UvA-DARE (Digital Academic Repository)

The inner mechanism of the accumulation of capital: the acceleration triple - A methodological appraisal of Part Seven of Marx's Capital I

Reuten, G.

DOI

[10.1057/9781403938640_10](https://doi.org/10.1057/9781403938640_10)

Publication date

2004

Document Version

Author accepted manuscript

Published in

The Constitution of Capital

[Link to publication](#)

Citation for published version (APA):

Reuten, G. (2004). The inner mechanism of the accumulation of capital: the acceleration triple - A methodological appraisal of Part Seven of *Marx's Capital I*. In R. Bellofiore, & N. Taylor (Eds.), *The Constitution of Capital: Essays on Volume I of Marx's Capital* (pp. 274-298). Palgrave Macmillan. https://doi.org/10.1057/9781403938640_10

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (<https://dare.uva.nl>)

The inner mechanism of the accumulation of capital: the acceleration triple
A methodological appraisal of 'Part Seven' of Marx's *Capital I*

Geert Reuten

Published in Riccardo Bellofiore & Nicola Taylor (eds), *The Constitution of Capital; Essays on Volume I of Marx's 'Capital'*, London/NewYork, Palgrave–Macmillan, 2004, pp 274-298

Abstract

It is argued that for an appraisal of Marx's 'general law of capitalist accumulation' in Volume I of *Capital*, it is crucial to take account of its level of abstraction. Here Marx considers accumulation 'merely as moment of the immediate process of production' and so restricts to what he calls 'the inner mechanism' of capital accumulation ('inner' determinations are *not* more important than 'outer' determinations; the former have no existence without the latter; and the outer determinations may modify the actualization of the inner). Marx's warnings about this got de-emphasized in the English translations of the work. The terrain of 'the general law' is the impact of capital accumulation on the working class. Its core is an acceleration triple of growing capital accumulation, increasing productive forces of labour and an increasing technical composition of capital – presented in three phases of complication. In unfolding the dynamic interaction of this triple, Marx introduces the cyclical development of accumulation, though merely as an empirical reference. It is shown that, in this Volume, Marx does not – and methodologically could not – develop a theory of the cycle, and a fortiori no labour-shortage theory of the cycle. 'Centralisation' of capital is equally introduced by way of empirical reference.

Introduction

In this paper I discuss Marx's theory of the accumulation of capital in Part Seven of Volume I of *Capital*, especially in reference to its methodological status. The accumulation of capital – or the conversion of surplus-value into capital – is one of the two aspects of 'The production process of capital' (the subtitle of the book), the other aspect being the production of surplus-value, treated in the middle part of the book.

Starting from simplified notions of accumulation, Marx gradually explicates the complex dynamics of an interconnected triple accelerator of: increasing accumulation of capital, increasing productive forces of labour, and an increasing composition of capital. All along, however, his focus is methodologically restricted to the 'inner mechanism' of capital accumulation (as explained in section 1 below); I will indicate that this is important for understanding what Marx can (or is able to) achieve here.

We will see – in section 3 – that Marx introduces an idea of cyclical accumulation of capital. The character of this cyclical accumulation has been an issue of debate within the Marxian tradition and amongst historians of thought. It is shown that Marx does not introduce a 'labour-shortage' theory of the cycle. In fact he does not present a theory of the cycle at all: in *Capital I* cyclical accumulation is intro-

duced by way of an empirical reference. (I do not argue that the later Marxian theory of cyclical labour-shortage makes no sense; I argue that Marx does not introduce it in this book – the same applies for a theory of cyclical under-consumption; in fact, he never introduces these theories in either of the volumes of *Capital*.)

In this paper my concern is the methodological status of the final text of the book and not its genesis. Where required I compare the *Capital I* text with the text of *Das Kapital I*.¹ For reasons of space I abstain from specific comments on interpretations in the secondary literature.

1. Part Seven within the systematic of *Capital* Volume I

1.1. Part Seven in the German and English editions

The most general theoretical conclusions that Marx draws in *Capital I* on the process of accumulation of capital can be found in Chapter 24, Section 4 (the factors determining the extent of accumulation of capital) and the first four sections of Chapter 25 (The general law of capitalist accumulation). These will be discussed in sections 2–3 below. The corresponding chapters in the German edition are 22 and 23 – the difference is due to a reordering by Friedrich Engels for the English edition (1886) of the book. With some reluctance I follow this English convention for my chapter references – with apologies to those who read *Das Kapital* or its other language translations.

Engels also broke up the German Part Seven into two parts: Part Seven encompassing the systematic chapters (German chapters 21-23) and Part Eight the historical chapters (German chapters 24-25). When I refer to ‘Part Seven’ I mean the three systematic chapters – with the same apologies.

1.2. A cursory survey of Part Seven

‘Earlier we considered how surplus-value arises from capital; now we have to see how capital arises from surplus-value. The employment of surplus-value as capital, or its reconversion into capital, is called accumulation of capital’ (725).² In Part Seven of *Capital I*, from which this quote is taken, Marx first sets out the elementary shape of accumulation: extension or growth of capital. Next he shows how this growth accelerates in combination with the development of the productive forces of labour (section 2 below). And finally he introduces another accelerator: the technical composition of capital (section 3 below). All along his focus is on the dynamic consequences of this triple interaction on the capital–labour relation, and particularly on their propagation of a reserve army of unemployed labour which is a necessary condition for continuous accumulation of capital.

¹ I have great respect for the translators. Translators have to rely on contemporary text interpretations. When interpretations shift, earlier translations will inevitably become defective. Here lies a fundamental difference between an original text and a translation (of course a translation itself may be reinterpreted).

² All unspecified numbers, like this one, are page references to the English edition of *Capital I* in the Fowkes translation (Marx, 1867F). Where the context requires it I specify with a prefix "F", e.g. F, 725. Page references to the German edition of the work are always prefixed by a "G", e.g. G, 668 (Marx, 1867G).

1.3. *The assumptions delineating the level of abstraction*

Since around 1990, Marx scholars have increasingly come to appraise Marx's *Capital* as a systematic-dialectical work (to be distinguished from historical dialects – both of these different types of dialectics find their modern roots in Hegel).³ Relevant for this chapter is not so much the dialectic (I will not stress that) but the systematic, which is a systematic of, in principle, rigorous levels of abstraction running both in terms of the terrain analyzed and synthesised (see below) and in terms of the movement from simple determinations to complex ones (both within and across these terrains).

In considering the meaning of Marx's statements about the effects of the accumulation of capital – including cyclical aspects – it is of preeminent importance to list the assumptions on which these statements are based, assumptions that delineate Marx's level of abstraction. Here I list the assumptions relevant for these chapters.⁴

1. Earlier (Part Four) Marx explicitly considers an average capital (thus abstracting from intra- and inter-branch differences, including differing production periods and compositions of capital – dealt with in Volume III, Parts One and Two). In Part Seven, however, he deals with average *changes* in the composition of capital. Although much of Part Seven can still be read in terms of the average capital the analysis *leans*, and sometimes explicitly, towards a macroeconomic treatment.⁵
2. In the introduction to Part Seven Marx indicates that he assumes capital to pass 'through its process of circulation in the normal way'.⁶ The 'normal way' implies that commodities produced are sold 'at their value' (709-10). (This again implies that production and sales are carried out at the normal profit, or the normal surplus-value.) 'Normal' also implies, as Marx states, abstraction from any supply/demand discrepancies of the commodities produced. (He will explicitly introduce changes in the reserve of labour though, without considering their effect on the demand for commodities.)

³ See Reuten (2003a) for a brief history of the methodological appraisal of *Capital*, as well as for references to the literature. A problem in this appraisal is, first, that Marx experimented with the method so as to find his own way with it – but was hardly explicit about this; second, that he did not complete *Capital* (even less its planned continuations). Another problem is the status of "Part Eight" of *Capital I*, which does not fit the systematic (see Tony Smith 1990: 133-5 for a scholarly account; see Murray 2000-2002 for qualifications of the appraisal).

⁴ Others are listed in my Chapter 5 (footnote 3) in the present collection. In comparison to those, Marx now considers average changes in the composition of capital. He also states explicitly: that some share of surplus-value is accumulated (or consumed); that, generally and on average, there is some reserve army of labour; that wages are variable (within limits).

⁵ Though it is not macroeconomic – see my Chapter 5 footnote 3, and Bellofiore's Chapter 7, section 5, both in this collection.

⁶ He refers to Volume II for its analysis. Discrepancies especially are dealt with in Part Three of that volume.

3. Marx also abstracts from differentiations of capital into industrial capital, commercial capital, finance and banking and from landed property. Hence the ‘various mutually independent forms’ into which surplus-value is fragmented, ‘such as profit, interest ... rent’ are abstracted from. (709-10).⁷

Immediately following this, Marx makes a formal methodological statement:

Hence we initiate the accumulation abstractly, that is, merely as moment of the immediate process of production. (translation of Marx 1867G: 590)⁸

Both of the English translations miss the term ‘moment’ and (therefore) its reference to the subject matter of Volume I; that is, *its* level of abstraction.⁹ A ‘moment’ is a systematic-dialectical notion, referring to a type of analysis. First, it is the analysis of a constituent (in this case accumulation) that is not yet fully constituted (indeed, in the abstract perspective posited by, and extending through Volume I, we cannot yet grasp accumulation concretely). Second, a moment can have no isolated existence (it obviously cannot be isolated from everything presented so far in Volume I but, more importantly in the current context, it also has no existence in isolation from the presentation still to come in the following Volumes). Indeed it is the analysis of something abstract.¹⁰

Next, Marx makes a second methodological remark, this time relating to the content of his particular abstractions. He says that we can nevertheless consider accumulation merely as moment of the current level of abstraction; in other words, it is adequate to do this provisionally (*vorläufig*), since dropping the assumptions 2 and 3 would hinder a pure (*reine*) analysis of accumulation:

A pure analysis of the process, therefore, demands that we should, provisionally, disregard all phenomena that conceal the workings of its inner mechanism.
(F, 710 amended; G, 590)

Fowkes has ‘exact’ instead of ‘pure’ for *reine*; and he has ‘for a time’ instead of ‘provisionally’ for *vorläufig* (and Moore has the same). The ‘inner’ here refers, in my view, to the ‘immediate process of production’, that is, the capital–labour relation in general. In reference back to the first methodological remark, this does *not* mean that the ‘inner mechanism’ can have an isolated existence, *nor* that ‘the inner working’ would be unaffected (qualitatively or quantitatively) by the successive introduction into the presentation of additional phenomena (cf. the inner–outer pair in Hegel's *Logic*).¹¹

⁷ For the analysis of ‘these modified forms of surplus-value’ he refers to Volume III.

⁸ ‘Wir betrachten also zunächst die Akkumulation abstrakt, d.h. als bloßes Moment des unmittelbaren Produktionsprozesses.’ As emphasized in ‘*The Results*’ (published in 1933 – Appendix in Marx 1867F) the ‘immediate’ refers to the *Capital I* level of abstraction.

⁹ Cf. Marx 1867MA: 530 and 1867F: 710.

¹⁰ On the notion of ‘moment’ see also Reuten & Williams, 1989: 22.

¹¹ To stay close to the metaphor, we could analyze the inner working of the heart and the blood circulation; but each of these ‘inner’ parts of the body stands in a physical and social relation to its external surroundings; the body's interaction affects the actual blood circulation and we may, for

In other (non-dialectical) words, Marx's assumptions here are not negligibility assumptions, but heuristic assumptions.

2. Transformation of surplus-value into capital

2.1. *The drive for and the force for accumulation*

Accumulation of capital is the reconversion of surplus-value into capital. Its degree thus depends, *ceteris paribus*, on the part of surplus-value accumulated as capital. On the one hand this is the capitalist's 'act of will and 'drive towards self-enrichment' (738). On the other hand, Marx indicates (739), with

the development of capitalist production ... competition subordinates every individual capitalist to the immanent laws of capitalist production, as external and coercive laws. It compels him to keep extending his capital, so as to preserve it, and he can only extend it by means of progressive accumulation.

Nevertheless, 'with the growth of accumulation and wealth, the capitalist ceases to be merely the incarnation of capital'; 'there develops in the breast of the capitalist a Faustian conflict between the passion for accumulation and the desire for enjoyment' (740-1).

2.2. *The dynamics of accumulation introduced: productive forces and accelerated accumulation*

In this and the following section I summarize a number of Marx's statements in a formal way. At the same time I try to stay as close as possible to Marx's text; of course, any reading and summarizing is necessarily interpretative. Although I use a mathematical form (equations), what I do is not mathematics but rather the adoption of a shorthand notation for purposes of precision and logical consistency checking.

I keep the equations as simple as possible, that is in so far as Marx's text allows. Marx is not always explicit about whether the relations he posits are linear or non-linear. Whenever that is unclear I just phrase the relation as a function ($A = f(B)$). Determination should be read from right to left; if no determination is posited I use a $\equiv$ sign. An unspecified change in a variable is indicated by the prefix Δ . Thus $\Delta A = A_t - A_{t-1}$. Rates of growth are indicated by a circumflex. Thus $\hat{A} = \Delta A / A_{t-1}$.

In this chapter all capitalised symbols refer to values in monetary terms (thus calculated in a monetary dimension, e.g. £). All time indices have been suppressed; thus, for A read A_t (unless otherwise indicated). Time refers to a calendar period (t), for example a year.

Marx introduces the dynamics of accumulation of capital in the fourth section of Chapter 24. Without always being very explicit about this, he now introduces fixed capital (i.e. capital that is only in part 'consumed' within the production period). I

example, loose blood. Thus the body and its surroundings affect the blood circulation qualitatively and quantitatively. What is more, the heart and the blood circulation have no meaningful existence without the 'outer' body. That is to say, concretely commodities are not produced 'at their value' (etcetera) and this fact affects 'their' production and the accumulation of capital. (This is also a contribution to the discussion between Bellofiore and Moseley at the end of chapter 7.)

use the symbol K for capital. In order to keep transparent the connection with Marx's concepts and symbols as used in the middle part of *Capital I* (see my Chapter 5), I adopt as simplification the total constant capital (K_c) to be a multitude (μ) of the circulating constant capital C .¹² Note that μ may be taken as a temporary constant, but it is in fact variable and part of Marx's dynamics.

$$K \equiv \mu C + V \quad [\mu > 1] \quad \text{[definition] (1)}$$

Marx starts (747) by taking the accumulation of capital (ΔK) to be a given fraction ($\dot{a}$) out of surplus-value (S):

$$\Delta K = \dot{a} S \quad [0 < \dot{a} \leq 1] \quad \text{[determination] (2)}$$

The magnitude of surplus-value depends on the rate of surplus-value (e) and on the magnitude of the initial capital:¹³

$$S = f(e; K) \quad [f > 0]^{14} \quad \text{[determination] (3)}$$

Or also:

$$\dot{S} = f(\Delta e) \quad [f > 0] \quad \text{[determination] (3')}$$

(Marx is not explicit about time – the focus of Volume II. Nevertheless it should be noticed that if we consider a production period, S is an ‘end of period’ result, K a ‘begin of period’ stock and e a *process variable*, conditioned by the value of labour power *and the labour process*. Having analyzed the latter we may, for the sake of heuristic simplicity, take e each time again as a given. Being a process variable, there is nevertheless also a result for e (in the magnitude of surplus-value S). A difficulty in Marx's text is that he sometimes switches between these two notions of e without notification.)¹⁵

Next, in refocusing his conclusions from Parts Three to Five towards the accumulation of capital, Marx considers the effect of changes in the productive forces of labour (pfl)¹⁶ that press down commodity prices:¹⁷

¹² $K \equiv K_c + K_v$. More precisely we should have $K \equiv (\mu C_f + \tau C_c) + vV$, where: C_f is the component of instruments of labour; C_c the component of circulating constant capital; and τ and v turn-over coefficients (Marx introduces turn-over time only in *Capital II*, Part Two).

¹³ In the middle part of *Capital* the rate of surplus-value (e) has been explained by e^* , the rate of surplus labour to necessary labour (see my Chapter 5). On pages 751-2 Marx sets out why $\Delta K = f(K)$ is false (or perhaps we should say a false start – see the next section).

¹⁴ $f > 0$ means that there is a positive relation between S and each of e and K .

¹⁵ The reconstruction in my Chapter 5 tried to take account of this. In terms of that chapter, we each time take *beta* as given.

¹⁶ The *effect* of rising ‘productive forces’ is a *potential* rise in productivity of labour (see also my Chapter 5). If Marx had lived 100 years later he would perhaps have cast this in terms of techniques of production. Note that in this Section he abstracts from the value composition of capital (or perhaps, he considers such changes in ‘technique’ that leave unaffected the *value* of means of production).

$$\Delta \Pi = f(\Delta pfl) \quad [f < 0] \quad [\text{determination}] \quad (4a)$$

Increasing productive forces have a twofold effect on accumulation. First, because the physical surplus product increases, capitalists ‘may’ buy the same consumption basket with a smaller ‘consumption-fund’, hence the ‘accumulation-fund’ may increase. Thus the fraction $\dot{a}$ in equation (2) is turned into a variable depending on the development of the productive forces (‘may’ depending on the ‘drive’ and force for accumulation, which I abbreviate as dfa):¹⁸

$$\dot{a} = f_1(dfa) + f_2(\Delta \Pi) \quad [f_1 > 0; f_2 < 0] \quad [\text{determination}] \quad (5)$$

Thus:

$$\dot{a} = f(dfa; \Delta pfl) \quad [f > 0] \quad [\text{reduced form of 4-5}] \quad (A)$$

The second effect is on the rate of exploitation. Let us first simply translate the value of labour-power per day (VLP) into the wage rate per hour (W) given some length of the working day (h).

$$W \equiv VLP / h \quad [\text{definition}] \quad (6)$$

Thus to the extent that the working day is a constant, we can use the wage rate and the VLP interchangeably.¹⁹ Marx posits:

$$\Delta e = f(\Delta W) \quad [f < 0] \quad [\text{determination}] \quad (7)$$

Of course we know that this determination is defective and represents *merely one factor* (Marx ‘freezes’ changes in the labour process, including the intensity of labour). The value of labour-power (and the wage rate) is made up of a given ‘real’ component (some basket of commodities w) and a price component.

$$W \equiv w\Pi \quad [\text{definition}] \quad (8)$$

Thus:

$$\Delta W = f(\Delta pfl) \quad [f < 0] \quad [\text{reduced form of 4 \& 8}] \quad (B)$$

¹⁷ I take Π to be some composite indicator for prices (at the level of *Capital I*, i.e. on the basis of its assumptions, and particularly in abstraction from strictly monetary determinations of the price level). Today it might perhaps be interpreted as a particular price index.

Equations with a number plus letter, e.g. (4a), will be amended in the course of the argument – into e.g. (4b). Capitalised equation indicators – e.g. (A) – are derived from other ones.

¹⁸ Pages 752-3. Note again the assumptions. It is only in *Capital II*, Part Three, that Marx considers the problems of sectoral adaptation of such switches from consumption to accumulation. In fact Marx’s labour theory of value allows him to stylize all kinds of complications into a tractable shape.

¹⁹ I expanded on this in section 2.5 of Chapter 5 above.

Therefore the change in productive forces similarly affects the value of labour-power (or W) – the production of relative surplus-value, treated in Parts Four and Five. Hence the nominal wage is pressed down, and the rate of surplus-value up. All this *ceteris paribus*, we should add (see the next sections).

Taking (1)–(8) together we see how, *ceteris paribus*, the accumulation of capital (ΔK) depends on, first, K and the initial C/V division (eqn 1) – to which we will return in section 3 – and second on the development of the productive forces (Δpfl). Or, more precise, starting from an initial rate of growth of accumulation (K), a change in that rate depends on changes in the productive forces:²⁰

$$\Delta K = f(\Delta pfl) \quad [f > 0] \quad [\text{reduced form of 2–8}] \quad (C)$$

Marx calls this ‘accelerated accumulation’ (e.g. 753; this terminology became fashionable in mainstream economics around 1935). Therefore:

science and technology are formative [*bilden*] to a potential expansion of capital, independent of the prevailing magnitude of the functioning capital.
(F, 754; translation amended, cf. G, 632)²¹

In the next pages Marx clarifies that changes in the productive forces also impact on the replacement investment (and that it has depreciative effects); thus the change in *pfl* spreads gradually over the existing capital (753-4).

3. ‘The general law of capitalist accumulation’

3.1. Interdependency of wage rate and rate of exploitation – ‘the law of capitalist production’

I now turn to Chapter 25 of *Capital I*, ‘The General Law of Capitalist Accumulation’: the investigation of ‘the influence of the growth of capital on the fate of the working class’. Its ‘most important factor’, Marx writes, ‘is the composition of capital, and the changes it undergoes in the course of the process of accumulation’ (762). Since Marx, for the purposes of his first section, takes the ‘composition of capital’ as constant, I just present two definitions and postpone their discussion until later (section 3.2). The ‘value composition of capital’ (*vcc*) is the ratio of constant capital (C) to variable capital (V).

$$vcc \equiv C / V \quad [\text{definition}] \quad (9)$$

²⁰ For the productive forces I have used, in Chapter 5, the shorthand « C/L », or « K/L » if we include fixed capital. Although I believe that representation to be close to Marx, also for the current Part (e.g. ‘the value and mass of the means of production set in motion by a given quantity of labour increase as the labour becomes more productive’ – 754; cf. 759), I refrain from adopting it here.

²¹ The translation misses both the ‘formative’ (*bilden*, rendered as ‘give’) and the ‘potential’ (*Potenz*). Of course they have to be *applied* for valorization. (See also the chapters of Smith and Murray in this volume.)

(In terms of equation (1): $vcc = \{(K/V) - 1\}\{1/\mu\}$.)

The ‘organic composition of capital’ (occ) is the ratio of the value of the means of production (C) to the labour working up those means of production (l) – the latter measured in hours.

$$occ_l \equiv C / l \quad \text{[definition] (10)}$$

(In terms of equation (1): $occ_l = \{(K - V)/l\}\{1/\mu\}$.)

When the term ‘composition of capital’ is used without further specification, Marx writes (762), the organic composition is meant. As indicated, in this section he sets these constant – the same applies for the productive forces.

$$vcc = 0 \quad \text{[heuristic assumption] (11a)}$$

$$occ = 0 \quad \text{[heuristic assumption] (12a)}$$

$$\Delta \Pi = f(\Delta pfl) = 0 \quad \text{[heuristic assumption] (4b)}$$

Marx notices (763):

If we assume that, while all other circumstances remain the same, the composition of capital also remains constant ... then the demand for labour, and the fund for the subsistence of the workers, both clearly increase in the same proportion as the capital, and with the same rapidity.

Hence $L = \underline{L} = K$. Next he sets out how this, and especially the proportional growth of the middle term, is unlikely. Marx takes the ‘value of labour-power’ to be a historical datum around which the actual price of labour-power fluctuates, $w^*\Pi$ stands for this datum and $w'\Pi$ for the negative or positive fluctuation around it.²²

$$W \equiv w\Pi \equiv (w^* + w')\Pi \quad \text{[definition] (13)}$$

Therefore:

$$\underline{W} = w \quad \text{[reduced form of 4b and 13] (D)}$$

Wages may fluctuate because the growth in K may outrun the growth of labour-power (i.e. the supply), so inducing rising wages (763, 769). Accumulation then still goes on but at a lower rate (since the wage rise affects the rate of surplus-value and hence S). With the decreased rate of growth of accumulation, wages will decrease (770). Thus we have the relations (14) and (15a).

$$w = f(l) \quad [f > 0] \quad \text{[determination] (14)}$$

²² See also Bellofiore's Chapter 7. Marx began the text discussed in section 2.2 above, by addressing wage reduction, thus dropping his previous assumption ‘that wages were at least equal to the value of labour-power’ (747-8).

where l is the growth in the ‘demand for workers’ (763). This relation, including its ‘right to left’ determination, is of *key* importance to *all* of Marx's further reasoning in this chapter, including his critique of ‘Malthusian’ doctrines (section 3.3 below). This cannot be stressed too much. Marx amplifies on it at the beginning of the next section, where he refers approvingly to Adam Smith (not only is he usually ‘moderate’ in tributes to Smith, it is also one of the scarce ‘in text’ references – i.e. instead of in a footnote):²³ It is not the absolute magnitude but ‘the degree of rapidity of that growth’ in accumulation which is relevant for a rise of wages (772).

Marx posits *in this section* (763, indeed it is conditioned by 12a – cf. 772):

$$l = K \quad \text{[determination] (15a)}$$

And hence:

$$w = f(K) \quad [f > 0] \quad \text{[reduced form of 14-15a] (E)}$$

Marx lays particular stress on this relation by his formulation: ‘To put it mathematically: the rate of accumulation is the independent, not the dependent variable; the rate of wages is the dependent, not the independent variable’ (770).

Thus whereas the nominal wage is affected by the productive forces (equation B), the real wage is affected by the rate of accumulation (therefore also the nominal wage, *ceteris paribus*, the productive forces).

Hence we have, what Marx calls, *the law of capitalist production* (771), that is, the rate of growth of the real wage (w) depends via the rate of growth in accumulation (eqn D) and the ratio of accumulation ($\hat{a}$ in eqn 2) on the rate of surplus-value (eqn 3):

$$w = f(\Delta e) \quad [f > 0] \quad \text{[reduced form of 2-3, 4b, 9-15a] (F)}$$

This is very interesting. We have the apparent paradox that an increase in the rate of exploitation generates an increase in the real wage rate. In fact it would seem (on the basis of the current conditions and *ceteris paribus* qualifications, especially 12a and 4b) that given some rate of exploitation, the real wage rate stabilises at some level at which its rate of growth has become zero (or oscillates around that point). ‘The rise of wages is therefore confined within limits that not only leave intact the foundations of the capitalist system, but also secure its reproduction on an increasing scale’ (771); that is, most briefly, a positive rate of exploitation.

3.2. Increasing capital composition – the acceleration triple

In Section 2 of Chapter 25 Marx introduces the variation in the composition of capital, notably its increase.

Marx's definitions of his three variants of the capital composition (we have talked about two of them) are not crystal clear. Their interpretation is of some importance to the interpretation of *Capital III*, Part Three – where the composition of

²³ That is, in the theoretical sections of *Capital*.

capital reappears. However, for the general interpretation of the current Chapter 25, Marx's specific definitions are not very important. He knows that each concept has its limitation and he just shifts terms according to the state of his analysis (even if not always consistently).

Non-controversial is the value composition of capital (vcc), which is defined as (762):

$$vcc \equiv C / V \quad \text{[definition] (9)}$$

Marx writes about the 'technical composition of capital' (tcc): 'As material, as it functions in the process of production, all capital is divided into means of production and living labour-power. This latter composition is determined by the relation between the mass of the means of production [mp] employed on the one hand, and the mass of labour necessary for their employment on the other [l]' (762). Thus we can safely render:

$$tcc \equiv mp / l$$

Of course this is no more than an intuitive notion, as especially mp cannot be measured without prices. Controversial is the term 'organic composition of capital' (occ). Marx writes a bit cryptically: 'There is a close correlation between the two [i.e. vcc and tcc]. To express this, I call the value composition of capital, in so far as it is determined by its technical composition and mirrors the changes in the latter, the organic composition of capital' (762). It seems to me that two interpretations square with Marx's text:

$$occ_y \equiv C / (V + S) \quad \text{[definition] (16)}$$

$$occ_l \equiv C / l \quad \text{[definition] (10)}$$

Note that over time this occ_l does not reflect change in the tcc to the extent that productivity rise is translated in price decrease (of means of production). The vcc and the occ_y bear similar problems in different ways.²⁴

The differences are relevant in so far that each concept has its limitations. First, the vcc is not independent of wage changes (wage changes affect the ratio; and a wage change – as we will see – may be the effect of an initial change in the vcc). Thus it is no purely socio-technical ratio. Hence Marx evidently also needs another concept, which he reaches via the (intuitive) tcc . The occ_y seems useful to the extent that wage changes (and hence V) are directly translated into changes in surplus-value (S). However, Marx is concerned about another variable, namely the intensity of labour, and the occ_y is not independent of intensity changes, whereas the occ_l is (at least if l is measured in constant intertemporal clock hours – that is how I take it). Each of the concepts is relevant depending on the particular analysis.

²⁴ Marx was well aware of this and points at it several times (e.g. 774). See Fine & Harris (1979: 58-61) for a different interpretation/reconstruction building on this problematic.

Marx, throughout this chapter, is concerned with ‘the average ... composition of the total social capital’ (762-3).

Now that these terminological issues have been addressed, I return to Marx's Section 2 where he introduces increase in the composition of capital. Thus:

$$\underline{vcc} > 0 \quad \text{[thesis] (11b)}$$

$$\underline{occ} > 0 \quad \text{[thesis] (12b)}$$

... the development of the productivity of social labour becomes the most powerful lever of accumulation. ... Apart from natural conditions ... the level of the social productivity of labour is expressed in the relative extent of the means of production that one worker, during a given time, with the same degree of intensity of labour-power, turns into products.

(F, 772-3; G, 650)

However, and as we will see in the next section in some more detail, this is not a linear process (774):

The relative magnitude of the part of the price which represents the value of the means of production, or the constant part of the capital, is in direct proportion to the progress of accumulation, whereas the relative magnitude of the other part of the price, which represents the variable part of the capital, or the payment made for labour, is in inverse proportion to the progress of accumulation.

From the remainder of the section (and the next) it is obvious that Marx takes these proportions as variable, thus:

$$C = \varphi'K \quad [\varphi' \text{ variable and } \varphi' > 1] \quad \text{[determination]}^{25} \quad (11c)$$

$$V = \varphi K \quad [\varphi \text{ variable and } \varphi < 1] \quad \text{[determination]} \quad (11c')$$

(The implication is a modified version of equation (E).) On the same page Marx writes about ‘the variable part of capital ... that this by no means thereby excludes the possibility of a rise in its absolute magnitude’ (thus $\varphi > 0$). He also writes that these changes ‘provide only an approximate indication of the change in the composition of its material constituents’ (i.e. the *tcc*) because of the price changes that go along with ‘the increasing productivity of labour’ (774). (Thus implicitly he says that these price changes may unevenly affect the two components.)

This increasing productivity along with increasing productive forces and the changing composition of capital is the main theme of the rest of this Section. Without deriving further conclusions, Marx connects the changing capital composition with the production of relative surplus-value (Part Four) and price decrease (Chapter 24, discussed in my section 2.2). Recall the synthetical equation:

²⁵ The determination here or in the next equation lies in the variable φ' which represents the result of capitalist behaviour directed at accelerating accumulation.

$$\Delta K = f(\Delta pfl) \quad [f > 0] \quad [\text{reduced form of 2–8}] \quad (C)$$

First Marx posits the mutual dependency of these two factors, in fact already anticipated by the end of Chapter 24, Section 4. Because of this mutual dependency ‘it appears’ [*erscheint*] – this is no delusion – that ‘All the forces of labour project themselves as forces of capital ...’ (F, 756 amended; cf. G, 634). Here he writes:

all methods of raising the social productive forces that grow up on this basis [capitalist production] are at the same time methods for the increased production of surplus-value, or surplus product, which is in its turn the formative element of accumulation. They are, therefore, also methods for the production of capital by capital, or methods for its accelerated accumulation.

(F, 775 amended; G, 653)

Next he connects these methods for accelerating the accumulation of capital with the composition of capital (776):

These two economic factors [eqn C] bring about, in the compound ratio of the impulses they give to each other, that change in the technical composition of capital by which the variable component becomes smaller and smaller as compared with the constant component.

Thus we have the triple accelerating growth of:

The working out of this schema is postponed until Marx's (and my) next section.

The remainder of the current section is devoted to the ‘tendency to centralization of capital’. In the face of Marx's method it is rather surprising to find that, here, it is a phenomenon related to the competition *between* capitals, which should have been dealt with in or after Part Two of *Capital III*. Marx is aware of the limitations of his analysis (777): ‘The laws of this centralization of capitals ..., cannot be developed here. A few brief factual indications must suffice’ (these are provided in about three pages).²⁶ I merely note that Marx (here) does not treat centralization in reference to the cycle.

²⁶ I am not suggesting that anything introduced should be grounded at that same level of abstraction. I question the systematic need for introducing it at all here. There is no need. (In fact it plays a role in the rhetoric of the brief Chapter 32 – a chapter loaded with assertions instead of arguments.)

3.3. Progressive growth – a dialogue on limitations of the theory so far

It is obvious from the text of Chapter 25, and especially Section 3, that Marx struggles with the dynamics consequent on the rising composition of capital. In a dialogue-like fashion he moves from argument to counter argument (though in the sub-headings below I have made this process more explicit than it is in Marx's presentation).

Before reporting on this 'dialogue' I should make a terminological point. Readers of *Capital* may wonder why Marx when addressing 'unemployment' apparently uses such bombastic terminology: 'reserve army of labour', 'surplus population', or 'redundant working population'. He may have had his reasons for the particular choice, but the simple point is that in his day the term 'unemployment' (or its German equivalent) just did not exist.²⁷

A. Progressive growth. Marx begins by setting out the (general?) effect of a rising capital composition on labour:

the demand for labour ... falls progressively with the growth of the total capital, instead of rising in proportion to it, as was previously assumed [Section 1]. ... and at an accelerated rate ... With the growth of the total capital, its variable constituent ... does admittedly increase, but in a constantly [*beständig*] diminishing proportion.

(781-2; G. 658)²⁸

Hence the *ceteris paribus* relation of Section 1

$$l = K \quad \text{[determination] (15a)}$$

is modified into an exponential relation: l increases with K , but at a decreasing rate:

$$l = K^\varphi \quad [\varphi \text{ variable and } 0 < \varphi < 1] \quad \text{[determination] (15b)}$$

Similarly:

$$L = K^{\varphi''} \quad [\varphi'' \text{ variable and } 0 < \varphi'' < 1] \quad \text{[determination] (11d)}$$

B. Continuous accelerated accumulation with pauses. It is, however, more complicated, as the acceleration seems to occur with intervals: 'The intermediate pauses in which accumulation works as simple extension of production on a given technical basis are shortened' (782). Apart from this, the 'accelerated relative diminution of the variable component [of capital] ... produces ... a relatively redundant working

²⁷ Rodenburg (forthcoming) provides further details.

²⁸ Here and elsewhere I insert the German term *beständig*. For 'constant' in the mathematical sense of unchanging the German would likely be *Konstant* (or perhaps *gleichbleibend* or *unveränderlich*).

population' (782). (Thus he implicitly assumes something near to constant population growth, or at least one that does not decelerate to the extent that accumulation accelerates.)

C. Periodic changes. Next he qualifies this (782-3, italics added):

If we consider the total social capital ... the movement of its accumulation sometimes causes periodic changes (...); in all spheres, the *increase* of the variable part of the capital, and therefore of the number of workers employed by it, is always connected with violent fluctuations and the *temporary production of a surplus population*, whether this takes the more striking form of the extrusion of workers already employed or the less evident, but not less real, form of a greater difficulty in absorbing the additional working population through its customary outlets.

This sentence contains some cryptic elements, but the idea seems clear. In a half page footnote he shows census figures of employment for 1851 and 1861, diverging branch-wise. Note that the periodic changes or fluctuations are not theorized, but implanted into the presentation.²⁹

Thus under *A* (and next *B*) Marx posits a specified recapitulation of his theory of Section 2. The fluctuations (*C*), however, do not fit the theory developed so far.

D. Once again progressive growth. Then again he redresses (783-4, italics added):

The working population ... produces both the accumulation of capital and the means by which it is itself made relatively superfluous; and it does this *to an extent which is always increasing*. This is a law of population peculiar to the capitalist mode of production ...

E. Cyclical path as characteristic. But once more he shifts perspective (785-6, italics added; cf. G, 661-2):

The path characteristically described by modern industry, which takes the form of a decennial cycle (interrupted by smaller oscillations) of periods of average activity, production at high pressure, crisis, and stagnation, *depends* on the constant [*beständigen*] formation, the greater or less absorption, and the reformation of the industrial reserve army (...) Just as the heavenly bodies always repeat a certain movement, once they have been flung into it, so also does social production, once it has been flung into this movement of alternate expansion and contraction. Effects become causes in their turn, and the various vicissitudes of the whole process ... take on the form of periodicity.

²⁹ Not only would an 'increase ... in the rapidity of the change in the organic composition of capital' (783) itself require explanation, more important is that it does not explain cyclical turning points, nor why 'pauses' would be associated (if so) with downturns and increasing surplus population (if so). A theory can be constructed on the basis of these elements (and others – see *Capital III*, Part Three), but Marx does not do it here.

This is interesting, but in fact Marx appends an empirical phenomenon to the theory without explaining it, i.e. without theory (the metaphor is a phenomenal analogy, no analogous explanation). In particular, Marx does not tell how the phases of this 'path' relate to the development of capital composition or all of – what I have called – the 'acceleration triple'. It is interesting because he posits the obvious limitations (empirically) of the theory so far (good scientific practice).

F. Wages. A final issue enters the dialogue, namely wage increase.³⁰ Marx denies any relation between population growth and the decennial cycle (he cites Malthus: 'From the nature of a population, an increase of labourers cannot be brought into market in consequence of a particular demand till after the lapse of 16 or 18 years ...' – 787). He also rejects the doctrine that 'restraint' on the part of the working population should be the remedy for the diminution of the 'surplus population' and so the impulse to (real) wage increase (798). Instead Marx posits: (1) the dynamic of capitalist production – with its main element of a rising composition of capital – creates a 'relative surplus population' (the 'progressive growth' thesis – A and D in the dialogue); (2) wage changes do *not* depend on the absolute level of the surplus population, *nor* on the absolute level, or state, of the accumulation of capital: they depend (Adam Smith's insight) on the *change* in the demand for labour. Thus (790):

Taking them as a whole, the general movements of wages are exclusively regulated by the expansion and contraction of the industrial reserve army, and this in turn corresponds to the periodic alternations of the industrial cycle. They are not therefore determined by the variations of the absolute numbers of the working population, but by ... the extent to which it is alternately absorbed and set free.

It may be tempting to read into this quote (and the following) – as many have done – a 'labour shortage' theory of the cycle (in which case, to begin with, the first sentence would have to be a tautology). No, the first part of the first sentence makes Adam Smith's point, and the second part *refers* to the periodic cycle. Marx does not posit the wage rate mechanism to *explain* the cycle; the wage movements *correspond* to it (and if, instead, he believed wage movements to be causative he would certainly have said so). The second sentence combats the Malthusian doctrine.

The next quote (equally from page 790) follows the same pattern – ending with a reference to the generational (16 or 18 year lapse) versus the decennial issue.

The appropriate law for modern industry, with its decennial cycles and periodic phases ... is the law of the regulation of the demand and supply of labour by the alternate expansion and contraction of capital ... It would be utterly absurd, in place of this, to lay down a law according to which the movement of capital depended simply on the movement of the population.

³⁰ All along Marx is aware that wage changes affect the value composition of capital (788-9). Aside from the general line of the argument – but important in itself – Marx indicates that 'with the progress of accumulation' wages may increase along with increasing intensity of labour. This is not particularly related to the cycle, moreover intensity increase generally reinforces the 'production of a relative surplus population' – i.e. relatively less labour working at higher intensity.

Thus, wages are not determining for they are determined by the growth of accumulation of capital.

3.4. *The final two sections*

The final two section of Chapter 25 contain no new theoretical analysis. Section 5 (some 70 pages) provides empirical illustrations for the theses advanced in the chapter. Section 4 begins with a number of ‘surplus population’ distinctions (floating, latent and stagnant). Then Marx summarizes the ‘general law’ – the cycle, though, does not appear in this summary. We have the one moment of the acceleration triple and their effect on the working population.

Marx sets out that on the one hand (for those employed), the worker is degraded to ‘an appendage of a machine’ and alienated from ‘the intellectual potentialities of the labour process in the same proportion as science is incorporated in it as an independent power’ (a conclusion from the middle part of the book). Therefore, ‘in proportion as capital accumulates, the situation of the worker, be his payment high or low, must grow worse’. On the other hand (for those not employed), we have ‘an accumulation of misery’ for the surplus population (799).

Why does Marx, in this section, posit ‘the general law’ apparently unqualified? In the concluding section I expand on theory-systematic aspects; here I address but one theory-empirical aspect.

On the basis of the triple acceleration theory developed through into Section 3, the demand for labour should fall progressively with the growth of capital. However, Marx knows that empirically the development is cyclical. Thus his theory is incomplete (it might be wrong of course). This theoretical problem might have been overcome by combining his theory with, what was later called, a ‘labour-shortage’ theory of the cycle.³¹ He seems to have the material before him to posit such a theory, but he does not do it.³² Instead he makes an empirical reference to the cycle.

But this empirical attitude seems to work in two ways. On the one hand Marx is aware of ‘a ten year cycle’ (in fact, Marx was one of the first to put it on the economists’ research agenda). On the other hand the empirical facts of his day all pointed in the direction of increasing degradation and increasing misery of the working population. Faced with this, the triple accelerator of increasing accumulation and increasing composition of capital together with increasing labour productivity (the reverse of Ricardo) seemed of great explanatory power.

Still, in Section 4 Marx inserts a, seemingly fairly weak, warning about the generality of the law: ‘Like all other laws, it is modified in its working [*Verwirklichung*] by many circumstances, the analysis of which does not concern us here [*nicht hierher gehört*’] (798; G. 674). Note that the warning in the German text

³¹ A major proponent is Itoh (1988: ch. 9). For references see Clarke (1994), who – to be sure – does not take this view.

³² Cf. the relations posited in Section 1, my 3.1. Recall what Marx said about equation (E): ‘the rate of wages is the dependent, not the independent variable’. As we know from *Capital III*, Part Three – drafted before the publication of *Capital I* – his theory of the acceleration triple can be developed into a theory of the cycle (see Reuten, 2004, for the textual evidence based on Marx’s manuscripts).

is much stronger. In the latter it is not, say, the ‘precise working’ that gets modified, but its ‘reality’ its ‘actualization’ (*Verwirklichung*).³³

Summary and methodological conclusions

Throughout the three volumes of *Capital* Marx presents the dynamics of the accumulation of capital in a number of steps. These represent, firstly, a movement from ‘inner determinations’ to outer determinations (not less important). The inner determinations are discussed in *Capital I* and in section 1.3 I set out the delineation of the latter's terrain. Secondly, both between and within the terrains, these steps also represent a movement from simple accounts to more complex ones.

In sections 2 and 3 we have seen how Marx proceeds in this respect. He first discusses the effect of changing productive forces of labour on the acceleration of accumulation (keeping real wages and the composition of capital constant and neglecting any problems of the growth of labour) (section 2.2). Next he discusses the effect of accumulation of capital on the growth of labour employment and the possible real wage changes along with it – resulting in an oscillating growth in real wage rate determined by an oscillating growth rate of exploitation (here keeping constant the productive forces, prices and the composition of capital) (section 3.1). Finally he drops all the assumptions just mentioned (keeping intact those set out in 1.3) and so arrives at, what I have called, the acceleration triple of capital accumulation, productive forces of labour and composition of capital (section 3.2). Taking their multiple interaction together at first seems to result in a continuously growing ‘surplus population’ (unemployment is the later term). As Marx sets out, however, this is contrary to the empirical observation of a fairly regular cyclical movement. Thus the theory is incomplete. Because, in Marx's view, a theory of the cycle cannot be developed at this level of abstraction (more is needed: the terrains and concepts developed in Volumes II and III of *Capital*); instead he just appends empirical observations to the theory developed so far and postpones explanation (and synthesis).

All this is theoretically and historically (1867) most exciting. From the point of view of a systematic-dialectical methodology (and many other methodologies) all this is fine. We reach a point at which the presentation so far is insufficient, so we must go on (in this case to the analysis to be covered in other volumes of *Capital*). It is also acceptable, at this point, to *blend out* (or bracket) the insufficiency, on the condition that it is made crystal clear that this ‘blending out’ is procedural. Marx is reluctant to do this (the blending out) in his Section 3 of Chapter 25 (section 3.3 above); but he does do it in his summarizing Section 4. In the latter section Marx also gives a procedural warning, but in the English text this warning is greatly deemphasized (section 3.4 above). However, to fully understand the warning (in both languages) the reader must remember that about 90 pages earlier Marx signals that he is presenting a ‘*pure* analysis of the process’ which ‘demands that we should, provisionally, disregard all phenomena that conceal the workings of its inner

³³ With Hegel's *Logic* in mind the qualification is even heavier. (Aveling's translation – Marx 1867MA: 603 – is the same: ‘working’.)

mechanism' (710). (English readers were not much helped by the translators rendering of *reine Analyse* into 'exact analysis'.) What is more, to understand that 'inner' and 'outer' mechanisms are necessarily *inseparably* connected, the reader has to have at least 'leafed' through Hegel's *Logic*.³⁴

This must give rise (and has given rise to misunderstandings about Marx's 'general law of capitalist accumulation'. The neglect that Marx's general law is merely posited as a 'moment', has been fostered by the view Engels expressed in his Preface to the English edition of *Capital I* (1886): namely, that Volume I is 'in a great measure a whole in itself, and has for twenty years ranked as an independent work'. Although, strictly speaking, the indication 'whole *in itself*' is correct, Engels's statement carries the impression that a missing of Volumes II and III is no big deal.

As indicated, in Volume I Marx does not present – and methodologically could not present – a theory of capital centralization or a theory of the cycle. *A fortiori* he presents no labour-shortage theory of the cycle. In section 3.3 (especially its heading F) I have provided textual evidence for my interpretation. What is more, only a little reconstruction of the relationships that Marx posits might generate a cyclical *pattern*. It would be a grave underestimation of Marx (and all of his insights on dynamics point against it) to believe that he was not aware of this. He just did not want to posit this theory, at the level of the 'pure' 'inner mechanism' of the production process of capital.

Bibliography

Superscripts indicate first and other relevant editions; the last mentioned year in the bibliography is the edition cited.

- Bellofiore, Riccardo (2004), Marx and the macro-monetary foundation of microeconomics, Chapter 5 in this volume.
- Clarke, Simon (1994), *Marx's Theory of Crisis*, London/New York, Macmillan/St Martin.
- Fine, Ben & Laurence Harris (1979), *Rereading Capital*, London, Macmillan.
- Itoh, Makoto (1988), *The Basic Theory of Capitalism*, London, Macmillan
- Marx, Karl (1867¹G, 1890⁴), *Das Kapital, Kritik der politischen Ökonomie, Band I, Der Produktionsprozeß des Kapitals*, MEW 23, Berlin, Dietz Verlag 1973.
- (1867¹MA, 1883³), *Capital, A Critical analysis of capitalist production, Volume I*, trans. of the 3rd German ed. by Samuel Moore & Edward Aveling (1886¹), London, Lawrence & Wishart 1974.
- (1867¹F, 1890⁴), *Capital, A Critique of Political Economy, Volume I*, trans. of the 4th German ed. by Ben Fowkes (1976¹), Harmondsworth, Penguin Books, 1976.
- Murray, Patrick (2000-2002), Marx's 'truly social' labour theory of value: Part I, Abstract labour in Marxian value theory, *Historical Materialism* 6: 27-66; Reply to Geert Reuten, *Historical Materialism* 10.1: 155-176.

³⁴ This is a paraphrase of Marx in a letter to Engels at the time (1858) when he drafted *Capital*.

- (2004), The social and material transformation of production by capital: formal and real subsumption in 'Capital Volume I', Chapter 8 in this volume.
- Reuten, Geert (2003), Karl Marx: his work and the major changes in its interpretation, in Warren Samuels, Jeff Biddle & John Davis (eds), *The Blackwell Companion to the History of Economic Thought*, Oxford, Blackwell: 148-166.
- (2004a), Productive force and the degree of intensity of labour, Chapter 5 in this volume.
- (2004b), 'Zirkel vicieux' or trend fall?; the course of the profit rate in Marx's 'Capital III', *History of Political Economy*, 36/1: 163-86.
- Reuten, Geert & Michael Williams (1989), *Value-Form and the State; the tendencies of accumulation and the determination of economic policy in capitalist society*, London/New York, Routledge.
- Rodenburg, Peter (forthcoming), PhD Thesis in preparation, University of Amsterdam, Department of Economics
- Smith, Tony (1990), *The Logic of Marx's Capital*, Albany, State University of New York Press.
- (2004), Technology and history in capitalism: Marxian and Neo-Schumpeterian perspectives, Chapter 9 in this volume.