defect of a market economy – persistent and structural unemployment – qualifies it to contribute to and to benefit from China's pursuit of a socialist market economy with Chinese characteristics. Unlike countries that follow liberal democracy and market capitalism, China faces no significant political or ideological obstacles to implementing a socialist policy like the Green JG. Further, a full employment socialist market economy has every reason to be confident in its path, theory, system, and culture. Second, China's environmental policy climate since 2005 has sought synthesized environmental-economic policies to address the contradiction between economic growth and environmental sustainability. The Green JG qualifies as such a policy to promote both full employment *and* environmental sustainability. Third, there have been abundant empirical lessons from a variety of foreign, domestic, formal, and informal adoptions of JG programs. China can learn from these experiences. Finally, the Chinese central government possesses monetary sovereignty, which is a key economic condition for implementing a JG program via deficit spending.

Afterwards, I show that a Chinese Green JG makes economic sense by calculating its economic benefits and costs. With an overall conservative approach and by using the “average product” method and the “Okun's Law” method, I found that the economic benefit of having a fully-fledged Chinese Green JG in 2019 is between 3.13% and 4.55% of China's 2019 GDP. Assuming an average JG wage of 3700 RMB per month, a worker's benefits package worth 35% of the total wage bill and a materials and logistics cost worth an additional 10%, the total cost of implementing a Chinese JG program in 2019 is 1.58% of China's 2019 GDP. This means that increasing China's fiscal deficit by another 1.58% of China's 2019 GDP would have eliminated China's 24.27 million unemployment and created a full employment Chinese economy with a GDP growth rate between 9.23% and 10.65% in 2019. In order to make a more compelling economic case, in my calculations I did not account for many other benefits of a Green JG, such as its contribution to economic, social, and political stabilities and environmental sustainability. I also overestimated the true cost of a JG program since a full employment Chinese economy should see reduced spending on

unemployment insurance and crime prevention as well as the increased tax revenue arising from JG workers' consumption.

Since a Chinese Green JG entails increased deficit spending for the Chinese government, I examine the sustainability and functionality of Chinese government deficits (and government deficits in general) by constructing and examining sector balances for three representative countries – China, the U.S., and Greece. My conclusion is that the Chinese government deficits to fund the Green JG are not only sustainable but also functional.

After demonstrating the financial viability of a Chinese Green JG, I theorize the design of it. In terms of administering the JG program, my conclusion is that a Chinese Green JG should be funded and supervised by the central government and administered by the provincial and local governments. Furthermore, should the Chinese state adopt a gradualist approach to implementing the Green JG, military veterans could be prioritized in the initial hiring process. In terms of the types of jobs appropriate for a Green JG, the principle is that the jobs created through a Chinese JG program should be flexible through time to address the evolving deficiencies in the Chinese market economy. At any point in time, a JG program should create jobs in areas that are important and urgent but have been neglected by the market due to the lack of profit opportunities. I thus proposed three categories of JG jobs that I believe would be feasible and beneficial to the Chinese economy and society today. They are the Green Corps Jobs, the Cultural Heritage Preservation Jobs, and other Public Purpose Jobs.

Finally, following Foster's theory of Institutional Adjustment, I argue that a Chinese Green JG should be implemented in a gradual and pragmatic manner. This is because a Green JG would be a new public policy that tests the organizational capabilities of China's local governments as well as the coordination capabilities among different levels of governments and ministries in China. A gradualist approach thus allows for time for the Chinese governments at all levels to develop, organize, coordinate, and evaluate their capabilities and experiences that are necessary to implementing the program successfully. A gradualist approach also allows the Chinese state to experiment, evaluate, and expand the best practices to implement a Green JG before rolling it out as a national policy.

In conclusion, a Chinese Green JG is needed because it addresses the deficiency of China's market economy by hiring the currently unemployed workers to achieve public purposes and, in the process, put income into the hands of JG workers to stimulate domestic demand and promote economic growth. It begins with creating public sector employment to achieve public purposes and ends by stimulating the market economy to promote economic growth. Here is the bottom-line. I have shown that a fully-fledged Chinese Green JG costs 1.58% of GDP. I have also shown that a Chinese government deficit equaling 1.58% of GDP to finance the Green JG is sustainable and even functional. The question then becomes how much GDP growth will be stimulated as the result of full employment. My estimation is that a fully-employed Chinese economy will yield an additional 3.13% to 4.55% of GDP, which would bring China's 2019 GDP to the 9.23% to 10.65%

range. If the GDP growth ends up being higher, excellent. Even if it is lower than my estimation, say, 2% (it is highly unlikely that eliminating China's 5.2% urban unemployment figure only contributes to 2% of GDP growth), it is still well worth having a Green JG that brings economic security to the 280 million Chinese peasant workers and military veterans by hiring them to build a green (green jobs), confident (cultural preservation jobs), and comfortable (other quality-of-life enhancing jobs) China. A green and full employed Chinese economy is the best testament of a socialist market economy with Chinese characteristics.

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