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2017

Online at <https://mpra.ub.uni-muenchen.de/79807/>
MPRA Paper No. 79807, posted 20 Jun 2017 04:53 UTC

This article can be cited as: Braun, Eduard and David Howden. 2017. “The Rise and Fall of the Subsistence Fund as a Resource Constraint in Austrian Business Cycle Theory.” *Review of Austrian Economics* 30(2): 235-49.

It can be found at: <https://link.springer.com/article/10.1007/s11138-016-0347-y>

The Rise and Fall of the Subsistence Fund as a Resource Constraint in Austrian Business Cycle Theory¹

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Abstract: The “subsistence fund” was once an integral part of Austrian business cycle theory to indicate the resource constraint on the ability to complete investments. Early agrarian and industrial economies were constrained by resource availability in a manner consistent with that alluded to by the subsistence fund. This link became more tenuous as the growth of the financial economy in the 20th century removed the apparent importance of pre-saved goods to complete investments. At this point the subsistence fund came to be used only as a metaphor and was jettisoned from Austrian business cycle theory. The present paper points to the merits of the subsistence fund in explaining the turning point of the business cycle as compared to alternative explanations. It also works out the deficiencies in historical expositions of the Austrian theory based on the subsistence fund, and traces the evolution of the resource constraint at the core of Austrian economists’ treatment of the business cycle.

JEL Classification: B13; B25; E32

Keywords: subsistence fund; early business cycle theories; Austrian business cycle theory; wages fund

¹ Acknowledgements to be added...

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1. Introduction

The connection between the real and the financial sector is generally explained by the various monetary transmission channels. By determining the interest rate on the financial market, the banking system or the central bank are said to be able to influence consumption, investment, and the external balance and thus to impinge on aggregate demand (Boivin et al. 2011: 374 ff.).

Although it is generally acknowledged that the interest rate cannot and should not be manipulated at will, the idea that the financial market and the interest rate are themselves subject to real resource constraints, even in the short-run, is only rarely emphasized.

That there is such a real resource constraint which the monetary authorities should account for if they want to avoid major economic breakdowns has been argued most forcefully by the Austrian School since Ludwig von Mises formulated the Austrian business cycle theory (ABCT) (Mises 1912). While other schools of economic thought focus most of their attention on the nominal constraint caused by inflation in an overheating economy, the Austrian School's business cycle theory views the problem as entrepreneurs lacking access to a sufficient number of real resources to complete their investments. This theory, although it temporarily spread from Vienna to other centers of economic theory like the London School of Economics (Robbins 1934), was largely abandoned after the Keynesian Revolution.

Modern Austrian economists tend to argue that the marginalization of ABCT is due to ideological reasons: Keynes won the battle of business cycle theories in the 1930s because he offered policy-oriented solutions favored by politicians and applied economists. Even on a purely

theoretical basis, however, there are good reasons to doubt the relevance of the arguments for the existence of a real resource constraint presented so far by the Austrian School. Not only do the several explanations provided by Austrian economists differ substantially (Braun 2012), but they also do not exceed the stage of mere metaphors. There is no precise and comprehensive discussion of the resources that are supposed to constrain monetary policy and the consequent economic expansion in ABCT.²

The present paper has two goals. First, it locates and illuminates the limits and weaknesses of ABCT when it comes to pinpointing the relevant resource constraint. Second it reveals the still unexploited potential that lies dormant in at least some versions of ABCT. In accomplishing these goals, it concentrates on the role of the so-called “subsistence fund.” This concept, adopted by Mises ([1912] 1953) from Böhm-Bawerk ([1889] 1930), demonstrates best what the Austrians imply when they talk about resource constraints. It is also where they stop short in their analysis, and where there exist new starting points for a deeper discussion of the issue. It will become clear that the idea of a resource constraint on investment was relaxed even more in ABCT once the subsistence fund had been abandoned.

In section 2, we track the historical development of the subsistence fund. We demonstrate that it served primarily as a basic metaphor or placeholder for a deeper analysis of the process that turns savings into investments. Section 3 presents the largely unsuccessful efforts made by Wicksell ([1898] 1936), Mises ([1912] 1953), and Strigl ([1934] 2000) to go beyond the

² There are additional reasons to doubt the importance of the ideological explanation as the sole reason that Keynesian ideas took hold at the expense of the Austrian theory of the business cycle. As one referee points out, it is ironic to state that Keynes beat Hayek for ideological reasons when the Keynesian consensus subsequently lost some ground to the New Classical School which was more aligned with the arguments at the core of ABCT. Under this interpretation, the relevant elements of ABCT were incorporated by the mainstream and the incorrect or irrelevant elements were rejected. While there is debate as to what degree the mainstream view of ABCT is a “correct” interpretation (see, e.g., Salerno 2012), this paper does not intend to delve into this debate. Instead it sheds light on the difficulties encountered by Austrian economists in updating at least one element of ABCT – the subsistence fund – to the more modern, financialized, economy.

metaphor and to integrate the subsistence fund as a real variable into economic theory, especially business cycle theory. None of them was completely successful, leading the subsistence fund to be abandoned even as a metaphor in the framework of the ABCT, where it figured most prominently. In section 4, we demonstrate that this latter development is unfortunate for ABCT as it leaves it at a loss to explain why a boom should turn to a bust before a hyperinflationary boom sets in.³ We argue that modern renditions of ABCT, especially those based on Hayek ([1935] 2008), refrain from implementing a meaningful resource constraint due to their abandonment of the subsistence fund. Although it barely emerged from the status of a metaphor, the concept of the subsistence fund at least hinted at what could be the cause of the upper turning point of the business cycle. For these two reasons, its omission must be seen as a step in the wrong direction taken by Mises, Hayek, and most of their followers.

2. The rise of the subsistence fund

2.1 Time and the production process

One of the main postulates of classical economics was that it is necessary to look directly at the “realities” of the phenomena and not to be deceived by the observable “outward mechanism of paying and spending” (Mill 1965: 89). One notable area where the classical authors tried to adhere to this postulate was the wages fund. They argued that a fund of consumer goods – the wages fund – is the precondition of any but the most primitive production processes. The amount of consumer goods was given in the short run and served as a resource constraint on production (Hennings 1987).

To understand the background of this theory one must keep in mind that the classical

³ What Mises (1949: 427, 436, 469, 544, and *passim*) coined a “crack-up boom.”

British economists were writing in a time when agriculture was still the central and most visible line of production (Phillips 1967: 321 f.). By and large, the whole nation had to subsist for one year from the product of each crop. While the laborers were already working for next year's harvest, they had to be provided with the means of subsistence the last one had created. This is the simple and "self-evident" core of the wages fund theory (Senior 1854: 153).⁴

Building on Jevons's ([1871] 1911) brief comments on the wages fund, Böhm-Bawerk ([1889] 1930) addressed two shortcomings of the doctrine: the claim that the wages fund was needed to sustain production processes of a fixed duration (typically one year) and the disregard of the fact that the product of one period is not necessarily consumable output, but rather an input for use in another production process. In addressing these issues Böhm-Bawerk integrates his reformulation of the wages fund into a simple growth model.

On the one hand, production leads to greater results when more roundabout (i.e., time-consuming) methods encompassing additional intermediate stages of production are employed (Böhm-Bawerk [1889] 1930: 20 ff.). On the other hand, entrepreneurs can only implement more roundabout methods of production when the wages fund is sufficiently large (Böhm-Bawerk [1889] 1930: 400). In short, Böhm-Bawerk applied the classical view of the resource constraint on production to a more sophisticated model of the production process. The underlying idea remained the same: production is a time-consuming process that presupposes the existence of a fund that allows for the provision of the participating persons until the final product is finished. This final product must be in the form of a consumable good to replenish those exhausted during the production process to sustain workers.

⁴ The idea that this year's harvest is related to next year's harvest was already foreshadowed by Adam Smith's discussion of the "corn economy" (Smith 1776, book II, chap. III). Later developments focused on the relationships between the harvest of one year and subsequent levels of productivity and wages as factors that would affect future harvests (Hicks 1965: 36-42); Lachmann (1968: 130-42; Lewin 1999: 53-57).

One of Böhm-Bawerk's contributions was to dismiss the term "wages fund" for the more holistic "subsistence fund." He did so because a pre-existing fund of goods is not only necessary for the subsistence of laborers – which the term "*wages*" fund seems to indicate – but of capitalists and landowners as well (Böhm-Bawerk [1889] 1930: 70).

Böhm-Bawerk's rehabilitation of the wages fund doctrine was immediately appealing to neo-classical theorists. Further elaborations of the production process based on his two ideas – 1) more roundabout processes are more productive, yet 2) they are constrained by the available amount of consumer goods – can be found in Taussig (1896), Wicksell ([1898] 1936), Pantaleoni (1898), Mises ([1912] 1953), Strigl ([1934] 2000), Dorp (1937), and Eucken (1954). Later we will demonstrate how some of these authors built a business cycle theory upon this foundation.

2.2 Limits of the subsistence fund metaphor

Economists ultimately abandoned the subsistence fund theory by the 1940s. It was not thought possible to integrate it into the theories that came into vogue at the beginning of the 20th century, such as the marginal productivity theory of wages and output, or the Keynesian reformulation of Say's Law according to which demand creates its own supply (Braun 2014). The main problem was that the idea of an accumulated "fund" of consumer goods did not match the facts of post-Industrial Revolution economies.

Beyond an agrarian society it is difficult to specify in any meaningful sense what (and where) this subsistence fund is supposed to be and for how long it must suffice. In a modern society production is synchronized by way of several staggered production processes producing (Strigl [1934] 2000: 9 f.). Therefore, there is no longer any subsistence fund in the strict sense (Hayek 1941: 85 f., 146). In the economies of the 20th century it had become only a metaphor for

the real resource constraint intuited to be the limiting factor on production.

The solutions suggested to deal with the problem of identifying *what* resources constrain production were not entirely convincing, and they could not prevent the abandonment of the subsistence fund from economic theory. Böhm-Bawerk ([1889] 1930: 321 f.), for example, did not limit his subsistence fund to actual consumer goods like the classical economists had with their wages fund. Instead, his fund consisted of the entire wealth of the economic community. All goods which today constitute the wealth of an economy ripen into consumer goods at some future time and will then be available to cover the ensuing consumption demands. Not only the currently existing consumer goods, according to Böhm-Bawerk, but also the amount of consumer goods continuously coming into existence will determine the potential length of the production process that may be sustained through the subsistence fund. However, under this formulation the idea that the subsistence fund constrains the length of the production processes takes a much less restrictive form. To state that the whole wealth of a nation serves – both in stock form today and flow form in future periods – as a resource constraint on production might not be wrong, but it is a rather loosely binding constraint in any ongoing production process.

In order to translate the subsistence fund metaphor to the modern production process, Strigl ([1934] 2000: 26 ff.) takes a different approach than Böhm-Bawerk, effectively building off Jevons ([1871] 1911) to explain the “circulation of capital” in the production process. Jevons ([1871] 1911: 224 ff.) considered the idea of the subsistence fund as the core of *capital theory*, something Böhm-Bawerk ([1889] 1930: 42 f.) denied explicitly. The “ordinary sustenance” required to support laborers while engaged with their work is, for Jevons, “the true form of capital” ([1871] 1911: 243). In order to express this thought, he ([1871] 1911: 223 f.) introduced the term “free” or “uninvested” capital. By building factories, railways, and machines,

entrepreneurs *invest* free capital, that is, “food and maintenance.” The capital remains invested or sunk until it is available again in the form of free capital (Jevons [1871] 1911: 242 ff.).

The main point is that while free capital – the subsistence fund – is a necessary precondition of the beginning and the continuation of the production process, it constitutes also the final output of any process. Jevons’s “free capital” and Strigl’s reformulation of the subsistence fund make it possible to maintain the idea of a fund consisting only of consumer goods. However, as for Jevons and Strigl free capital is freshly produced every day, it cannot be argued that the currently available fund of consumer goods in any way limits the length of the production period. Similar to Böhm-Bawerk’s case, it is difficult to see how the resource constraint represented by the subsistence fund can become binding.

On its own, the subsistence fund might be a suitable metaphor for the way production has to be funded in real terms (especially in a primitive barter economy), but it cannot be applied to the modern financial economy without strong reservations. In his review of the business cycle controversies of the 1930s, Bernhard (1943) lamented that the “scarcity of capital” shifted from indicating a real resource constraint at some times to a volume of money at others. This signaled the tension economists had in translating the existing subsistence fund, formulated in terms of real as opposed to nominal assets, to something analogous and relevant to the increasingly financial economy. The intended meaning of the concept “scarcity of capital” was often “impossible to determine” (Bernhard 1943: 55). The subsistence fund had lost relevance as a resource constraint on production.

2.3 The subsistence fund metaphor in business cycle theory

In applications of the subsistence fund to business cycle theory, it is important to distinguish

between the metaphorical use of the term and the attempts to reformulate and integrate it into the theory. To our knowledge, no author has made such a distinction explicit. The present section concentrates on the metaphorical use of the subsistence fund.

The subsistence fund can be used without difficulties to illustrate the logic of an economic crisis in an agrarian society. The consequence of a crop failure can be described as insufficient means of subsistence to sustain previously undertaken investment projects. This idea was behind Jevons's (1884: 221 ff.) sunspot theory of the business cycle, where he argued that solar activity explains whether harvests are good or bad and that it thus determines the ebbs and flows of an agricultural economy.

Mises's ([1912] 1953) initial formulation of his business cycle theory, predicated on Böhm-Bawerk's subsistence fund, rests upon a similar foundation. For Mises, the bust is caused by a lack of the means of subsistence. However, he does not ascribe this lack exclusively to crop failures, but to unsustainable changes in the structure of production. Mises ([1912] 1953: 360) argues that in order to be sustainable the period of production "must be of such a length that exactly the whole available subsistence fund is necessary on the one hand and sufficient on the other for paying the wages of the labourers throughout the duration of the productive process." Mises, in other words, accepts Böhm-Bawerk's theory of the production process based on the classical theory of the wages fund. The subsistence fund serves as a resource constraint limiting the sustainable lengthening of the production period.⁵

Mises's boom-bust cycle occurs when entrepreneurs are fooled into thinking that the

⁵ Mises was not consistent in his use of the subsistence fund throughout his writings on the business cycle (Braun 2012). Early formulations put the onus of investment sustainability on the subsistence fund (Mises [1912] 1953). His last exhibition eschewed the subsistence fund almost completely as an explanation of the turning point of the business cycle and instead relied on skewed expectations and the difficulties of planning in an inflationary environment (Mises 1949).

subsistence fund has increased. Here it is important to point out what Mises thought would happen when investors' expectations of the fund become uncoupled from its physical embodiment. When entrepreneurs believe that the subsistence fund has increased, they consider it possible to partake in more roundabout – and therefore longer and more productive – processes of production. The average period of production will be lengthened which will require a sufficient subsistence fund to see them through to completion (Mises [1912] 1953: 361). Yet, in so far as the subsistence fund has not increased at all, the bust is unavoidable:

A time must necessarily come when the means of subsistence available for consumption are all used up although the capital goods employed in production have not yet been transformed into consumption goods. [...] The means of subsistence will prove insufficient to maintain the labourers during the whole period of the process of production that has been entered upon. (Mises [1912] 1953: 362)

Therefore, the production process must be adjusted. Some of the new investments must be left either entirely unused, or at least will be used less economically. Alternatively, consumers must curtail consumption to allow the subsistence fund to be stretched further than would otherwise be possible (as alluded to in Hayek [1935] 2008: 268, Bresciani-Turroni 1936, and Bagus and Howden 2010: 66-69). In short, there is a loss of value in the economy and a recession sets in (Mises [1912] 1953: 364).

3. Attempts to integrate the subsistence fund in the Austrian business cycle theory

3.1 The natural rate of interest

Mises ([1912] 1953) and Strigl ([1934] 2000) both build on the preparatory work of Wicksell ([1898] 1936) to try to go beyond mere metaphors and to explain what links the entrepreneur's investment decision to the size of the subsistence fund. They accept that entrepreneurs do not consider a factor called the "subsistence fund" when deciding the time dimension of their investment projects. In its place they are guided by the rate of interest. When the rate is low, more time-consuming investments become more profitable and vice versa.⁶ Both Mises's and Strigl's point is that the *natural* or *equilibrium* rate of interest, in accordance with marginal productivity theory, bears a close relationship to the subsistence fund: the greater the available means of subsistence the lower the rate of interest.

According to Wicksell ([1898] 1936: xxvii), cumulative price movements result when the money rate of interest deviates from the natural rate of interest. In the following, we concentrate on the case where the money rate happens to be below the natural rate because it is the one that is more important for business cycle theory. The *natural* rate of interest, in Wicksell's ([1898] 1936, p. xxvi) theory, corresponds to the rate of interest that would be brought about by a moneyless economy where goods are exchanged intertemporally and in kind. From the way Wicksell describes this theoretical state of affairs it becomes clear that he considered the natural rate to be determined by the supply of and the demand for the "wages and rent fund":

It may be supposed in theory that the entrepreneur borrows [...] *consumption goods* from the capitalists in kind, and then pays them out in kind in the shape of wages and rents. At the end of the period of production he repays the loan out of his own product, either

⁶ Adherents to ABCT during the 1930s were not unified in this belief. Machlup (1932: 279-80) reckoned that a reduction in the interest rate would not affect all projects homogeneously but rather it would entice entry into industries less reliant on fixed capital.

directly or after exchanging it for other *commodities* (relative prices being assumed to remain unaltered). If this procedure were adopted by all entrepreneurs who work with borrowed capital, competition would bring about a certain *rate of interest* that would have to be paid to the capitalists in the form of some commodity or other. (Wicksell [1898] 1936: 103, emphases changed)

This is the springboard from which Mises ([1912] 1953: 355 ff.) commences his exposition of the business cycle, adopting Wicksell's use of the natural rate of interest. Mises maintains that the natural rate is the "rate of interest which would be determined by supply and demand if real capital was itself lent directly without the intermediation of money" (Mises [1912] 1953: 118). Similar to Wicksell, he adds that "the national subsistence fund" is at least "one of the elements that help to determine the rate of interest" (Mises [1912] 1953: 347). (He does not specify what he considers to be the other elements – the subsistence fund is the only variable he mentions.) He repeats this point some lines below where he states that "[t]he greater the fund of means of subsistence in a community, the lower the rate of interest (*ibid.*)" To sum up, Mises argues that the natural rate of interest alludes to a real resource constraint, i.e., to the size of the subsistence fund. If the natural rate is low, the subsistence fund is large and therefore more roundabout ways of production can be undertaken (Mises [1912] 1953: 360 f.).

Wicksell ([1898] 1936: 168) admits (and Mises ([1912] 1953: 355) agrees with him), that the natural rate of interest is an unobservable and hypothetical rate. It is the rate of interest that *would* prevail in a moneyless equilibrium. As opposed to this, the *money* rate of interest, in both Wicksell's and Mises's terminology, is the actual rate determined on the credit market. It depends on the demand for and the supply of loans, where the banking system can increase the supply of

credit – and therefore lower the money rate of interest – limited only by the zero bound (Wicksell [1898] 1936: xxvi; Mises [1912] 1953: 357 ff.).

Mises's point is that when the banking system lowers the money rate of interest below the natural rate, entrepreneurs – who cannot directly observe the natural rate or the extent of the subsistence fund – are fooled into acting as if the resource constraint had slackened and adapt the structure of production in an unsustainable way. In reality the natural rate has not decreased nor has the subsistence fund increased, and thus the means of subsistence will not suffice to complete the investment plans; the boom-bust cycle results. As a consequence, Mises argues that the money rate will have to rise until it is equal to the natural rate, this way demonstrating to the entrepreneurs that their calculations have been erroneous.

The weak point of this argument is that it does not really abandon the metaphorical use of the subsistence fund. Neither Wicksell nor Mises provide any argument for their contention that the natural rate of interest indicates the size of the subsistence fund. Furthermore, Mises does not explain why the money rate of interest must revert to the natural rate when the prices of consumer goods increase. Accordingly, Hayek ([1935] 2008: 253 f., n. 54) notes that Mises ([1912] 1953) contains hardly more than one sentence on the actual working of the price mechanism during the boom-bust cycle. Mises did not elaborate on the linkage between entrepreneurial expectations, interest rates, and the subsistence fund.

3.2 The purchasing power of money and the subsistence fund

Strigl ([1934] 2000) recognized this problem in Mises's ([1912] 1953) business cycle theory and added another argument to demonstrate that the natural or equilibrium rate of interest indicates the available means of subsistence and thus defines the real resource constraint. According to

him, the natural rate of interest is not the interest rate that would prevail if capital was lent in kind, as Wicksell and Mises had maintained. In its place he redefined the natural rate as the *monetary* interest rate that would appear on a free market, i.e., on a market where the banking system does not create additional money and therefore all money loans stem from prior savings (Strigl [1934] 2000: 113 f.). He argued that in a world where the banking system cannot create money, the purchasing power of money bears a close relationship to the subsistence fund. If someone lends money to another, this is the same as lending the means of subsistence: “Money capital serves the purpose of delivering the means of subsistence actually available in an economy to those who need them as support for the duration of the roundabout method of production” (Strigl [1934] 2000: 98).⁷

By treating money this way, Strigl is able to add some substance to Mises’s ([1912] 1953) argument according to which the natural rate of interest depends on the size of the subsistence fund. If Strigl’s argument is valid and the purchasing power of money is determined by the consumer goods available for purchase, then the rate of interest on such a market would indeed signal information concerning the size of the subsistence fund. A low interest rate implies a large supply of money loans. Since the purchasing power of money derives from its ability to purchase consumer goods, a large supply of money loans also signals an abundance of means of subsistence.

Strigl ([1934] 2000: 116) follows Mises ([1912] 1953) in arguing that a lowering of the interest rate by means of a credit expansion of the banking system induces entrepreneurs to lengthen the period of production. In his point of view, the additional money on the loans market does not stem from savings and therefore does not represent an increased supply of consumer

⁷ This argument traces back to Wicksell ([1898] 1936: 16) who stressed that “the ideally correct procedure for observing and measuring the general price level is to confine the calculation to objects of (direct) consumption.”

goods. Banks consequently increase the supply of money credit relative to the supply of available means of subsistence (Strigl [1934] 2000: 126) and cause maladjustments in the production structure.

In arguing that money bears a close relationship to consumer goods, Strigl did not solve the problem, but rather shifted it to a different level. In order to support his thesis, he would have had to show that the purchasing power of money is derived from consumer goods. Marget (1938: 487) laments that proposals of this kind go far back in the history of economics, but they have never been accompanied by a convincing argument. This grievance holds also for Strigl's treatment of the problem. Although attempting to go beyond the mere metaphorical level, neither Mises ([1912] 1953) nor Strigl ([1934] 2000) – the two works stressing the subsistence fund most intensely – actually managed to do so. Strigl ([1934] 2000) proved to be the last systematic attempt to integrate the subsistence fund into the Austrian theory of the business cycle.

4. The fall of the subsistence fund

4.1 The abandonment of the subsistence fund in Austrian business cycle theory

After Strigl ([1934] 2000), the subsistence fund disappeared from Austrian business cycle theory, with both Hayek ([1935] 2008) and Mises (1949) explaining the boom-bust cycle in different terms. Hayek (1941, chap. 7) tried to rectify this omission in his final full-length foray into the capital debates, though with only mixed results. He (1941: 85) tried to reformulate the fund from a stock of the actual means of subsistence (i.e., consumer goods, as had been the case in its early formulations) to a stock of goods that can be *turned into* the means of subsistence (i.e., circulating capital). He ultimately doubted the relevance of this reformulation for two reasons. First, as the goods laying claim to consumer goods in any dynamic economy are constantly

changing, the concept lacks the fixity necessary to serve as a binding resource constraint. (Faber (1979) reckons it was this static emphasis in the formulation of the subsistence fund that brought it to an impasse during the 1940s.) Second, the amount of consumer goods that any one person has at his disposal depends on the choices of all other persons in society. The more other people exercise their command over consumer goods, the fewer remain for any one individual (Hayek 1941: 266 f.) Furthermore, in his quest to refine his own capital theory, Hayek shifted the attention of his own subsistence fund to not only the present stock and augmenting flow of consumer goods, but also the circulating capital that is contributing to this flow (Hayek 1941: 146).⁸ After a brief discussion of how the actual subsistence fund “cannot be identified in any definite and unambiguous way” (1941: 190), Hayek scuttled the concept from his own elaboration of the business cycle. This proved to be the last attempt to define the fund and frame its importance to the investment process.

In place of the subsistence fund, Hayek ([1935] 2008) offers a different explanation of the turning point of the business cycle. He ([1935] 2008: 237) argues that the length of the production process depends on the relationship between expenditures on producer goods and expenditures on consumer goods. When people increase their spending on producer goods, more capitalistic, i.e., more roundabout, methods of production will result. In the example he uses to illustrate his point, there are 120 units of money in the economy each of which is spent once a year. Therefore, total expenditures per year amount to 120. In the original state of affairs in his example, expenditures on consumer goods come to 40, expenditures on producer goods to 80. If, starting from there, people should save another 10 money units, now 30 would be spent on

⁸ This shift marked a reversal for Hayek, who five years earlier defined the subsistence fund exclusively in terms of capital goods saved up to complete undertaken production processes (Hayek 1935b). This shift was itself a reversal from Hayek ([1935a] 2008, 1934) where the subsistence fund was defined in the much more conventional (at least for the time) way as a sum of consumer goods.

consumer goods and 90 on producer goods (Hayek [1935] 2008: 237 f.). As a consequence of this shift of expenditures, “the average length of the roundabout processes of production and, therefore, [...] also the number of successive stages of production, is increased in the same proportion as the demand for intermediate [i.e., producer] goods has increased relatively to the demand for consumers’ goods” (Hayek [1935] 2008: 238).

It is important to note that Hayek, in contrast to Strigl and Mises, does not introduce a real *resource* constraint in order to explain the potential length of the production period. He starts with a given amount of *expenditures* on goods of any kind. The length of the production process is determined by the proportion of expenditures on producer goods relative to consumer goods.

When it comes to explaining the business cycle based on his vision of the production process, Hayek ([1935] 2008: 266), like his predecessors, starts with a reduction of the rate of interest below the natural or equilibrium rate by the injection of additional money. In his ([1935] 2008: 241 ff.) example, entrepreneurs receive an additional 40 units of money, which they spend on producer goods. Thus they change the proportion between expenditures on producer and consumer goods from 80:40 to 120:40 which results in a longer production process. However, for Hayek this change in relative expenditures cannot be maintained, and brings an unsustainable boom to bust. He gives two reasons as to why this should be the case. The first one is reminiscent of the subsistence fund metaphor employed by Mises and Strigl, whereby he ([1935] 2008: 267) argues that the lengthening of the production structure induced by the lowering of the interest rate is not accompanied by a reduction in consumption expenditures. Therefore, as soon as the additional investments on lengthier production processes causes a temporary reduction in the production of consumer goods, their prices will rise. For some time, “society as a whole will have to put up with an involuntary reduction of consumption” (Hayek [1935] 2008: 268). This

argument, so far as it goes, does not explain why a general economic contraction should occur, but rather that prior consumer plans will be disrupted in specific markets. Only when people would react in a way that increases the relative amount of expenditures on consumer goods could it be said that the new and longer production structure is unsustainable. Yet, this cannot happen because, as Hayek ([1935] 2008: 243) admits, expenditures on consumption can only be increased “if [consumers’] money receipts should rise.”

In Hayek’s second argument as to why the new expenditure ratio cannot be sustained he asserts that the income of the original owners of the factors of production will rise as a consequence of the increased amount of money available for investment (Hayek [1935] 2008: 268). According to him, there can be little doubt “that in the face of rising prices of consumers’ goods these increases [in income] will be spent on such goods” (Hayek [1935] 2008: 268). Consequently, as more is now spent on consumer goods, the proportion between the amount spent on producer goods and that spent on consumer goods will change in favor of the latter. This must mean a return to less roundabout methods of production and the onset of an economic crisis as the adjustment takes place.

Hayek’s second argument provides no better a solution than the first. He does not give any reason why the income of the owners of the original factors of production should rise in the case where 120 money units are spent on producer goods and 40 units on consumer goods – the case where the expansion is induced by additional money – whereas the income of these owners does not rise when the proportion in question is 90 to 30 – the case where the expansion is induced by additional savings. After all, in *both* cases the entrepreneurs have more money available for investment, and therefore, if one follows Hayek’s argument, in both cases the income of the factor owners should rise.

Hayek's concentration on nominal expenditures as opposed to real magnitudes like the subsistence fund prevented him from building his theory on even a vaguely defined or metaphorical resource constraint, as Mises and Strigl did. Changes to expenditures on goods and resultant incomes, however, cannot supplant the real resource constraint limiting the period of production like the subsistence fund can.

4.2 The void left by the subsistence fund

It seems that Hayek's ([1935] 2008) refusal to use the subsistence fund metaphor had a significant impact on later expositions of the Austrian business cycle.⁹ Mises (1949), however, does not take over Hayek's focus on the proportion between expenditures on consumer goods and expenditures on producer goods.¹⁰ Nonetheless, Mises (1949) abandons the subsistence fund as an explanation of the resource constraint that limits the length of the production period (Braun 2012: 201 ff.). Instead, he argues that it is the availability of *capital goods* that serves as a resource constraint and that becomes scarce at the turning-point of the crisis. Yet Mises does not realize that capital goods cannot serve as a resource constraint (Braun 2012: 205). They are, per Mises's (1949: 263) own definition, *produced* factors of production. If they should happen to become scarce, their prices would rise and their production would be stimulated. There is no reason why this could induce a downturn for if it did the production of additional capital goods would easily moderate it.

⁹ Rothbard (2004) and Huerta de Soto (2012) all build upon Hayek's argument and do not integrate the subsistence fund as Mises ([1912] 1953) and Strigl ([1934] 2000) had done. In one of the more influential recent expositions of Austrian business cycle theory Garrison (2001: 58) mentions the subsistence fund but once, and only as a passing allusion to the general availability of investable resources, not in terms of a potentially binding resource constraint.

¹⁰ Although commonly treated as synonymous, Hayek's and Mises's treatments of the business cycle differed in several ways. While herein we demonstrate Hayek's reluctance to make use of the subsistence fund to the extent that the early Mises did, Garrison (2004) looks to their differing conceptions of forced savings, as well as Mises's attention to the role of overconsumption in defining the boom's unsustainability, an aspect which is not unrelated to his earlier work on the subsistence fund.

This point can be illustrated by means of Mises's (1949: 557) example of the "master-builder whose task it is to erect a building out of a limited supply of building materials." In the boom phase, Mises argues, the whole entrepreneurial class acts like a master-builder who overestimates the quantity of bricks at his disposal and commences building the foundation on a larger scale than will be possible to complete. After planning for and completing the early stages of production, he realizes that he lacks the material needed for the completion of the building.

Although Mises uses this example to illustrate the resource constraint on production, it does not adequately capture the difficulty that entrepreneurs encounter when estimating the future availability of resources needed to complete investments. The entrepreneurial class will rarely be confronted with a capital good (e.g., bricks) whose supply is limited in the absolute sense (i.e., is not reproducible) and which furthermore does not allow for substitution. In Mises's example, as bricks became scarce their price would rise. This would harm some entrepreneurs (those who use bricks as an input) but it would benefit others (those who produce bricks or brick substitutes). The change in relative prices might explain local crises in certain industries, but not a general economic crisis. Furthermore, the increased price of bricks would signal the shortage to producers, who would alleviate the shortage by increasing the quantity supplied, thus relaxing the resource constraint. When the prices of capital goods increase, those entrepreneurs on the supply side benefit and those on the demand side lose. No systematic error would beset all entrepreneurs simultaneously (one man's crisis is another's opportunity).

This is different in the case that the subsistence fund is depleted. Inherent in the subsistence fund theory is the idea that *all* kinds of production processes, from the highest to the lowest stages of production, depend on the availability of consumer goods that will sustain workers. One invokes a type of circular reasoning to maintain that those producing consumers'

goods can be sustained by the goods they produce themselves. What is necessary to alleviate the scarcity of consumer goods is the conjoined production of all stages in production, keeping in mind that the means of subsistence must be sufficiently available for workers at all stages. The specific nature of this bottleneck caused by a depletion of the subsistence fund was already pointed at by John Stuart Mill (1965: 78) in his famous fourth fundamental proposition on capital. The “maintenance or payment of labour” he stated, does not depend on the demand for consumer goods, but “on the amount of the capital, or other funds directly devoted to the sustenance and remuneration of labour.” In other words, an increase of the subsistence fund cannot be induced by increased prices due to increased demand; what is needed is increased savings or decreased consumption. Without this, *all* entrepreneurs will face increased costs as the means to sustain workers are scarce and this necessitates that the whole of the structure of production be restructured so as to either, 1) make do with fewer savings, or 2) produce less output.

Modern renditions of the Austrian business cycle (Garrison 2001; Huerta de Soto 2012) do not substantiate further the claim that investors proxy the size and extent of the subsistence fund. This omission makes modern Austrian business cycle theory a strange bed fellow with modern finance theory whereby the interest rate only serves as a hurdle or benchmark against which investors gauge the attractiveness of an investment, not as an indicator of how able the market is to complete the project. In both theories, there is no link between the financial sector to the real sector, and no reference to any type of real resource constraint. Even Sechrest (2006), who views the subsistence fund as essential to the core Austrian business cycle theory, does not provide a suitable link. He (2006: 32) defines the subsistence fund in terms of money and thus skips the main point of the subsistence fund metaphor in a manner similar to Hayek’s ([1935]

2008) focus on nominal expenditures. Whether the subsistence fund concept is apt to provide the necessary link is an open question. But what has been put in its place, especially in business cycle theory, but also in finance theory, ignores much of the problem that the classical and some early Austrian economists tried to tackle by means of this metaphor: what is it, in real terms, that limits the amount of investment?

5. Conclusion

Böhm Bawerk reformulated the classical doctrine of the wages fund to a more encompassing concept fit for the post-Industrial (and non-agrarian) world. In particular he took issue with the idea that the subsistence of capitalists and landlords was also necessary to complete any production plan, not just the narrow maintenance of the laborers. It was on this basis that Böhm Bawerk eschewed the term “wages fund” for the more general subsistence fund. By integrating this fund into a simple growth model, Böhm Bawerk’s contribution to the concept was in showing that, 1) not all production is consumable output to replenish the subsistence fund; some production represents producer goods that will reintegrate into the economy’s capital structure, and 2) since production is a continuous process any reckoning of a subsistence fund would need to be on a flow basis, instead of as a stock of consumer goods. Unfortunately, Böhm Bawerk’s followers – notably Mises, Hayek, and Strigl – were unable to refine further the subsistence fund doctrine to meet the demands of the post-Industrial world, where physical goods were supplanted by money as the chief form of capital.

We have demonstrated two points in this paper. First, the subsistence fund as has been formulated in post-agrarian economies is only a metaphor. Neither the classical economists nor Mises ([1912] 1953) or Strigl ([1934] 2000) managed to develop the concept past this

metaphorical character. Renditions of Austrian business cycle theory – the last major theory to employ the concept – that rest upon this metaphor cannot be upheld without reservations.

Specifically, it is not possible to argue that the size of the subsistence fund is indicated by the natural rate of interest, as Mises ([1912] 1953) did, nor was Strigl ([1934] 2000) successful in arguing that the availability of money credit bears a close relationship to the available fund of consumer goods. The failure of later economic theorists to reformulate the subsistence fund as anything more than a metaphor led to its eventual disuse and ultimate purging even from the various forms of Austrian business cycle theory.

Second, Hayek's ([1935] 2008) attempt to formulate the Austrian business cycle theory without taking recourse to the metaphor is not convincing. The turning-point of the boom-bust cycle cannot be explained as a mere consequence of shifts in nominal expenditures. There must be a real resource constraint that sooner or later forces entrepreneurs to abandon their new investment projects. Mises's (1949) effort to substitute the subsistence fund with the availability of capital goods also cannot be upheld, since if that were the resource constraint causing an economic collapse the problem could be alleviated through the production of more capital goods.

In light of the discussion in this paper, however, what is needed is not to shed the concept completely but to revisit it. Business cycle theories, and especially those that fall under the umbrella of Austrian business cycle theories, are unable to explain the shift from boom to bust endogenously without a binding resource constraint. In this respect, while Mises's ([1912] 1953) and Strigl's ([1934] 2000) expositions of the subsistence fund were flawed in their own right, they were, at least, attempts in the right direction.

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