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# **Investment, Deficits, and the Transition from Feudalism to Capitalism: An Exploratory Heterodox Analysis and Conjecture**

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## **Abstract**

Investment in capital, new technology, and agricultural techniques has not been considered endeavors worthwhile in a medieval economy because of a lack of strong property rights and no incentive on the part of lords and barons to lend money to or grant rights peasant farmers. Therefore, the medieval economy and standards of living at that time often have been characterized as non-dynamic and static due to insufficient investment in innovative techniques and technology. The capital investment undertaken typically would have been in livestock, homes, or public investment in canals, bridges, and roads, although investment in the latter would have been hindered by a fragmented political system of fiefdoms and lack of a unified national government. During the mercantilism era, these conditions are claimed to have improved, although much investment and economic activity are deemed to center around trading and small producers. This paper attempts to demonstrate empirically that a productive and sufficient level of public and private investment out of accumulated capital income, taxation, and rents does not have a real impact on economic per capita growth until around the 1600s in Britain perhaps due to the beginning of a strong, central government, increased property rights as well as to the level of capital, tax, and land income achieving an adequate threshold amount. This would also be about the time of capitalism's ascent as the dominant economic system in England. Even then, dramatic increases in investment and economic growth do not appear until the late 18<sup>th</sup> Century when investment as a share of the economic surplus reaches a sufficient threshold. According to the heterodox economics and exploratory analysis done in this paper, the types of investment, threshold amounts of investment out of profits and rents seem to matter when it comes to a growth path raising GDP per capita and net national income to higher levels.

**JEL Codes:** B51, E11, E12, N13

**Keywords:** Baran Ratio, Baran multiplier, Brenner Debate, capitalism, Dobb-Sweezy Debate, feudalism, Keynesian multiplier, socialism, technology

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## Introduction

Early economists were among the first to note how many business establishments and ventures took part or all of the proceeds of their profits and used them to buy more property, plant, inventory, and equipment if opportunities to expand and earn greater profits existed. This was in contrast to the way that most economic entities operated during feudalism, an economic system that was generally characterized as one that lacked the incentives or property rights to encourage producers to re-invest in or add to their productive capital (North and Thomas 1971 and 1973, McCloskey 1972, Brenner 1976 and 1985, Dimmock 2014). Since the serfs who worked on feudal manors had weak or little ownership in the lands they worked, their livestock, and the tools they used, there was little incentive to use any gains from their work to try to expand their efforts and output.<sup>1</sup> This was especially true during the early middle ages. Any production above a level of subsistence for the peasant farmers and their families went to lords and barons as surplus, and therefore efforts to invest or innovate were not worthwhile. There was also little incentive for the lords to encourage the serfs to reinvest and innovate since the lords could often coerce and gain more output from them through simple intimidation and brute force (Dobb 1947, Brenner 1976 and 1985). Additionally, any surplus extracted from the feudal economy was believed to be wasted mostly on “unproductive” expenditures by the aristocracy on large palaces, court jesters, minstrels, the military, and cathedrals, or items which did not create use value or expand the productive capacity of a society by increasing the productivity of a labor force (Baran 1953 and 1957, Engels 1957, Smith 2000).

Acemoglu, Johnson, and Robinson (2004) and Acemoglu and Robinson (2012) argue that political institutions shape economic outcomes as opposed to the general Marxian view that economic and material circumstances mostly determine political and social institutions. They argue that the ownership of key resources is enabled by legal and political institutions which in turn dictate the dominant mode of

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<sup>1</sup>Sato (2018) points out that claims and rights to land and land usage were multi-layered under feudalism with lords holding political power over the land while serfs and other commoners of lower classes had rights to use it for subsistence farming, fishing, etc. as long as they shared in the proceeds of their harvests and catches. He argues that it is not until under capitalism that land becomes a commodity and then ownership and rights to land revert to just one person or group of owners who are part of one social class. Multi-layered ownership along class lines cease to exist.

production. Therefore, according to them, the lord's or baron's legal or political control over land and water and water mills gave rise to serfdom and feudalism rather than small scale subsistence farming leading to or reinforcing the system of demesnes and feudalism. The purpose of this paper is not to examine which comes first or which is more important but to look at the changes in economic circumstances over time while noting some important historical developments in English and British history.

Feudalism was weakened due to less and less arable land being available for food production, the trauma of plagues and famines<sup>2</sup>, and these in turn caused labor shortages and rising labor costs. As agricultural production could not keep up with increases in population due to shortages of arable land, small petty producers, merchant traders, and yeoman farmers started taking some of the surplus they earned and reinvested it into their operations to finance greater productivity and expansion (Brenner 1976 and 1985, Heller 2011, Dimmock 2014). As Colander (2020, 73-75) and others have claimed, some time during the 15<sup>th</sup> Century mercantilism evolved from feudalism thanks to the growth of markets, trading, urban areas, global exploration and a larger presence of the government in economic activities through its sanctioning of guilds and sponsorship of exploration. Finally, it was probably not until the Industrial Revolution and the ascendancy of manufacturers and major commodities producers that capitalism fully replaced mercantilism, although farming in some parts of Europe had already been transformed through innovation and greater investment and output (Heller 2011, 89, Colander 2020, 74-75).

This paper's empirical research found that it probably was not until the 1600s and through the 1800s, an era which roughly took in the time periods of the British slave trade, English Agricultural Revolution, the English Enclosure Acts, the English Civil War (Revolution), the Glorious Revolution, and the Industrial Revolution, that capital income, investment spending, and investment levels began to reach a critical threshold of a society's economic surplus, that is, a society's cumulative capital income and land

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<sup>2</sup> Which some have claimed were also caused indirectly by a mini-ice age (e.g, Fagan 2000, Blom 2019 among others).

income plus tax revenues (Baran 1957, Baran and Sweezy 1966, Xu 2019, Lambert 2020).<sup>3</sup> With this, standards of living dramatically began to advance in England and the United Kingdom (UK) with the greatest advances being made in the 1800s. Productive outlets for investment made themselves available at this time which helped per capita economic growth, although capital income had to rebound as a share of economic surplus and net national income after being lower for several prior centuries (1400s to 1600s). If data sources are correct (Clark 2009, Broadberry, et al 2015), capital income and economic surplus levels might have been higher in the 13<sup>th</sup> and 14<sup>th</sup> Centuries than in the next several centuries and did not reach higher levels again until the 1700s in Britain. See Figures 1 to 3. Money for investment was available in the late medieval period, but because of few incentives for productive investment, it was mostly wasted on what some consider unproductive pursuits, and therefore it had little if much impact on economic growth. It is granted that the building of cathedrals and palaces employs many people, yet these edifices do not in turn raise the current or future productivity of a nation's workforce. In the transition period of the 15<sup>th</sup> to 16<sup>th</sup> Centuries, investment levels would still be predicted to be low since capitalism was still not the predominant economic system as mercantilism and trading still reigned. High labor costs (Clark 2009, Humphries and Weisdorf 2019) for several centuries might have prevented the formation of a large enough economic surplus to justify investment too. In the 17<sup>th</sup> Century, the economic surplus began to grow again thanks to a growth in capital income and a lowering of wages, and these events led to the beginning of a more consistent and greater level of capital investment in mostly productive endeavors.<sup>4,5</sup>

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<sup>3</sup> Stanfield (1974) emphasized one of Baran's (1957) concepts of the economic surplus as potential output less essential consumption of a society to yield potential surplus. Without knowing or being able to estimate slack in the British economy from the 13<sup>th</sup> to 19<sup>th</sup> Centuries., this paper focuses on Baran's concept of the actual surplus, which is actual output minus essential consumption.

<sup>4</sup> Rimmer, Higgins, and Pollard (1971) assess the year-to-year rates of investment in the 18<sup>th</sup> and 19<sup>th</sup> Centuries in the UK and estimate it to be slower than other estimates and believe a lot of capital investment undertaken was due to the rapid deterioration of many forms of plant and equipment. They cite the frequency with which horseshoes and many farm tools had to be replaced. Nonetheless, such replacement was necessary to propel agricultural output to higher levels, and therefore the investment expenditures were still productive.

<sup>5</sup> The debate over productive versus non-productive pursuits and occupations can be traced at least as far back as Adam Smith (2000(1776)). In general, those commercial and governmental activities and occupations which do

(Insert Figures 1 to 3 around here)

This paper proceeds as follows. The next section, Data and Conjectures, describes the data sources used in the research for this paper, the definitions of key variables, and the displays of data. Finally, a Discussion and Conclusion section discusses the implications of the findings for historical and modern economic performance and prospects.

### **Data and Conjectures**

Clark (2009) gives estimates on a yearly basis for a GDP price index, estimates on a decadal basis of net capital income (net income from businesses, housing, live-stock, canals, mines, railroads, and so on), and estimates of the real rates of return to capital, and capital shares of national income for the years 1200 to 1860 for England and the UK. Adjusting capital income according to the price index and using the formula

$$r = \text{Real Capital Income} / \text{Real Capital Stock},$$

where  $r$  is the real rate of return on capital or capital share of national income, one can rearrange the formula and solve for real capital stock using

$$\text{Real Capital Stock} = \text{Real Capital Income} / r$$

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not add or help to create value in the production or distribution of products or services are considered unproductive whereas those that do add value are productive. In an enterprise, workers who design and create a product would be considered productive whereas cleaning and bookkeeping personnel, although important, would not really be considered productive. In classical political economy this was an important distinction, and it is still considered important to many heterodox economists. It has mostly been discarded, however, by mainstream and neoclassical economists.

which can provide some type of general estimates of total English and UK aggregate capital stock amounts over the years 1200 to 1860.<sup>6,7</sup> Figure 4 illustrates the growth of the estimated real capital stock over several centuries, and it is shown that growth in the real capital stock does not really begin to climb somewhat until the 17<sup>th</sup> and 18<sup>th</sup> centuries with accelerating growth in the 19<sup>th</sup> century. Estimated real annual net investment expenditures or change in the capital stock from one decade to the next show a similar pattern as displayed in Figure 5.<sup>8</sup> It appears that investment and capital stock amounts do not really begin to be substantive until the 1600s or 1700s, which according to many authors is about the time that capitalism becomes the dominant form of economic organization in England or the UK.<sup>9</sup> It is around 1770 to 1780 and beyond when investment begins to climb dramatically (Figure 5), a time period which corresponds to the rise of important textile innovations and their implementation in Britain (Caitling 1986).

For some years, real net investment is estimated to be negative perhaps because the depreciation of capital stock is greater than total investment or due to natural disasters, crop failures, economic recession/depression, or war. If some scholars are correct, then the amounts for net investment in productive pursuits should be small from the 13<sup>th</sup> to the 16<sup>th</sup> centuries but should grow from the 17<sup>th</sup> to the 19<sup>th</sup> centuries. In the earlier period, during feudalism, and in the subsequent transition period from feudalism to capitalism, economic incentives were either mostly nonexistent or weak whereas in the later

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<sup>6</sup> Admittedly this is assuming that the real rate of interest is a reward to capital based on capital's productivity, which is a neoclassical economics tenet applied to pre-capitalist and capitalist time periods. And this neoclassical tenet is a debatable concept since it does not address interest rate setting or targeting by lenders or other factors that influence interest rates. However, this is one way to estimate a long run time series of capital stock and investment spending over seven centuries absent data about savings rates or profit rates.

<sup>7</sup> Clark also gives the share of capital income in decimal form for each decade as well, and when this is used instead of his estimated real returns to capital, charts similar to those in Figures 4 and 5 are obtained. The author can provide these upon request.

<sup>8</sup> Brezis (1995, page 57) gives estimates from Feinstein (1978, 1981) and Feinstein and Pollard (1988) of nominal investment in the UK from 18<sup>th</sup> to 20<sup>th</sup> centuries. Although different in magnitude from the estimates for this paper, for 1740 to 1860 the Pearson correlation coefficient between Brezis' estimates and the estimates for this paper is +0.933.

<sup>9</sup> The United Kingdom formally came into existence in 1707 thanks to the Treaty of Union between England and Scotland although the two states had been unified through a common monarch when James I (James VI of Scotland) became King of England around 100 years earlier (Macinnes 2011).

period they were much stronger. Much of the economic surplus of the 13<sup>th</sup> and 14<sup>th</sup> Centuries could have been saved or spent on military escapades, lavish churches, and/or palaces by the aristocracy.<sup>10</sup>

In the years where investment amounts are greater than the economic surplus, and this occurs mostly in the 18<sup>th</sup> and 19<sup>th</sup> centuries in the estimates, the differences in the amounts possibly can be explained by the macroeconomic equation

$$S + T = I + G$$

where S is national savings, T is national tax revenues, I is investment expenditures, and G is total local and national government expenditures (Lippit 1985, Branson 1989). Since Clark only provides indirect taxes in his data files, an estimate of real direct taxes is made using Clark's indirect tax revenue adjusted using his GDP price index (base year = 1860) values to predict real direct tax revenues using a regression model based on data on estimated direct and indirect taxes from O'Brien and Hunt (1999).<sup>11</sup>

Rearranging the previous equation yields

$$S + T - I = G$$

so that when approximated investment is taken from economic surplus (most of which is S), an estimate of total government expenditures outside of public capital expenditures can be made. This estimate is probably mostly composed of government operating expenditures since the estimate of I is based upon

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<sup>10</sup> This paper takes a Post-Keynesian/Kaleckian point of view that almost all wages or labor income is spent on consumption and that investment almost entirely comes from upper class income which mostly goes to savings or economic surplus (Lavoie 2009)

<sup>11</sup> Predicting their direct taxes using their indirect tax values follows a quadratic regression function which yields the best fitting equation. This equation without the intercept is used with Clark's (2009) indirect tax values to predict corresponding direct tax revenues. This paper cannot find why Clark has not estimated direct taxes other than his estimates of labor, rental, and capital income are all gross estimates and pre-tax. Clark asserts that indirect tax totals are small until late in the 16<sup>th</sup> Century and that records on taxes are hard to find before the 16<sup>th</sup> Century. It may be fair to speculate that direct taxes make up an even smaller portion of tax revenues during the 13<sup>th</sup> to 19<sup>th</sup> Centuries. Direct taxes such as national income taxes, wealth and gift taxes are not used to a large extent in England and/or the UK until toward the end of 18<sup>th</sup> and 19<sup>th</sup> Centuries to finance various wars and are not used on a consistent basis until the 20<sup>th</sup> century (Seely 1995, HM Revenues and Customs, 2010). The author can provide the output for the direct tax estimates as well as all data files used for this paper upon request.



Clark's rate of return on capital which includes return on public investment in tunnels, roads, bridges, and ports, and this follows national income accounting methods. Figure 6 displays estimates of English and UK government operating surpluses and deficits over the 1210 to 1860 period in which government spending is normally in surplus until the late 18<sup>th</sup> Century and beyond.<sup>12</sup> Much of this could be for military expenditures (Britain was in many wars and armed conflicts in the 18<sup>th</sup> and 19<sup>th</sup> Centuries), and data from Mitchell (1988, pages 578-580) shows a disproportionate amount of British net public expenditures from 1688 to 1801 to be for the army, navy, or ordnance with a low of 20% to a maximum of 96% and an average of 45%. Barro (1987) writes that most of Britain's deficits during the period of 1701 to 1918 comes from spending on wars with the exception of a budget deficit incurred to buy the freedom of slaves from slave owners in 1835-1836 and in a dispute over income taxes during 1909-1910. Barro's Figure 8 in his paper which plots public debt as a percentage of GDP looks very similar to Figure 6 in this paper because he mostly relies on the Mitchell data.<sup>13</sup> Finally Figure 7, using Mitchell's data, shows UK net public debt as a percentage of GDP from 1692 to 1860 accelerating during the 18<sup>th</sup> and 19<sup>th</sup> Centuries.<sup>14</sup>

Using investment levels or capital stock estimates from the Clark (2009) data, one can calculate a Baran Ratio (Xu 2019, Lambert 2020) which shows the amount of investment on a yearly basis that comes out of a society's economic surplus, which in this case is the sum of Clark's capital and land

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<sup>12</sup> The author could not find definitive sources for English and UK budget deficits and surpluses before 1800, although estimates of net public debt can be found from Mitchell (1988) and Chantrill (no date) that go back to 1692. The surplus and deficit estimates that are calculated in this paper have a +0.8825 correlation coefficient with the inflation adjusted debt (base year of 1860 using Clark's price index) estimates from Mitchell when correlated on a decadal basis from 1700 to 1860. As deficits increased so did corresponding debt levels. The furthest Mitchell's data goes back in time appears to be 1688, usually 1692.

<sup>13</sup> Interestingly one thing that Barro finds is that as long as currency could be converted to gold, money supply growth and inflation are not problems resulting from the budget deficits or the temporary rises in government spending mostly due to military spending. He claims that such deficits are associated with increases in long term interest rates, however, except for the deficits associated with the slave buy out and the income tax dispute. In those two cases, long term rates do not rise. Clark (2001) in estimating deficits from the 1720s to the 1830s finds no "crowding out" effects of British deficits. Figure A1 in the appendix also plots his estimates of real interest rates from 1200 to 1860.

<sup>14</sup> Esteban (2001) writes that the French wars would have been very difficult for Britain to finance had it not been for trade credits from India.

income estimates plus taxes collected by the state. If overseas borrowing is undertaken to finance investment (or perhaps a capital account surplus or treasure/loot from overseas exploration/conquest or war or trading in slaves<sup>15</sup> are used to finance it), then the Baran Ratio can be greater than one. Xu (2019) labels this the Baran Ratio since the economist Paul Baran (1953 and 1957) believes that capital formation comes out of the economic surplus. Simply put on a yearly basis,

$$\text{Baran Ratio} = \text{Investment} / \text{Economic Surplus} .$$

Xu (2019) believes that Baran's concept of the economic surplus is important in understanding investment in a capitalist economy because investment spending can only come from the surplus generated from labor. That is, profits, gains, and rents earned by owners or landlords and the taxes collected by a government come mostly if not entirely from the labor employed in capitalist enterprises or farms. It is not until the Baran Ratio reaches a critical and sustained level that economic growth and higher levels of development can be attained. This could mostly occur when capitalism becomes the dominant economic system thanks to greater property rights. Figure 8 displays the decadal pattern of the Baran Ratio, which as can be seen in the diagram does not begin to increase until late in the 16<sup>th</sup> Century. And it is not until after 1770 that the Baran Ratio shows consistent and substantive increases in magnitude, a period long after the proliferation of greater property rights brought about by the English Civil War / Revolution and the Glorious Revolution. Figure 5 shows a similar pattern when it comes to real investment amounts.

(Insert Figures 4 to 8 and Tables 1 and 2 around here)

Table 1 shows a Pearson correlation coefficient matrix among the variables real economic surplus per head, real investment per head, real government surpluses/deficits per head, the Baran Ratio, Clark's estimates of real income-based GDP per head, Broadberry, et al's estimates of real output-based

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<sup>15</sup> Richardson (1987) and Etlis and Richardson (2008), among other scholars, estimate that the British slave trade of the 17<sup>th</sup> to 19<sup>th</sup> Centuries had a big impact on British economic growth.

GDP per head and net public debt as a percentage of GDP (Mitchell 1988 and Chantrell n.d.) for the years 1200 to 1860. All coefficients are statistically significant at an alpha of 5% and show moderate to strong correlations. More importantly, the amount of real economic surplus per capita, real investment per capita, and the Baran Ratio are positively and moderately correlated with Clark's income based real GDP per capita measurement and are strongly and positively associated with the Broadberry, et al output based real GDP per capita estimates.<sup>16</sup> Real government surpluses per capita are negatively and moderately correlated with Clark GDP per capita estimates and strongly and negatively correlated with real investment per capita, the Baran Ratio and the Broadberry, et al real GDP per capita values. The greater the real government surplus (net total local and national tax revenues less spending), the lower real investment, the Baran Ratio and the lower the real GDP per capita on average. Conversely, the greater the deficit, the higher values of these variables on average.<sup>17</sup> Finally, net public debt as a percentage of GDP is strongly correlated with the economic surplus and moderately and positively correlated with the two measurements of GDP per capita, real investment, and the Baran ratio. It is inversely and moderately correlated with government surpluses/deficits in that larger deficits (negative numbers) correspond to larger debt percentage numbers which are all greater than zero.

Table 2 displays the Pearson correlation coefficients for the same variables for the period 1600 to 1860.<sup>18</sup> All coefficients have the same signs as in Table 1 and are statistically significant, yet the

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<sup>16</sup> There is of course a simultaneous relationship among many of these variables with investment not only leading to higher real output/income per capita, but the latter also leads to higher investment, consumption, etc., in turn. That is, a feedback loop exists among investment and output.

<sup>17</sup> The high negative correlation between investment per capita and government surpluses/deficits per capita is not surprising, of course, since surpluses/deficits were derived by taking the economic surplus minus investment estimates.

<sup>18</sup> Scatterplots and Chow tests (Chow 1960) show 1600 to be a point indicating some type of a break in the pattern of the data. Chow tests are done for bivariate, two stage least squares regression analysis, and these results can be provided upon request. Since data for net public debt as a percentage of GDP is available from 1692 and forward, the coefficients for it do not differ for those from Table 1. The Appendix shows scatterplots of both Clark's and Broadberry et al's measurements of output per capita as y variables with the other variables listed in Tables 1 and 2 as x variables. In some of these scatterplots a linear trend really does not develop until the x and y paired values reach a date either in the late 1500s or early 1600s. The year 1600 is also the year that Clark (2007) notes is a point of departure for Britain in showing gains in productivity and efficiency in its economy versus virtually no economic growth in previous centuries.

magnitudes of the coefficients are now larger and stronger. The only exception is for the net public debt as a percentage of GDP variable because it only has values from 1700 to 1860 as in Table 1. The results in Table 2 show that economic surplus per capita, real investment per capita, the Baran ratio, and the surplus/deficit per capita have a stronger impact during a period in which property rights were strengthened during the 17<sup>th</sup> Century and later. Yet perhaps more importantly during this period greater amounts from the economic surplus are reinvested into the British economy, and greater deficits and debt levels are undertaken by

Keynes discussed an investment multiplier and how it affected consumption and employment (248-249) and noted the consequences of savings being greater than investment in the macroeconomy resulting in less than full employment and stagnation. Or, in the minds of Sweezy (1942) and Baran and Sweezy (1966), and similar to Keynes (1964 (1936)), not enough of all of the economic surplus generated by an economy was absorbed by investment opportunities, and so the economy often tended toward recession or stagnation as

$$\delta I / \delta t > \delta C / \delta t$$

where the rate of consumption (C) over time (t) began to fall behind the rate of investment (I) over time (Sweezy 1942, 186-189). Some heterodox economists contend that Keynes argued that the disequilibrium between savings and investment as well as the gap between actual and full employment and between actual and potential real GDP could not only last in the short run but also into the long run and could be the usual state of affairs in a capitalist economy (Lavoie 2009, Marglin 2018) . If so, although we have no real records of unemployment or underemployment and potential real GDP in England and the UK during the time period covered in the research for this paper, and although feudalism and mercantilism are different economic systems than capitalism, it has been shown that the greater the level of investment expenditures and the greater the Baran Ratio, the greater the real GDP per capita and the greater the economic growth. The slow growth or no-net-growth or static Malthusian economic systems of feudalism and mercantilism perhaps could be argued to be a long run equilibrium that is

finally transformed by the right type and right levels of investment under appropriate institutional settings. Using an “old post-Keynesian” or Cambridge growth equation (Lavoie 2009, 108-109)

$$r = g / s$$

where “r” is the profit rate or rate of return to capital, “g” is the economic growth rate, and “s” is the propensity to save out of profits, and it is assumed that workers either do not save or save very little out of total savings, then rearranging we have

$$g = s*r$$

If it is assumed that savings = investment then “s” can be considered the Baran Ratio in this paper, and “r” is the return to capital estimated by Clark (2009). Calculating the growth rates over the centuries on a decadal basis and using the last formula, Figure 9 shows that growth rates do not really become that large and consistently positive in value until the late 16<sup>th</sup> and most of the 17<sup>th</sup> Centuries, the centuries during which capitalism supposedly becomes dominant. Prior to this time, growth rates appear to vary widely under feudalism and then tend to vary less so during the mercantilism era. Up until 1600, this paper estimates that the average growth rate is around 0%, and then thereafter, it is around 5.6% over the decades, which somewhat supports the econometric work of Crafts and Mills (2017). More so, the growth rate over the decades from 1780 to 1860 is around 10.8%.

(Insert Figure 9 around here)

### **An Example: Investing in Horses Versus Oxen**

As an illustration of how investment opportunities and levels of investment mattered during each time period, Figure 10 shows estimates for the number in millions of oxen and horses used in England and Britain from 1221 to 1496 and then from 1550 to 1870 (Broadberry, et al 2015).<sup>19</sup> Although the

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<sup>19</sup> The authors omitted the period of 1497 to 1549 because of a lack of historical records and difficulties in coming up with accurate estimates.

choice of and employment of horses or oxen by farmers had something to do with terrain and climate considerations (Langdon 1982 and 1986, Broadberry, et al 2015), a principal consideration was the cost of maintaining and keeping each type of animal (Langdon 1982 and 1986). Despite the versatility of the horse, oxen were cheaper to feed, and when no longer useful or when the price of beef was high, could be sold or used for food. Horses were sometimes considered a luxury during early medieval times, and so oxen with their low costs were usually preferred for tilling or plowing soil. It was not until the peasantry gained some independence and became somewhat innovative through producing for markets rather than just for lords; not until some farms became larger during the enclosure movement; and not until agricultural markets became larger and wider geographically during the 16<sup>th</sup> and 17<sup>th</sup> centuries that the horse became more useful despite its higher operating costs. The horse became more useful in not only farming but more importantly in hauling and transporting agricultural output to markets which had become geographically larger versus than what had existed under the old demesne system (Langdon 1982 and 1986). Langdon (1982 and 1986) argued that as some peasant farmers came to possess amounts of land and output and hence, greater affluence, they could afford to make the investment in the more costly yet more productive and multifaceted horse. In other words, their surplus had to reach a critical level before the horse became a viable asset.

In calculating Pearson correlation coefficients between the ratio of horse to oxen from 1221 to 1496 and the Baran Ratio and real annual investment for this period, Table 3 indicates little or no relationship between the two investment measurements and the ratio of horse to oxen. However, the relationships are statistically significant and fairly strong for the period 1550 to 1859 as would be expected to be following Langdon's reasoning for the ascent of the horse. Perhaps one scenario is that changing conditions in going from a mostly feudalistic to a mercantilistic and then to a mostly capitalistic economic system saw innovation and investment by yeoman peasant farmers, which in turn expanded markets further, and then this in turn led to greater income and investment opportunities by such farmers.

Economic traditions and conditions changed as did the level of investment associated with it to spur on economic development.

(Insert Figure 10 around here)

### **Discussion and Conclusion**

The results of this exploratory research paper are based upon estimates made from historical records reviewed by and extended by economic historians using different techniques. The data are examined through heterodox economic theories and points of view. One limitation of the results found in this paper is that during the time periods examined not nearly as many complete and thorough economic records existed then as they do in modern times. Some claim that Clark and his data are influenced by a Malthusian point of view of medieval times whereas Broadberry, et al see this time period as less stagnant. Yet, general estimates from these two of the most comprehensive sources of British economic history have to suffice in order to do any type of economic and quantitative analyses of the time period that covers the transition from feudalism to capitalism, although the data used is based upon after the fact reconstruction of certain events.

Nonetheless, if the estimates are reasonably accurate, the results found in this paper lend some credence to various arguments regarding the transition from feudalism to mercantilism to capitalism. That economic surplus, investment, investment rates, government spending and debt are largely ineffective or too small before the 17<sup>th</sup> or 18<sup>th</sup> centuries to impact standards of living or real GDP per capita is supported by the correlation results. This bolsters the work of Crafts and Mills (2017) which argues that trend growth in England and the UK up until the industrial revolution basically hovered around zero and support Clark's (2007) writings on how the general economic efficiency and productivity of the British economy was basically static until 1600.<sup>20</sup> As Clark (2001) noted, government deficits had

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<sup>20</sup> Graphs of real GDP per capita using the Clark and Broadberry et al data showed pretty much a flat line trend pretty much during both feudalistic and mercantilistic (or transition period) epochs.

no crowding out effects on the economy of the 1700s and 1800s, and one could speculate that the deficits actually had a “crowding in” effect on British economic growth given the results of the analysis of this paper.

One could also argue that the type and level of investment also mattered. If Baran is correct, then a lot of the economic surplus would have been wasted in the 13<sup>th</sup> and 14<sup>th</sup> centuries when feudalism was still the dominant form of the economic system. Even with feudalism in decline in subsequent centuries, some of the economic surplus may have been “wasted” by the aristocracy on cathedrals, palaces, and wars rather than spent on productive machinery and tools or on ports, canals and roadways. Various authors have noted that traders and merchants during the mercantilist era improved transportation technology but did not contribute much to changes in productive technology (Sweezy 1976 (1950)). As Brenner (1985) notes, medieval and mercantile era guilds, through their monopoly power, also frustrated investment in innovative techniques, and it was not until petty producers came along that this began to change. He also writes that until larger farms came about along with the development of large pastoral land holdings, it was difficult for many yeoman farmers to innovate on smaller parcels of land. Larger land holdings and more advanced farming techniques yielded greater economies of scale than the typical smaller, medieval farms that featured mostly subsistence style farming (Brenner 1985, Heller 2011, Cockshot 2019). Feudalism, mercantilism and their institutions only slowly gave way to capitalism as capitalism was built on the “ruins” of previous economic systems as those who were forced to leave common farm areas became the workers of the early manufacturers of the industrial revolution (McCloskey 1972, Marx and Engels 2004 (1848)). Property rights, investment, and global trade were established before the late 18<sup>th</sup> Century, but large gains were not seen in real GDP per capita until 1780 and beyond as this paper shows. Perhaps property rights are a necessary but not sufficient condition for economic development and takeoff. Just as important factors are the levels of public and private sector investments that need to reach a certain level before real economic growth occurs.



For those readers familiar with the Dobby-Sweezy debate (Dobb 1947, Sweezy 1976 (1950) among many other publications) as well as the Brenner debate (Brenner 1976, Brenner 1985, Heller 1985, Heller 2011 among many others), the statistical findings of this paper are probably not surprising since many of these authors note the stagnation of most of the medieval period and economic decline in the late medieval period in Europe. They also note the slow and gradual transition from feudalism to mercantilism and then to capitalism and the takeoff of economic growth with the agricultural and industrial revolutions. This paper's findings also somewhat support the writings of those who emphasize the importance of property rights for investment and economic advancement in that such rights were not strong enough for advancement until around the 16<sup>th</sup> and 17<sup>th</sup> centuries (North and Thomas 1971 and 1973, McCloskey 1972).

From a theoretical perspective, the investment spending alone and also as a share of the economic surplus probably resonated in the period of 1600 and beyond, especially 1780 and beyond, when the British textile industry took off because spending from surplus was not wasted as much as during feudalism and mercantilism and instead was invested in many of the new innovations introduced during the periods of the English Agricultural and Industrial Revolutions. Political and property rights reforms over the centuries such as those under Oliver Cromwell and from the Glorious Revolution also mattered. These innovations boosted average labor productivity (which helped to save on high wage labor expenses) which in turn boosted standards of living. The opportunities were perhaps fewer or almost non-existent in feudalism, and although mercantilism saw investment in large cargo vessels, ports, and increases in land holdings, these investments did not create as many other additional investment outlets and new markets as did manufacturers during the Industrial Revolution. The transportation, wholesaling and retailing industries along with the guilds during the mercantile era did not have as great of an impact on employment and productivity as did the rise of the industrialists. A manufacturing plant employed many people and depended upon supply networks which also typically employed large numbers of people. Some type of multiplier effect was probably able to attain an impactful result once such

innovations and industries with so many linkages developed. Finally, as classical economists like Smith and Marx and later the neo-Marxists Baran (1953 and 1957) and Baran and Sweezy (1966) noted, some forms of business could be claimed to be “productive” and others as “unproductive” or wasteful. They claimed that much of finance, retailing, wholesaling, advertising, military expenditures, R&D efforts on packaging and design, etc. in a capitalist economy are all wasteful and really do not contribute that much to a society’s economic net welfare. On the other hand, “productive” industries included those in manufacturing, mining, agriculture, education, etc. in which the populace gains something tangible and useful from the consumption of their products or services. Therefore, not only do innovation and investment matter, but also the type of investment in innovation (productive versus unproductive) could matter in addition to the property rights and strong national government presence needed to secure the rights of ownership and to profits.

Schumpeter in *Capitalism, Socialism, and Democracy* (2003 (1943)) noted how that the economies that preceded capitalism were like a circular flow system of trading of exchange that remained static and never really expanded. It was only with innovation under capitalism that the circular flow expanded and grew thanks to waves and cycles of innovation. For Schumpeter, early in capitalism entrepreneurs sought investment for their ideas in order to make a profit. In the *General Theory* (1964(1936)), Keynes indicated that job creation during an economic downturn could be done through unproductive activities such as burying treasury notes in bottles and having workers dig them back up again (129) although he conceded that it would be better to have people employed in more productive activities and through greater levels of some type of investment even if it meant the “socialization” of some investment. British governmental operating deficits and net public debt grew substantially probably due to military and warfare expenditures, which are unproductive uses of resources in some minds (Baran and Sweezy 1966, Mohun 1994, Lambert and Kwon 2015).<sup>21</sup>

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<sup>21</sup> Although Baran and Sweezy emphasized that it was World War II that eventually lifted the US out of the Great Depression and restored full capacity utilization and full employment.

Much has been written about the post-World War II economic boom in the United States and in other advanced capitalistic nations that lasted until around the 1970s. This lack of reinvestment could also be showing up in declining rates of productivity increases in the US economy and a usual and persistent gap between actual and potential real GDP since the late 1970s. Before the 1970s, the US economy often achieved or exceeded potential real GDP, yet afterward it often fell short.<sup>22</sup> Piketty and Goldhammer (2014), among others, notes that much of global inequality in modern times may be due to slow economic growth that favors owners of capital over workers. One way to remedy inequality is to have a global wealth tax that would put its proceeds to work in areas such as health care, housing, education and other human capital building programs. Wrenn (2010) argues that much of the economic surplus could be used to expand productive capacity throughout an economy since in a monopoly capitalistic society too much excess capacity always exists.

A lack of reinvestment would limit surplus absorption according to Baran and Sweezy (1966) unless more was spent on unproductive activities such as advertising, marketing, the industries of retailing or finance, insurance or real estate, etc. However, these activities do not increase the productive capacity of a society (just as feudalism's extravagant spending did not expand its capacity for output) and so may not help the long-term resiliency of an economic system through helping to develop it productivity and output per worker, which in turn help to raise its standard of living. If such productive reinvestment does not or cannot occur through private markets, then some Keynesian economists would argue that it can occur through greater governmental spending on public works, education, and health care. On the other hand, in order to raise worker productivity, government policy could also take a less generous stance by refusing to enlarge infrastructure and social welfare programs and by giving employers more leeway in extracting more work and less pay from their workers. The latter would be

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<sup>22</sup> Some have claimed that there can be too much investment and cite the former USSR as an example of a society which undertook too much investment at the expense of consumer goods. However, Cockshot (2019) disputes this and cites other works which claim that much of what was counted as investment in the USSR was actually military expenditures. In national income accounting, such expenditures are often counted as governmental expenditures.

somewhat akin to what the nobility often did to the serfs during the decline of feudalism. If capitalism has been struggling since the Great Recession to achieve greater levels of surplus absorption, then it has two alternatives. It can either allow for greater socialization of investment or it can engage in greater worker exploitation. The former implies a transition to a greater level of socialism within capitalism, the latter implies a course toward a certain degree of repression within a capitalistic system. Perhaps the transition from feudalism to capitalism illustrates that investing more of the surplus in the most productive ways (private or public) is the answer to increasing standards of living and economic growth for society.

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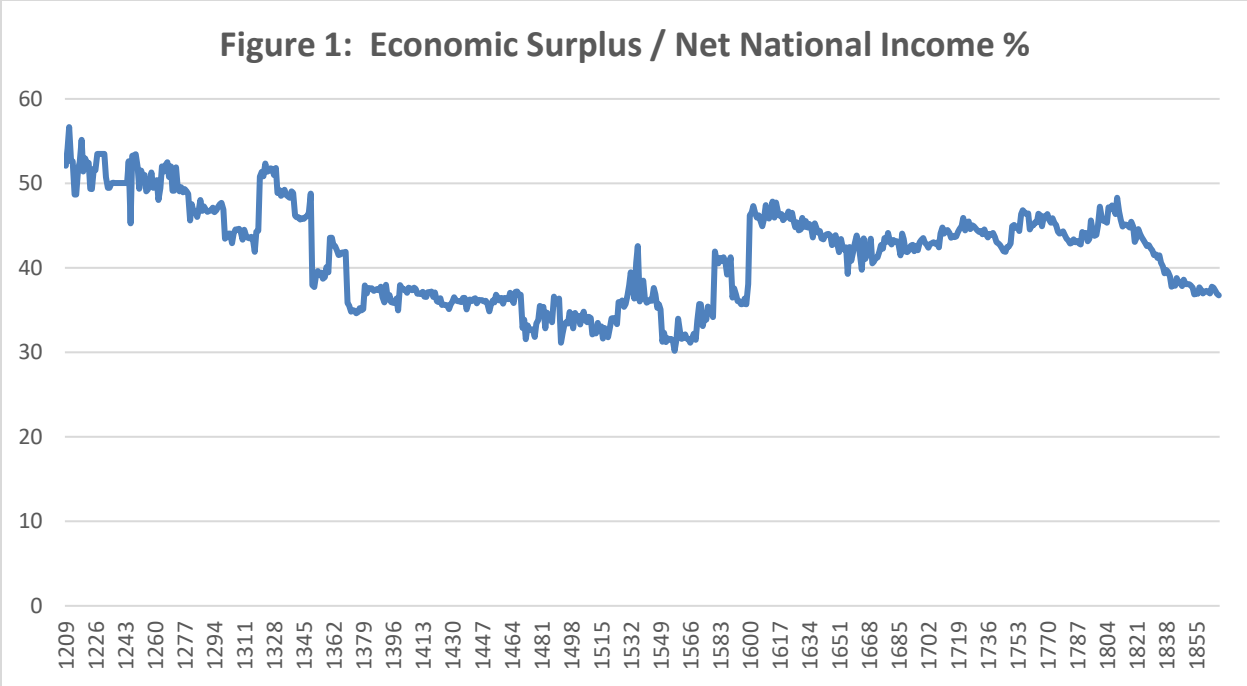
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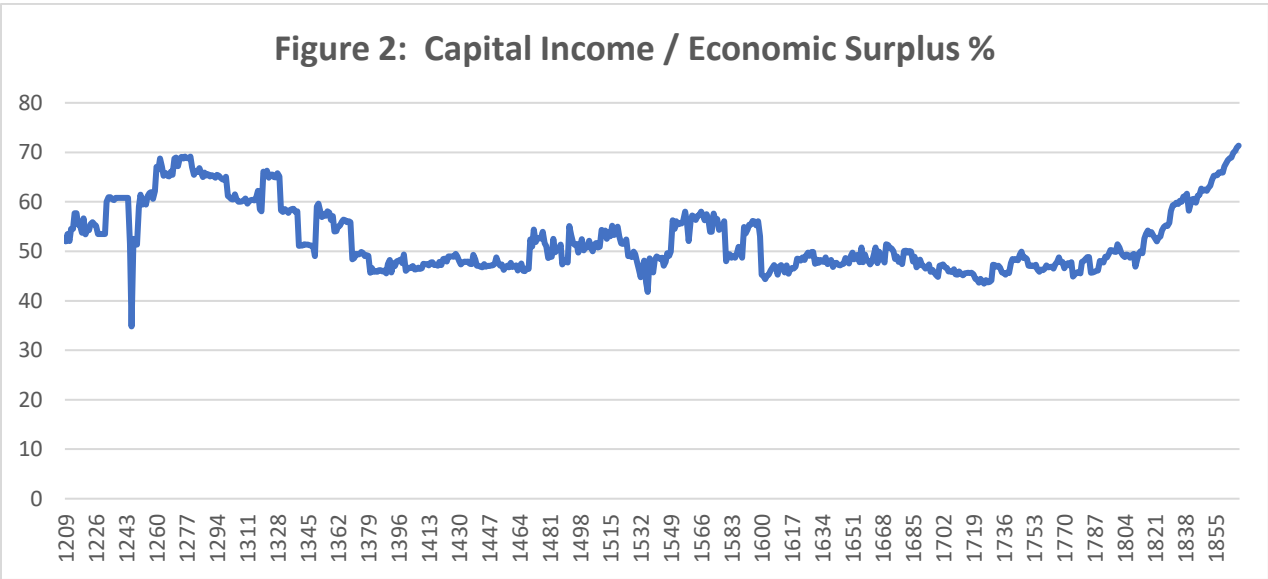
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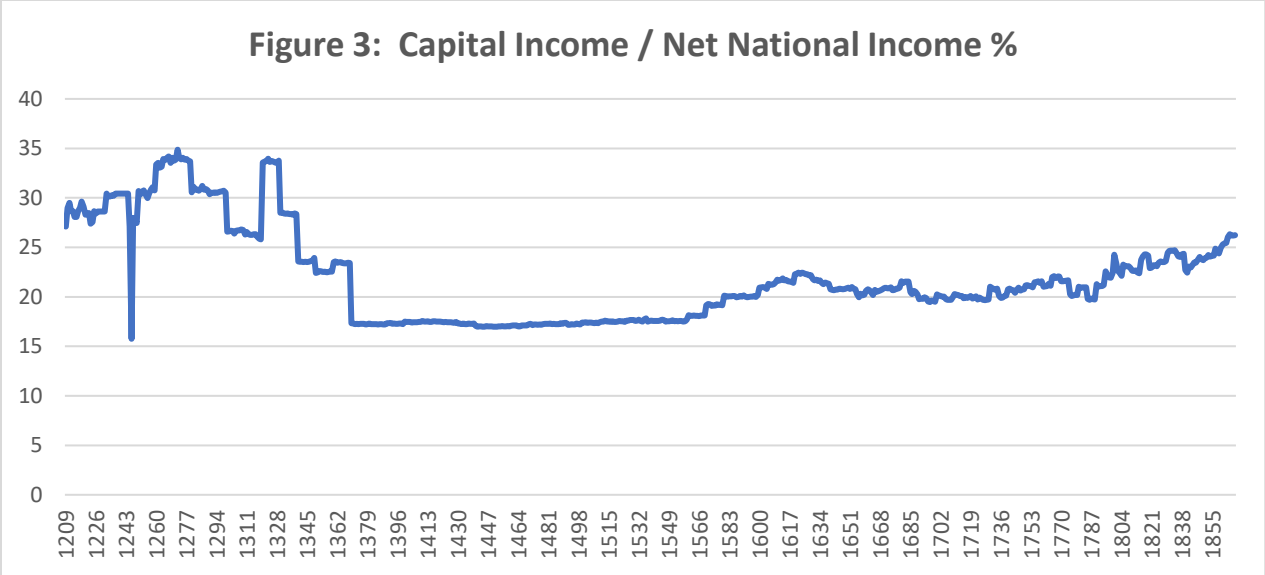




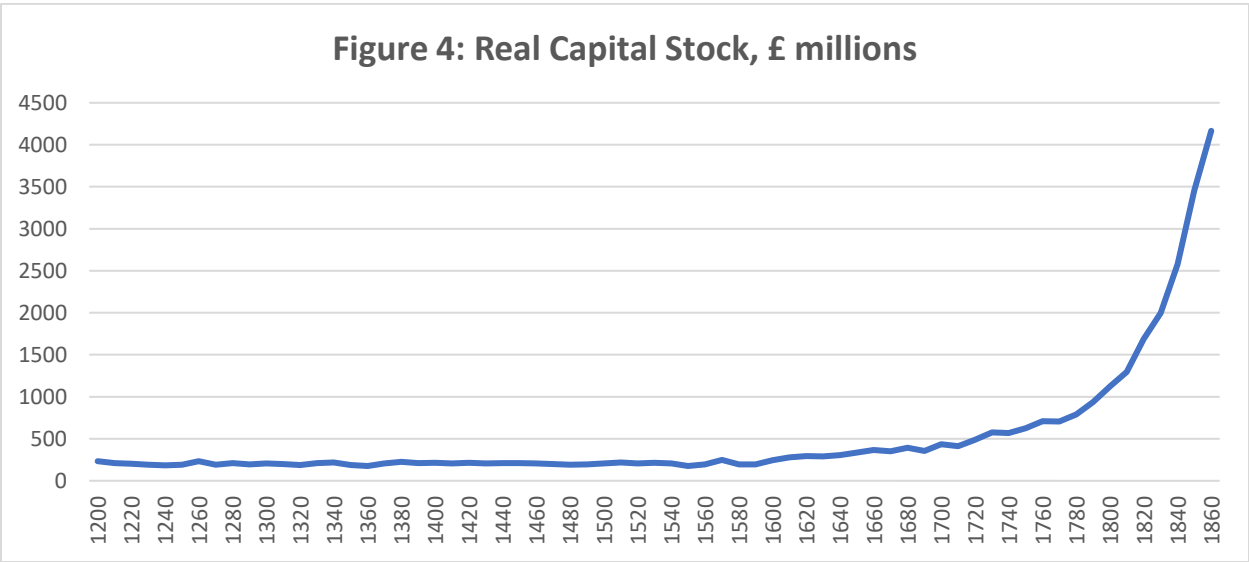
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Source: Gregory Clark, “National Income, Prices, Wages, Land Rents, Population, England, 1209-1869”, from his website, <http://faculty.econ.ucdavis.edu/faculty/gclark/data.html> .

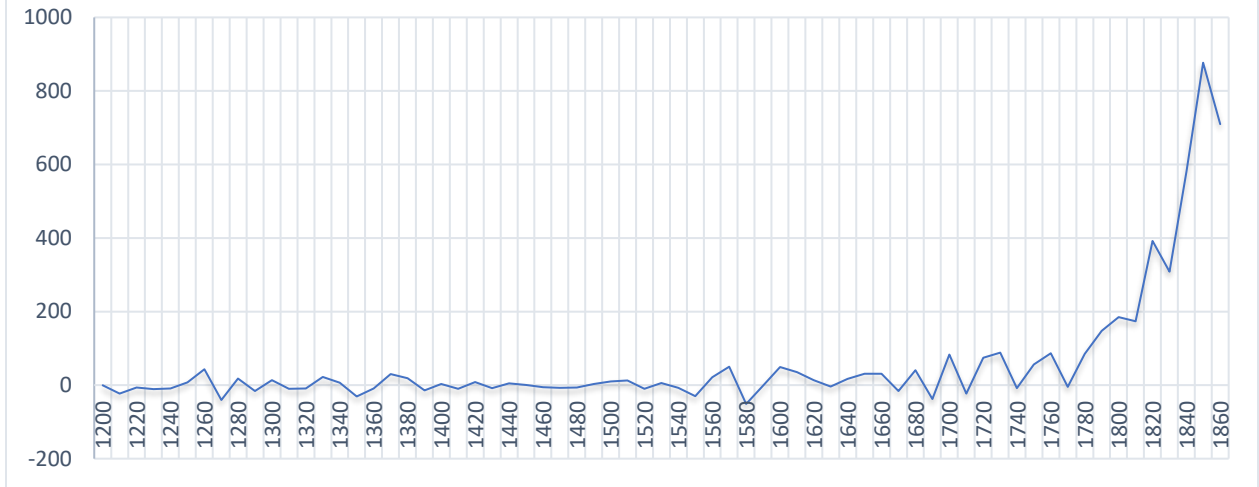


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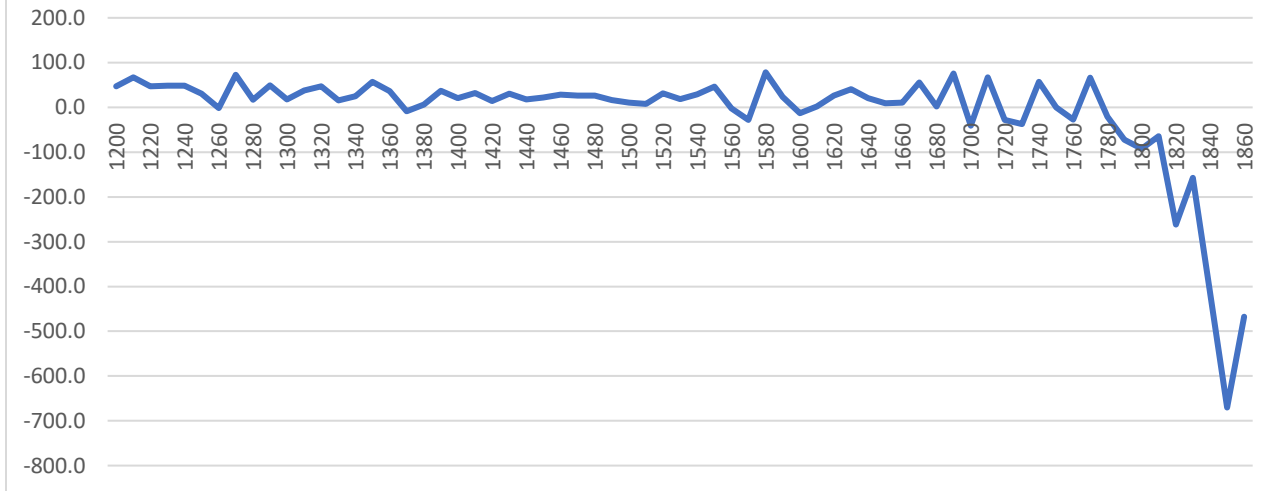
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**Figure 5: Real Investment, £ millions**

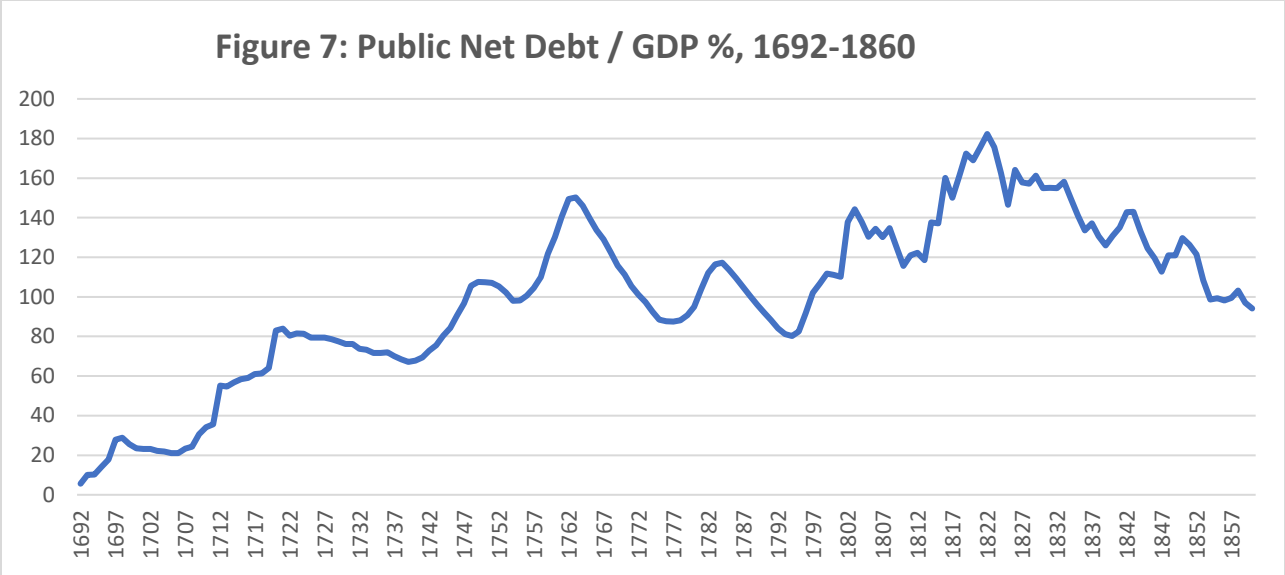


Source: Estimates based on Gregory Clark, “National Income, Prices, Wages, Land Rents, Population, England, 1209-1869”, from his website, <http://faculty.econ.ucdavis.edu/faculty/gclark/data.html> .

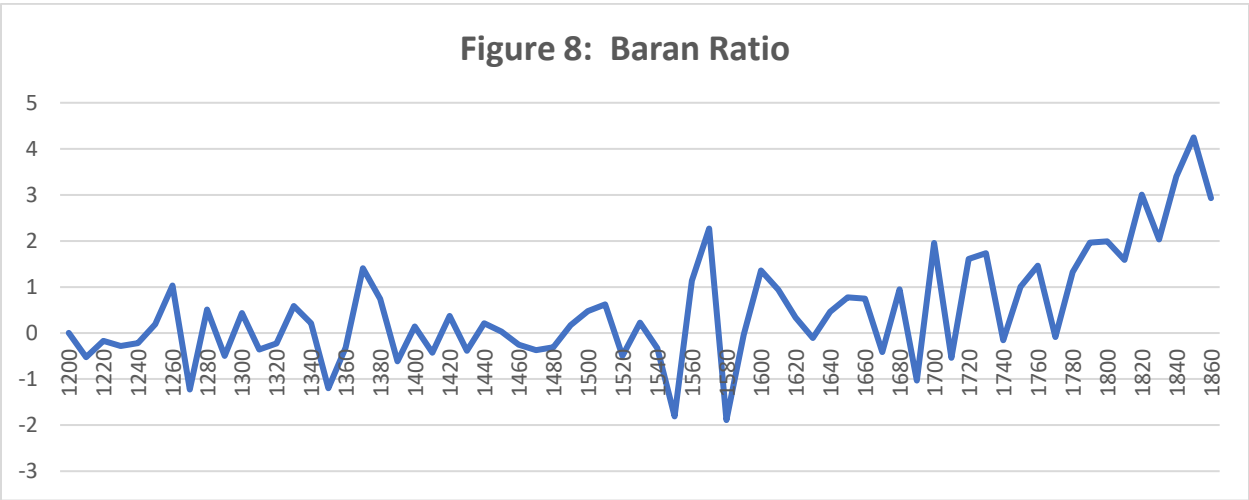
**Figure 6: Real Govt Deficit/Surplus, £ millions**



Source: Estimates based on Gregory Clark, “National Income, Prices, Wages, Land Rents, Population, England, 1209-1869”, from his website, <http://faculty.econ.ucdavis.edu/faculty/gclark/data.html> .



Source: From B.R. Mitchell, *British Historical Statistics* (1988) and Christopher Chantrell (no date) *UK Public Spending*, <https://www.ukpublicspending.co.uk/>



Source: Estimates based on Gregory Clark, "National Income, Prices, Wages, Land Rents, Population, England, 1209-1869", from his website, <http://faculty.econ.ucdavis.edu/faculty/gclark/data.html>.

**Table 1—Correlation Matrix for 1200 to 1860 Value**

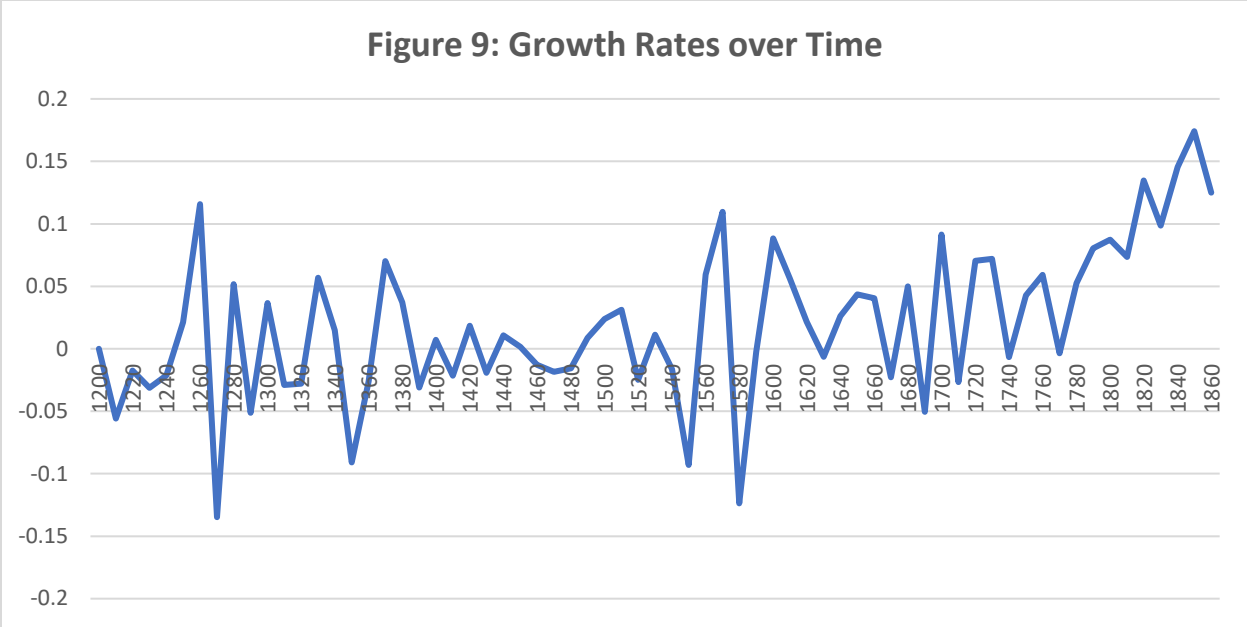
	Real Economic Surplus per Head	Real Investment per Head	Real Govt Surpluses/Deficits per Head	Baran Ratio	Clark Real Income per Head	Broadberry, et al Real GDP per Head	Debt/GDP Pct
<b>Real Economic Surplus per Head</b>	1						
<b>Real Investment per Head</b>	0.4357*	1					
<b>Real Govt Surpluses/Deficits per Head</b>	-0.2991*	-0.9892*	1				
<b>Baran Ratio</b>	0.3851*	0.9739*	-0.9698*	1			
<b>Clark Real Income per Head</b>	0.7312*	0.4032*	-0.3084*	0.3495*	1		
<b>Broadberry, et al Real GDP per Head</b>	0.7329*	0.8195*	-0.7875*	0.7304*	0.5295*	1	
<b>Debt/GDP Pct</b>	0.6900*	0.5386*	-0.5116*	0.5034*	0.5489*	0.4993*	1

\*p < 0.05

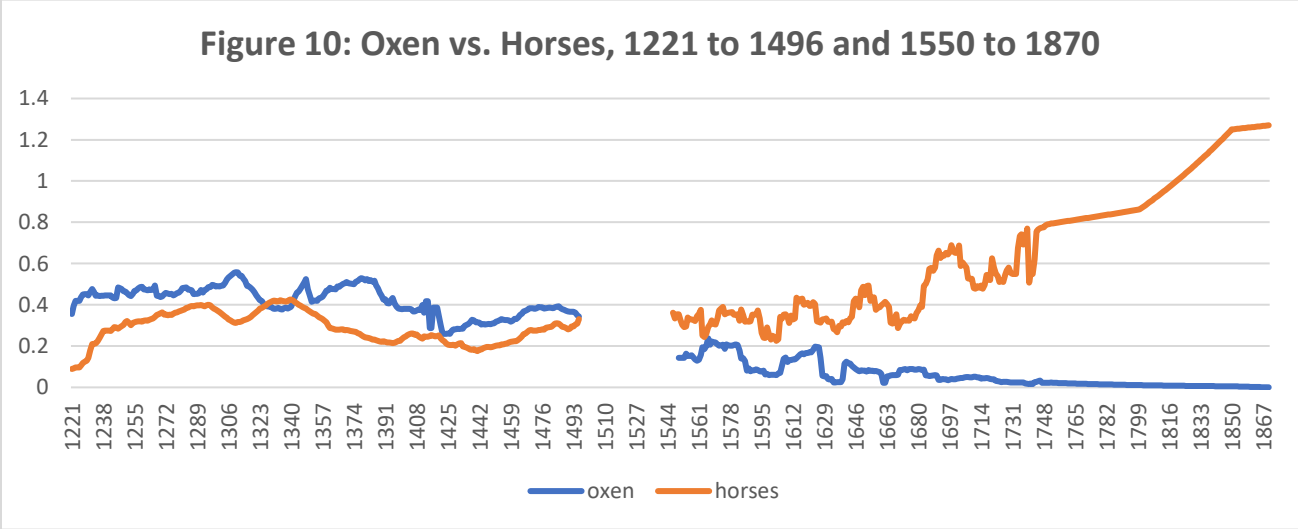
**Table 2—Correlation Matrix for 1600 to 1860 Values**

	Real Economic Surplus per Head	Real Investment per Head	Real Government Surpluses/Deficits per Head	Baran Ratio	Clark Real Income per Head	Broadberry, et al Real GDP per Head	Debt/GDP Pct
<b>Real Economic Surplus per Head</b>	1						
<b>Real Investment per Head</b>	0.8809*	1					
<b>Real Government Surpluses/Deficits per Head</b>	-0.8511*	-0.9982*	1				
<b>Baran Ratio</b>	0.8202*	0.9817*	-0.9856*	1			
<b>Clark Real Income per Head</b>	0.9605*	0.8779*	-0.8526*	0.8040*	1		
<b>Broadberry, et al Real GDP per Head</b>	0.9235*	0.8261*	-0.7998*	0.7455*	0.9699*	1	
<b>Debt/GDP Pct</b>	0.6900*	0.5386*	-0.5116*	0.5034*	0.5489*	0.4993*	1

\*p < 0.05



Source: Based on Clark data (2009)



Source: Adapted from Broadberry, et al (2015), Figure 2.01, page 54 and from the data from the website <https://www.cambridge.org/gb/academic/subjects/history/economic-history/british-economic-growth-12701870?format=PB> .

**Table 3—Pearson Correlation Coefficients for Horse to Oxen Ratio**

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	Real Annual Investment, 1221 to 1496	Baran Ratio, 1221 to 1496
Ratio of Horse to Oxen, 1221 to 1496	0.054	-0.028

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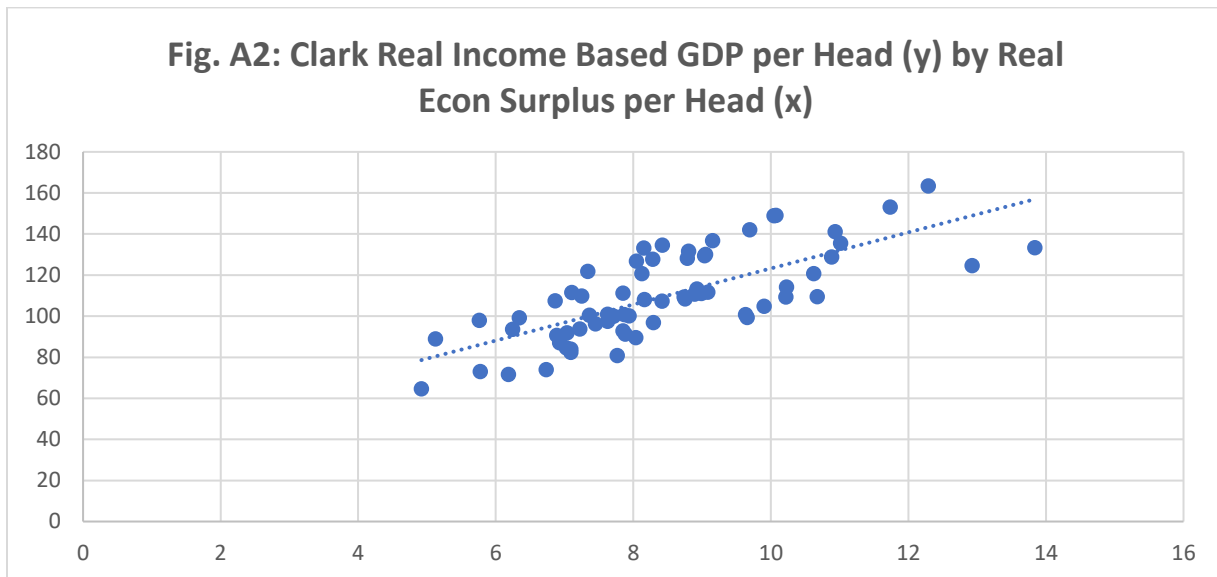
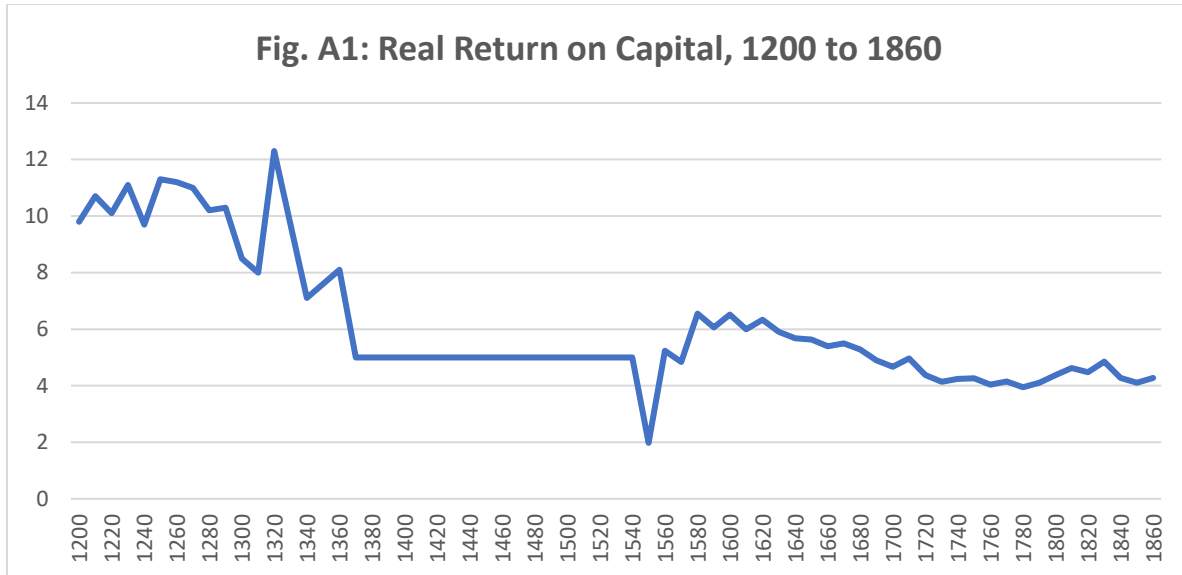
	Real Annual Investment, 1550 to 1859	Baran Ratio, 1550 to 1859
Ratio of Horse to Oxen, 1550 to 1859	0.93**	0.78**

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\*\*p<0.01

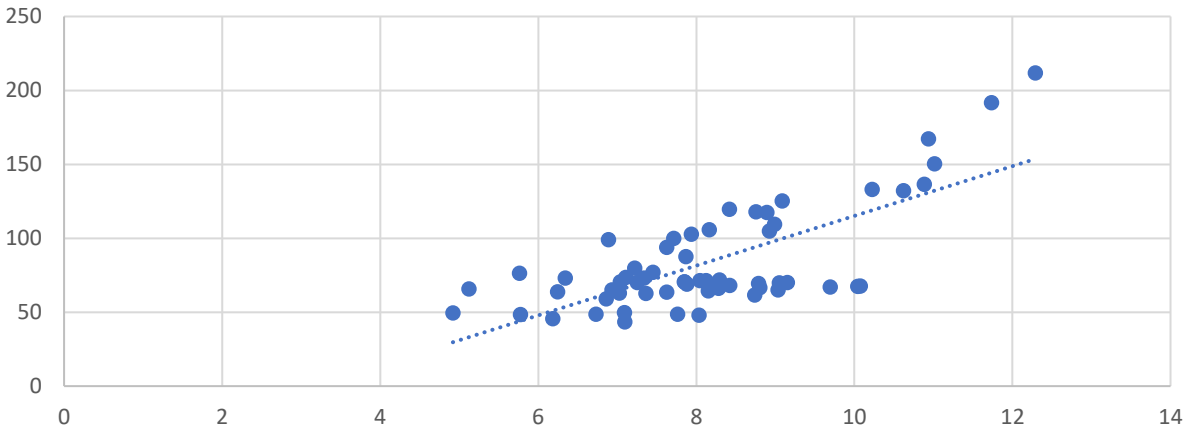
\*p<0.05

## Appendix

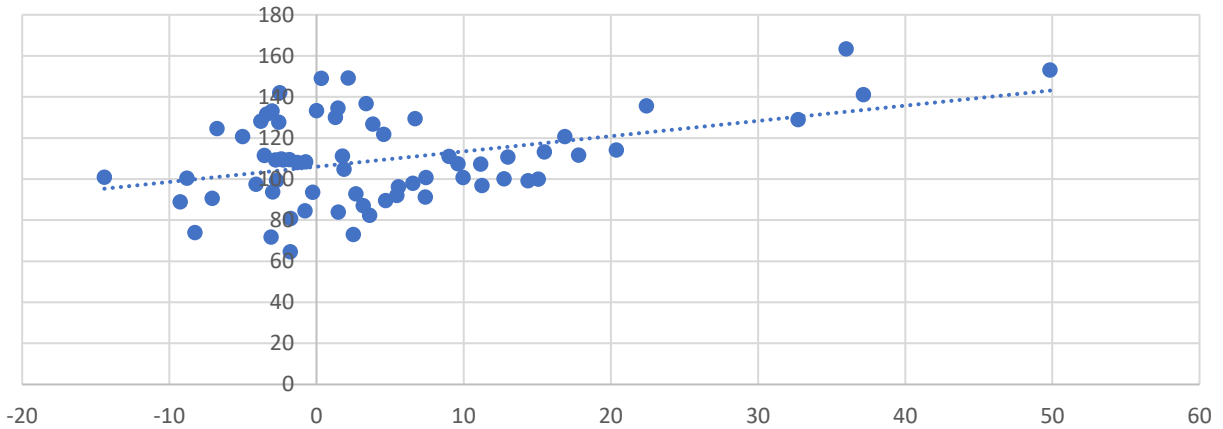




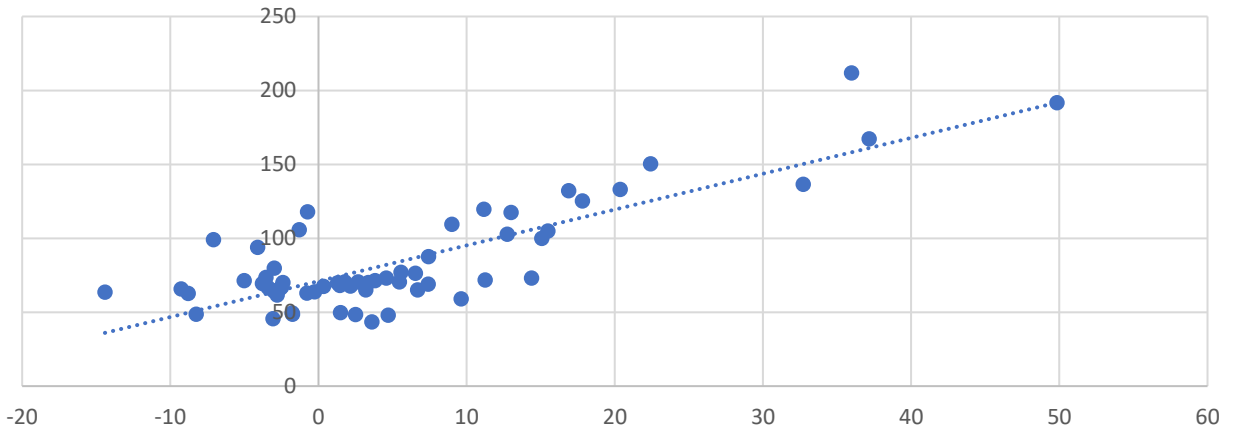
**Fig. A3: Broadberry, et al Real GDP per Head (y) by Real Econ Surplus per Head (x)**



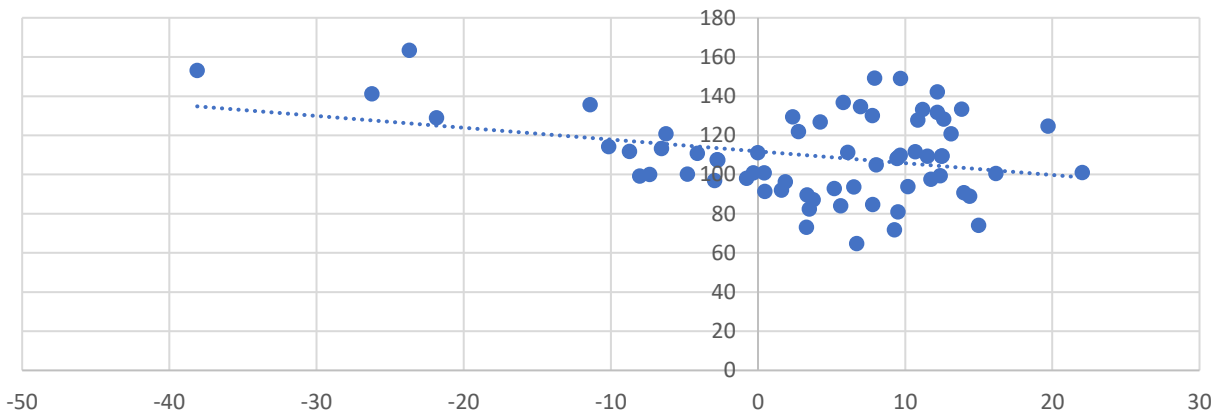
**Fig. A4: Clark Real Income Based GDP per Head (y) by Real Investment per Head (x)**



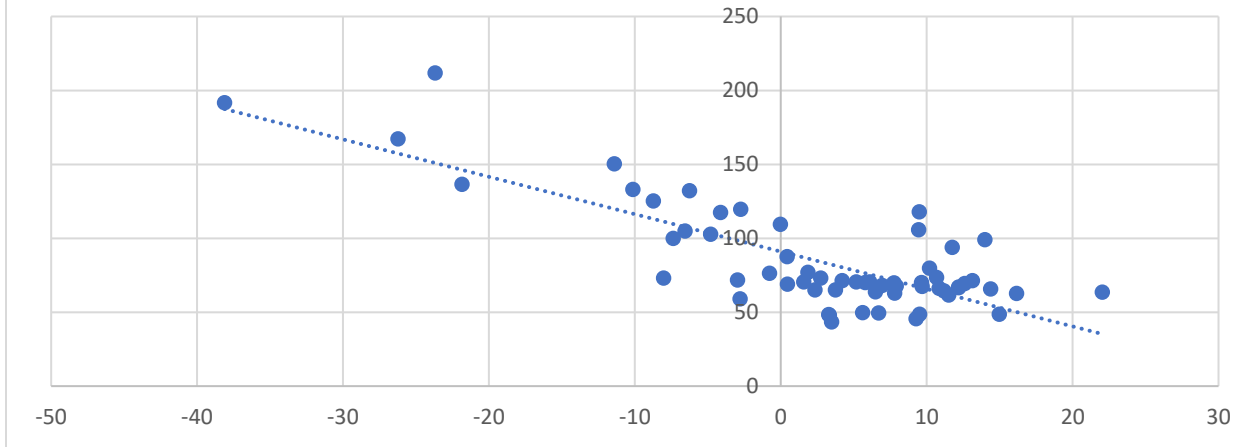
**Fig. A5: Broadberry, et al Real GDP per Head (y) by Real Investment per Head (x)**



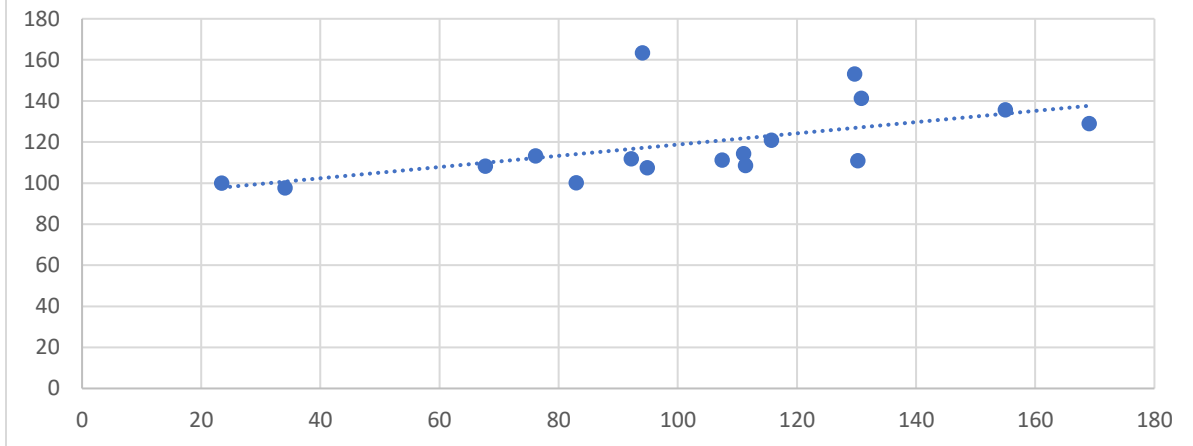
**Fig. A6: Clark Real Income Based GDP per Head (y) by Govt Surplus/Deficit per Head (x)**



**Fig. A7: Broadberry, et al Real GDP per Head (y) by Govt Surplus/Deficit per Head (x)**

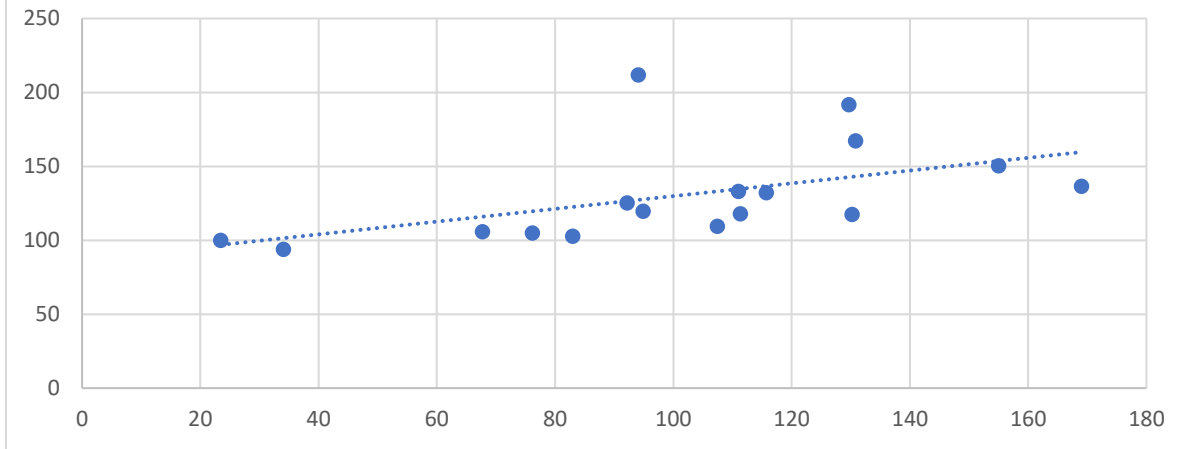


**Fig. A8: Clark Real Income Based GDP per Head (y) by Net Public Debt / GDP Pct (x), 1700 to 1860**



**Note:** Debt data was only available from Mitchell (1988) going back to 1692.

**Fig. A9: Broadberry, et al Real GDP per Head (y) by Net Public Debt / GDP Pct (x), 1700 to 1860**



**Note:** Debt data was only available from Mitchell (1988) going back to 1692.