

THE BINARY ALTERNATIVE & THE FUTURE OF CAPITALISM

BY
MARK DOUGLAS REINERS

12726 VENICE BLVD.#4

LOS ANGELES, CALIFORNIA 90066-3745

TELEPHONE: 310-390-6572

FAX: 310-398-3763

E-MAIL: markreiners@hotmail.com

We are living through a political crisis of the Transfer State: the United States has reached social and political limits beyond which it has become very difficult to squeeze the wage earnings of the working population for the benefit of those who do not earn wages. The signs and symptoms of this crisis are essentially everywhere: in the drive to cut the federal budget, in welfare reform, in the continuing debate over health care, in recurring drives to “reform” and privatize the social security system.

Professor James K. Galbraith, *CREATED UNEQUAL: THE CRISIS IN AMERICAN PAY*

It sometimes takes decades, even centuries, for foundation-altering ideas to permeate the social hierarchies that prescribe and reward acceptable mainstream thought while ignoring and marginalizing the rest.

Nevertheless, with the collapse of much state communism; with the growing recognition that the surviving capitalist economies are facing worsening problems in achieving a just and efficient distribution; and with increasing calls for new alternatives beyond right, left and center, there is some reason to hope that people are sincerely ready to take a fresh look at economic assumptions. That look will come not a moment too soon.

Robert Ashford & Rodney Shakespeare, *BINARY ECONOMICS: THE NEW PARADIGM*

ABSTRACT

A growing chorus of respected scholars, including Lester Thurow, James Galbraith, Edward Luttwak¹ and numerous others, have subjected the uncontrolled, globalized capitalism that has rapidly spread since the end of the Cold War to the harsh light of ruthless scrutiny in recent works. These important critiques are especially cautionary in the expressed concern that the imbalances of wealth distribution, which grow increasingly pervasive, are not subject to the policy consideration warranted by their severe implications.

Unfortunately, the humane and well intended policy prescriptions invoked in these works range along the existing liberal/conservative spectrum: skills training, return to Keynesianism, return to regulation, etc.. Not only is it nowhere considered that these problems may reflect some flaw or inadequacy of underlying theory, it is explicitly asserted that no choice other than these exists. We argue that this is false on both counts; that there *are* inadequacies in existing theory, and there *is* a prescriptive alternative. We argue that the alternative is the too-long-ignored and/or marginalized Binary Theory of economics developed by the late Louis Kelso.

We provide a brief overview of the necessary definitions to challenge and find unsound a core, if obscure, criticism of Binary Theory: that its distinct, foundational productiveness concepts violate the allegedly necessary symmetry condition of conventional productivity analysis and are therefore theoretically illegitimate. Next, we engage considerations of the Information and Knowledge-Value economy. We do so since another line of critique of Binary economics is founded on the assumption or

¹ Lester C. Thurow, *THE FUTURE OF CAPITALISM: HOW TODAY'S ECONOMIC FORCES SHAPE TOMMORROW'S WORLD*.

James K. Galbraith, *CREATED UNEQUAL: THE CRISIS IN AMERICAN PAY*

Edward Luttwak, *TURBO-CAPITALISM: WINNERS & LOSERS IN THE GLOBAL ECONOMY*

assertion that these increasingly important factors render irrelevant any work whose primary theoretical and policy prescriptive focus promotes as remedy universalizing capital ownership as does Binary Economics. We argue that these reasons for dismissal are unsound both because they ignore Binary modifications to the definition of capital, and because of unrecognized constraints *in* the “Information economy”.

Finally, we guide attention toward the more speculative prospect of what may be the ultimate threat and challenge to the limitations of extant, productivity-based, laboristic Capitalism. We introduce the idea of an “infinite productivity horizon”. While these considerations are more long term in nature they may also provide a more expansive perspective from which to consider the possibility that, in the sweep of history, there may well be a thrust of near inevitability to the ultimate recognition and implementation of a Binary Economic system, as the nearly exclusive reliance on a laboristic wealth distribution mechanism becomes increasingly untenable.

INTRODUCTION

Binary Economics asserts that existing Capitalist, Market theory is incomplete in several critical, fundamental respects. Consequently, it further contends that existing Capitalism has remained locked in an economically inefficient and socially unjust system for the distribution of wealth, unnecessarily constrained by a nearly exclusive and anachronistic dependence on labor/jobs for this distribution function. After appropriate modifications of theory, it proposes that this insufficient reliance can be supplanted with a gradual, universal expansion of capital ownership, providing for a remedial, much more efficient, just, self-equilibrating and sustainable social as well as economic system.

While the theory of Binary economics is comprised of a detailed explication of the trio of propositions, 1.) the productiveness and the *independent* productiveness of capital, as concepts unique and distinct from the traditional economic concept of productivity, 2.) the Binary private property right, and 3.) the concept of Binary growth, our focus on select aspects of these will necessarily be more constrained due to the limits of this format. We will direct the reader to the rich existing Binary literature² for the much more thorough foundational background.

KEY DEFINITIONS:

For purposes of clarity and conciseness, we can perhaps do no better in providing definitions for both the traditional concept of productivity, as well as the Binary concept of productiveness, than to quote from the wonderfully lucid essay, LOUIS KELSO’S BINARY ECONOMY, by Syracuse Professor, Robert Ashford.³

² Louis Kelso & Mortimer Adler. (1958) *The Capitalist Manifesto*, Louis Kelso & Mortimer Adler. (1961) *The New Capitalists*, Louis Kelso & Patricia Hetter (1967) *Two Factor Theory: The Economics of Reality*, Louis Kelso & Patricia Hetter-Kelso (1991) *Democracy and Economic Power: Extending the Esop Revolution Through Binary Economics*, Robert Ashford (1990) *The Binary Economics of Louis Kelso: The Promise of Universal Capitalism*, Rutgers Law Journal, 22, 3-120, Robert Ashford (1996) *Louis Kelso’s Binary Economy*, The Journal of Socio-Economics, vol. 25, #1.

3. Louis Kelso’s Binary Economy, by Robert Ashford, Professor of Law, Syracuse University. Vol. 25, #1, 1996. The Journal of Socio-Economics.

“Productivity is the ratio of the output of all factors of production, divided by the input of one factor, most usually labor. In contrast, productiveness may be thought of as total work done by each factor. *In relative terms, it can be expressed as the percentage of total output attributable to the productive input of each independent factor.*” (My emphasis.)

Since the productivity concept is so long standing we will assume pervasive familiarity and move on to provide an illustrating example of productiveness often used in the Binary literature. Again, Professor Ashford provides compelling clarity.

“To explore the concept of productiveness and its relationship to productivity and growth, assume that in a pre-tool age, a person could dig a hole in four hours by hand. After the invention of a shovel, she can dig the same hole in one hour. In traditional economic terms, she has four times the productivity because she can perform four times as much work in the same time period. In binary economic terms, the productiveness has changed from 100% labor before the invention of the shovel, to 25% labor and 75% capital after the employment of the shovel. In terms of producing the hole, the worker contributes only one-fourth as much productive input, so her labor productiveness per hole has been reduced to only one-fourth of its former value. Seventy-five percent of the worker’s former productiveness has been replaced by an equal amount of capital productiveness. Therefore, in this example, *although capital may increase human productivity, more significantly, in binary terms, it replaces labor productiveness per unit of output.*” (Emphasis in the original.)

With this explanation of productiveness as foundation, Binary Theory then goes on to explicate what is already inherently implicit by asserting that capital thus manifests the property of being *independently* productive, and that this property may obtain to a *relative* degree with respect to the output of any particular production function. It is the assertion of this productive independence of capital that seems to be the source of such confusion and contention.

SYMMETRY

When Binary critics wish to deal what they seem assured is the knockout blow to any hope that Binary theory may have to a claim of legitimacy for its distinct propositions of productiveness, and the independent productiveness of capital, the big gun rolled out from the productivity arsenal is the Symmetry artillery.

It may be illuminating to note that invocation of the alleged Symmetry imperative is often made with an implicit confidence that it carries with it something like the axiomatic mantle of logical necessity associated with the closely related mathematical concept of commutativity, familiar from basic number theory (arithmetic). That it does not, in reality, have anything remotely like such fundamental logical necessity is what should ultimately allow us to deflate the use of this argument as grounds for dismissing these core Binary concepts. Strictly speaking, productivity-based symmetry only asserts input factor substitutability and then, only on a very conditional basis. Formal assertion of actual commutativity is not explicit and only emerges as a de facto claim by the

apparently more zealous and less attentive adherents to the argument, based on the special case of a 1:1 input-factor substitutability ratio, which is a very special case of the defining scenarios indeed. Once the special nature of this case is illuminated, however, it begs the question of logical necessity since conditions of *non*-commutativity are so widely pervasive elsewhere throughout the natural sciences and mathematics. In fact, as we shall see, this special case actually reveals a particularly rich irony quite favoring the Binary position.

It may also be worth mentioning that both the conventional productivity and Binary productiveness propositions are simply that: propositions or characterizations for defining production input factor relationships to output. As such, excluding demonstration of logical necessity to the contrary, there need be no reason why they must be mutually exclusive of one another as a basis for economic analysis. Indeed, Binary economists make no such exclusionary claim; asserting only a complimentary relationship between distinct sets of propositions, while admittedly arguing for a status more fundamental and more useful for the productiveness propositions. Only the determined Binary critics seem to feel a need to find or construct some basis for justifying an assertion of exclusivity for the productivity/symmetry perspective. Regardless of this bias, however, there is no a priori, epistemological basis to justify regarding productivity arguments, symmetry based or otherwise, as *the* objective conceptual standard in terms of which to either divinely bestow acceptance or from which to pronounce Oracular judgements of dismissal upon the Binary productiveness concepts.

While the illustrative Binary hole-digging scenario and the attendant inference of a relative, but dominant productive participation role for the shovel (Capital/K) in the output seems intuitively straightforward and perfectly sound empirically, the subsequent use of the term *independent* with respect to this productive capital participation tends to connote autonomy of action; an autonomy that would seem belied by the functional role of the labor also participating, though, productively speaking, to a lesser degree according to both common sense and Binary theory. Here, the traditional economists interrupt. What about the symmetry imperative? According to productivity, they assert, the output must be invariant to a reversal of order in applying the input factors. Thus, while Binary skeptics are protesting, ‘wait a minute – how can an input factor be productive independently without being functionally autonomous’, and while Binary theorists are responding by pointing out that this fails to take into account the important modifying term *relative* applied to the productiveness of the respective inputs, the devoted Binary critics among conventional economists insist that autonomy is a non-issue, demanding satisfaction of an imperative that would seem to be a clear commutativity condition with respect to applying the input factors – this alleged law of symmetry. In the Binary case, that would seem to mean expecting the output of holes dug to remain unchanged regardless of whether we start with the shovel and add the laborer or vice versa. Since the shovel is clearly not going to produce any output by itself, independent productiveness of capital is a fraud, or so the conventional economist/Binary critics assert. Something would clearly seem to be amiss. But *is* commutativity really what is asserted by the symmetry defined in the productivity context? The short answer is, ‘no’, it is not. Symmetry is the word chosen to denote

conditions in a definitionally specific production-flow scenario where input-factor *substitutability*, not unconditional commutativity, obtains. Given the fact that, as we shall see, the constraints imposed by these definitional scenarios render the property of input-factor substitutability a highly contingent and far from universal one, but one not categorically exclusive of special cases of commutativity, the fuller answer is, 'not exactly'. The Binary- favorable irony lies in wait amid the remaining unpacking.

Synopsizing familiar textbook presentations, two limiting cases of substitutability can be identified. First, suppose that we are discussing a firm with a single production activity to execute. For example, a production activity requiring use of three machines and five people to produce one unit of product, X, per unit of time; six machines and ten people to produce two units of X, etc. If we only have six machines, maximum attainable output will be limited to 2X, regardless of the number of workers available beyond the ten required for this output, *given* the six machines. According to these rather idealized limiting strictures, additional workers can produce nothing without equipment with which to operate. Similarly, if the labor force is twenty five, output has a fixed maximum output of 5X, even if we have indiscriminately more machines than the fifteen required for this output. Additional capital can't increase output without additional labor made available in fixed proportion to capital. Thus, symmetry simply does not obtain here, importantly already putting conditions on symmetry that belie anything like the lawfulness associated with generic commutativity.

Second, let us now suppose that technology is such that a unit of capital used can do exactly the same job as a certain number of workers. Such a case is highly possible if capital takes the form of robots. From the viewpoint of output, we could therefore either use an additional robot (K/capital) *or a certain number of additional workers* to produce a given increment of production. In this case, K and L are said to be perfectly substitutable; i.e. symmetric. However, though $X = f(K, L) = aL + bK$, the special case where $a=b=1$, and inputs can be substituted at a 1:1 ratio, is *required* for a symmetry in any way resembling a general commutativity condition to obtain. Why is that important?

We will first note that the original denial of the conventional economist, asserting that functional autonomy of the capital instrument is a non-issue, is clearly revealed as incorrect. In fact, that understates the case. Not only is it *not* a non-issue, the defining scenarios reveal it to effectively be a condition. Also, though symmetry would seem to verbally allow substitution between capital (robot) and laborers (emphasis on the plural), this already special case must be even more special for any assertion that symmetry is generally equivalent to mathematical commutativity to obtain. It must be not merely between the categories of K and L, in principal allowing *a certain number of additional workers*, it must be 1:1 between actual units; robot/laborer. Not plural. This is a special case of a special case. Anything that deviates from this is not merely a circumstance where symmetry simply is not applicable, as in the previous case; it is an explicit case of ASYMMETRY. And this is the point. It is precisely giving meaningful characterizations of such far more generically applicable circumstances of *asymmetric* input factor relationships to output that Binary productiveness provides!

To explicitly accentuate the irony of asserting that symmetry arguments are either necessary or sufficient to deny legitimacy to the distinct Binary concept of the relative productiveness of L and K inputs to output, the only scenario where completely homogenous substitutability/symmetry obtains, according to the very productivity-based,

production-flow definitional conditions imposed by the conventional argument, and invoked by economists aiming to discredit the binary concepts on these same grounds, is the one condition where productivity effectively reaches infinity in the form of complete capital autonomy - the very property that was originally asserted to be a non-issue - such as in robotic production. The irony could scarcely *be* more rich. The reason that these critical contingencies so heighten the irony of the alleged symmetry-critique is precisely because productivity is generally a labor-centric indice, for which infinity is meaningless by virtue of connoting absence of a labor factor participation. Conversely, Binary productiveness, being input-factor agnostic, simply recognizes this ‘special’ case as the perfectly legitimate and meaningful instance of capital achieving relative productiveness of 100%. But look more closely. The key distinctions made explicit in the productiveness concept are lost to, or are apparently of no significance to the productivity/symmetry argument. Specifically, beyond the *very* special case of actual satisfaction of 1:1 substitutability, the question of how *much* labor would have to be substituted to render the substitution output neutral/equivalent. As soon as these considerations are introduced, so too is the differential of any situation deviating from perfect 1:1 substitutability, which Binary productiveness answers in any symmetric *or* asymmetric scenario with explicit percentage answers, covering the spectrum from 0 to 100%. This essentially *makes* the Binary case in favor of the legitimacy and relevance of the productiveness concepts of relative, simultaneous input participation. In other words, generally speaking, substitution is *not* going to be symmetric; is not going to be on a one-to-one basis; not with respect to either the number of laborers substituted for robots (capital/K), or the amount of time required to achieve output neutrality/equivalence. But there is more.

We can provide even greater perspective on how convoluted the conventional wisdom becomes. In fact, it may already be clear to the particularly attentive reader that the productivity argument essentially uses the one special production-flow case where “symmetry” actually does obtain in some sense of homogenous substitutability, segregates this from the highly contingent nature of the defining scenarios of the argument, falsely elevates this isolated “symmetry” to the level of generic equivalence with the commutativity condition, and then returns to the Binary examples of productiveness (e.g. the laborer and shovel) and demands that legitimacy of the productiveness definitions can *only* obtain if we can expect unchanged production outputs, regardless of whether we reverse the application order of the inputs, as if *this* condition was remotely satisfied, generally, in the full range of possible productivity-defined production-flow scenarios. This is regardless of the fact that such “symmetry” occurs in their own chosen scenario *only* where the K factor has the complete productive autonomy that is theoretically and distributionally meaningful *only* in the theory that they are attempting to discredit.

While illuminating these points does not *prove* the validity of the Binary productiveness propositions, per se, they certainly help serve to strip the productivity-based, alleged “symmetry imperative” of the authority of any logical necessity in claiming grounds for dismissing them that it may have gained by the undue association with a generic commutativity claim. They should also help make clear what, in fact, has been clear to a growing number of adherents to Binary theory from the beginning – namely that Binary productiveness and traditional productivity indices are simply

conceptually distinct. While the ground that they cover overlaps, and they are thus similar, similarity is not identity, but nor is difference a disproof. Symmetry is highly contingent; it provides no basis of general logical necessity for any claim of exclusivity for the productivity that provides its definitional context, or for exclusion of Binary productiveness. In fact, quite the contrary.

Considering the production possibility frontier more broadly, as we have implicitly done in taking Binary productiveness *quite* seriously, it is clear that linearity does *not* always, or even generally, hold. As we've seen, it is only where linearity does hold that symmetry is relevant. It should not only also be clear that this special case of a special case is, by definition, far from generic, but therefore, that what applies in the absence of genericity for symmetric conditions is precisely what Binary productiveness more comprehensively defines and provides an indice for – the far more generic condition of *asymmetric* productive input-factor participation in output. Thus, what the symmetry argument ironically best serves to illuminate is precisely what should have been clear from the beginning: Binary productiveness and conventional productivity are equally legitimate but distinct conceptual entities. Interestingly, however, conceptual entities with a distinctly complimentary relation. Symmetry reveals that their one key point of intersection is precisely the special case where capital productiveness is at its maximum, and capital is thus productively autonomous, allowing for homogenous substitutability with labor, in principle. Rather than falsely elevating this special case of homogenous substitutability to the alleged status of some immutable law, generically equivalent to commutativity, necessary and sufficient as a basis for dismissing Binary productiveness, conventional economists *should* be recognizing what Binary theorists have long been asserting. Namely, to the extent that conditions of input factor participation in production output are highly *asymmetric* far more generically than not, Binary productiveness is a vastly more potent analytic tool, illuminating relationships regarding wealth generation to which productivity is essentially blind, and distributional and policy implications which are quite profound. Thus, not only should conventional economists not fail to take Binary theory seriously, they *should* be enthusiastically embracing it for providing precisely what the Kelsos and other Binary economists have long asserted it provides – a *very* major missing piece of the puzzle of theoretical Capitalism.

SAY'S LAW & AGGREGATE DEMAND

The considerations above, aside from the relevance of their own clarification, provide a valuable foundation as segue into other critical issues.

First is an important, but little appreciated, consideration pertaining to the already contentious subject of Say's Law - the law asserting that supply creates its own demand. However arcane or naïve invocation of Say's Law may have come to seem, the productiveness concepts provide a new perspective on this relation that is profoundly revelatory. If we finally come to recognize, as Binary economics has long asserted, that capital is independently productive, it is then immediate to also recognize that the self-equilibrating viability of Say's Law is, 1.) a *contingent* property, and *not* a property that it is sufficient merely to assert in theoretical principle and then assume operative as an economic reality, and 2.) that its functional viability will hinge on whether, and to what

extent, the ownership *of* such independently productive capital is constrained or universally distributed.

From a Binary perspective, to the extent that capital ownership is highly constrained and concentrated, the functional viability of the systemic self-equilibration attendant to Say's Law is effectively violated and must be artificially propped up with a patchwork of mechanisms that are both less socially just and also less economically efficient. Without being comprehensive, examples include unions, minimum wage laws, immigration factors, and an endlessly burgeoning, increasingly tenuous Transfer State. This perspective also throws fresh light on the closely related aggregate demand considerations at the heart of the Keynesian prescriptions.

Indeed, from the Binary perspective, the only scenario in which the distributional and aggregate-demand consequences of the extant productivity-based and exclusionary capital-participation regime would be equivalent to a Binary system of universalized capital ownership, is one where ALL of the productiveness increases of capital (technological and other capital rents) were immediately and fully dispersed as either wage increases to retained labor (assuming labor IS retained post capital-productiveness increase, which is often NOT the case per a given production function) or as product price reductions to consumers. The fact that, depending on the general competitive environment, the relative maturity of the business cycle, inflation dynamics, etc, such adjustment effects do incrementally occur *over time* (contingent the relatively autonomous dynamics of those respective sub-markets) is very far from adequate fulfillment of the stated conditions of "immediately and fully", and thus of Say's Law. Further, if there are exclusionary intellectual property factors involved such as patents, etc., we can completely forget the condition of immediacy. Finally, however, even if perfect alignment existed in these areas (which it clearly does not), what ultimately makes any such argument utterly untenable is the critical factor of profits.

At this juncture, defenders of existing dogma will be quick to volunteer as response to this apparent threat to the actual fulfillment of the equilibrating supply/demand imperative of Say's Law the conventional free-market wisdom that profits, savings and wealth concentration generally have no demand, or general growth inhibition effects since these reserves are simply recycled through the banking system as collateral for further investment, generating jobs, wages, etc. While this recycling is unarguably a fact, and thus true as far as it goes, in the rush to invoke this recycling rationale in the hope of laying to rest a possible critical and glaring inconsistency between doctrine and actual systemic behavior, something crucial is glossed over by the conventional wisdom, and lost in the illusion of a final rebuttal. Specifically, something *else* gets recycled along with these reserves. In highlighting this, it is key to point out that *whether* these reserves *will* be invested both fully and with immediacy is always contingent in a way that also *inherently* recycles the very distribution and demand imbalances of any savings-based financial and exclusionary capital-participation regime that this very recycling *allegedly* defuses. Why? Nothing less than the core capitalist incentive. Specifically, the imperative that any *new* investment must offer the prospect of the same productiveness advantages. This is the very wellspring sustaining the proverbial and ever reinforced adage that the rich get richer while the poor get . . . well, poorer, relatively speaking and often absolutely speaking. In this sense, whether new jobs are created, even with higher wages, as well as the fact that they frequently may be,

is effectively incidental; if the new investment does not offer the prospect of wealth generating productiveness benefits that are sufficiently *greater than* any such eventual and incremental increases to labor or losses to price reduction to justify itself, why would any manager/company make them? They would clearly simply be spinning their wheels.

Thus, invoking the logic of this systemic recycling rationale fails to provide the rebuttal hoped for or the resolution needed for the conventional wisdom to pass muster in claiming that the Binary assertion that the systemic self-equilibration property of Say's Law is a victim in this dynamic is unfounded. It fails to provide the "out" which it claims and asserts by taking the recycling logic only self-servingly half way. The negative wealth distribution and, thus, supply/demand discrepancies remain. However real the gradual and incremental wage increases and/or price reductions that, over time, sputter into the market as currently structured, they can never catch the greater wealth generation racing ahead of them in the form of new investments predicated on this requisite criteria of productiveness superiority. Hence, not only is actual fulfillment of Say's Law obstructed by introducing turbulence and negative-feedback-inducing demand lags (cosmetically obscured by the previously mentioned patchwork that must be expanded to include the ultimately unsustainable current levels of consumer credit-card and other debt), it also artificially limits expansion by inhibiting the *growth* inducing positive feedback that would be unleashed by uncoupling investment from the savings/collateral imperative and *coupling* tens of millions of new capital owners (billions globally) with the direct income of *their* newly productive capital. In short, the Binary productiveness concepts suggest that we are paying a staggering societal opportunity cost by not fully trusting the logic of the very capitalism that we purport and never miss an opportunity to ideologically champion.

KNOWLEDGE VALUE & THE INFORMATION ECONOMY

Another line of critique frequently invoked by Binary critics predisposed to imagine, assume or assert that any theory or policy prescription focused, as is Binary economics, on a universal capital distribution program must be, at best, anachronistic and, at worst, utterly irrelevant in an environment where knowledge and information are of increasing relative competitive importance. The subjects of Knowledge-value and the "information economy", are important, subtle and complex topics which, to the extent that they devolve onto issues of human creativity, ultimately engage some of the most epistemologically demanding areas of biological science. Hence, anything remotely like a comprehensive treatment must remain beyond the scope of this paper. But by focusing on a few key economic principles and illustrative examples, we will again hope to illuminate that the inclination to dismiss Binary economics on the basis of these considerations is grossly unfounded.

First to engage is the often only implicit assumption that "capital" can only mean some tangible object: an automobile assembly-line robotic welder, a stamp press, a steel mill, etc. Apparently, because of the fact that most of the examples of productiveness provided in the Binary literature, for purposes of clarity of explication, refer to simple cases of physical production, critics often seem unable to extrapolate the core principle more generally to realize that productiveness is *not* limited to such cases of manifest tangibility. In reality, Binary economists have been quite explicit that this is not the case.

In fact, they have adapted the definition of capital to comprehend much of what is referenced as critical in the Knowledge-Value/Information Economy: “Capital therefore includes land, animals, machines, structures, tools, *and intangibles such as patents, trademarks, trade secrets, and processes.* . . .”⁴(my emphasis). A virtual infinity of examples might be provided of such italicized cases of intangibles forming the basis for wealth-generating independent productiveness⁵, but the principle should be sufficiently clear to make this unnecessary. More important distinctions await elucidation.

More challenging, perhaps, are observations noting that the “Information Economy” allows for the re-synthesis of labor and ‘the means of production’. “The first aspect I want to point to is the likely joining of manpower and the means of production in the creation of knowledge-value. . . . What is important for the production of knowledge-value is not so much facilities or equipment in the material sense, but the knowledge, experience, and sensitivity to be found among those engaged in its creation. This is the true direction toward which the production of knowledge-value points; and this kind of production is inseparably bound up with the manpower that produces it. In a knowledge-value society, the trend toward the separation of capital and labor will be reversed; henceforth they will tend to fuse.”⁶ Similarly, Lester Thurow recently observed, “The transition ahead can be verbally minimized by calling skills, education, and knowledge “human capital.” Doing so makes it sound as if replacing physical capital with human capital is a minor change at most – but it isn’t. While there are similarities, the differences are more important than the similarities when it comes to defining the nature of capitalism when human capital is the dominant factor of production – not just an important adjunct to physical capital.”⁷ First, it may be far more generally the case that ‘human capital’, in the form of knowledge, is instantiated *in* capital than that it *replaces* capital, per se. Further, when Professor Thurow expands on the distinctions between human and physical capital by asserting, “Human capital cannot be owned.”⁸, he is transparently in error. Human capital, as explicit knowledge, clearly *can* and *is* owned pervasively via patents and other forms of intellectual property. Were this not the case, it would not be a long standing procedure in most technically oriented companies to compel technical staff to sign off on surrender of inventions and developments which they may generate for the duration of their employment. Recognition of the importance of intellectual property may be compelling such companies to be increasingly accommodating about sharing such ownership with the developers to retain particularly

⁴ From pg. 5 of BINARY ECONOMICS:THE NEW PARADIGM. Robert Ashford & Rodney Shakespeare.

⁵ Some cases may be of arresting abstractness, including that of a high tech software company implementing a recent breakthrough in the esoteric domain of finite-field mathematics as the basis for patents to make dramatically more efficient and to significantly expand the functional capabilities of the XML computer language. It would be difficult to get less tangible than a break through in an area as abstract as finite-field mathematics. But the key point is clearly that the amount of human calculational effort that would be required to replace what the technical instantiation of these abstract insights allow algorithmically, can leave no doubt that independent productiveness is conceptually far more inclusive than merely cases of gross physical output. Hence the highly equivocal nature of any assumption that there is some mutual exclusivity between the relevance of Binary economics and the “Information Economy”.

⁶ P.267/270 THE KNOWLEDGE-VALUE REVOLUTION:Or A History Of The Future by Taichi Sakaiya.

⁷ P.280/281 THE FUTURE OF CAPITALISM:How Today’s Economic Forces Shape Tommorrow’s World by Lester C. Thurow

⁸ *ibid.*

productive technical staff, but this serves simply to underscore the point that such ownership is both real and taken quite seriously.

More generally, however, these important observations are closely related to the assertion of a general education/skills imperative in an information economy. This emphasis, however, implicitly extends the pervasive and virtually unchallenged assumption that we must systemically be socially utterly dependent for our wealth distribution mechanism on labor, and seems additionally suspect when data are unambiguous about the declining income of even white males with graduate degrees. As Professor Galbraith importantly emphasizes⁹, possibly excepting pockets of certain specialties, there is no general dearth of skilled employees in America. Thus, from a Binary perspective, this distributional exclusivity effectively seems like a curious and foolish kind of economic masochism. But important distinctions remain.

To the extent that this information-economic re-synthesis is real, the labor and product are inseparable, with ownership immediate and exclusive. To the extent that such knowledge-value production is merely application of *existing* knowledge, of whatever professional flavor, it is no less subject to supply/demand diminution of any premium it may enjoy from its relative placement on that spectrum than is traditional labor subject to positive availability changes in the market and/or absence of imposition of exclusionary limitations on such availability. *However*, to the extent that knowledge-value production is, instead, about the creation of novelty rents of either a technological nature (and it is important to clarify that technological rents have two components: novelty and productiveness – the novelty premium is obviously first-mover relative and may erode as competition emerges, while a productiveness increase will be of persisting competitive advantage absent displacement by a higher level of productiveness) or the “social subjectivity” nature importantly distinguished by Mr. Sakaiya¹⁰, things are different. In the former case, the labor is *NOT* the product; the product is a new tool, instrument, technology, process, etc., whose manifest independent productiveness is so eagerly sought precisely *for* its ability to provide the attendant rents of novelty and productive independence, and ownership *of* which is *not* immediate or necessarily exclusive. In the latter case, while the inseparable labor/product condition obtains, the “social-subjectivity” nature of its content makes it vulnerable to countervailing constraints that have profoundly important implications with respect to how justified we are to extrapolate for such production the infinite opportunity, *as labor*, often expected of the “information economy”.

To clarify, these latter considerations are closely related to the information-economic emphasis on the idea - based on the fact that consumption of any unit of information does not exhaust it or preclude its use as a further source for other production or as other consumption - that there is a kind of infinity of *economically viable* opportunity that necessarily follows. This expectation, in turn, is closely associated with ideas that the unlimited product diversification, and/or customization allowed by digital technology potentially provides a basis for knowledge-value production fulfilling these potentials as a possibly equally unlimited source of high-pay, essentially artisan labor. As we might expect, things are not quite so straightforward nor, necessarily, so sanguine, *regardless how high and pervasive the skill level*.

⁹ See, CREATED UNEQUAL: The Crisis In American Pay by Professor James K. Galbraith.

¹⁰ Ibid.

Arguably the most crucial and insightful economic points advanced in Mr. Sakaiya's important book on knowledge-value are the discussions of the subjectivity-related instability of such value and the extent to which the opportunity promise of factors such as diversification and customization, while not vacuous, are constrained by the twin countervailing influences of a "decision-making cost" and time/attention limitations. These limitations, and the more general importance of their implications, can be highlighted by noting that companies representing the very epitome of subjectivity-driven knowledge-value, movie companies, have recently curtailed production plans for highly pertinent reasons. Recognition that as market segmentation (diversification) proliferates via technologies making plausible not merely the once awesome, but now almost quaint idea of a 500 channel universe, but instead a virtually one-channel-per-person universe, economic viability is severely challenged by virtue of a macro-market so flooded with selection that no entry may have sufficient market success to justify its production expense, even as that expense much more closely approaches zero than is the case for current feature film production. In short, the question arises: at what point of intersection does the reduction of audience and limitations of time/attention for search and consumption render this hypothetical infinity of information-economic opportunity practically and economically untenable? It is an interesting and challenging case for matrix, finite-field and combinatorial mathematics. In any case, it is emblematic of precisely the constraining forces of "decision-making cost" and time/attention limitations. And it applies *far* more generally than just to movies. Indeed, it may well be the dialectic flip side of the well known increasing returns, or network effect, so frequently enforced in the information economy; the effect whereby the utility and ultimate economic viability of a product is enhanced proportionate to the number using it. Perhaps ironically, it is precisely because of the fact that instances of network-effect success – such as many of the most well known software companies – tend toward being what is frequently referred to as natural monopolies that the Binary case for universalizing equity ownership is not only far from irrelevant, but is actually *especially* relevant given the extent to which this will be necessary to counter balance their tendency toward the winner-take-all outcomes that, otherwise, heavily contribute to grossly concentrated distributions of wealth.

Thus, a curious paradox emerges between growth of material wealth and growth of information economic wealth. Ironically, while desire for wealth may be generally limitless, the economic viability of the former is practically constrained in principle only by adequate generation and distribution of wealth to create, sustain and secure it, whereas generation and availability of the latter is in theoretical principle limitless but economically ultimately constrained in practical reality by time/attention and decision-making cost factors, *regardless* of wealth availability to create, sustain or secure it. This is the little noted, negative flip side to the fact that knowledge-value production, per se, is frequently not terribly capital intensive, and can inhere in labor, qua labor. Also, however infinite the reuse of information may be or seem in purely abstract principle, its *economically relevant* parsing is far from infinite at any point in time and in any particular context. It is always constrained by what might be referred to as a signification congruence imperative, which may not be quite the antithesis of infinity, but an implicit, effective law of context-dependence certainly renders infinity a grossly excessive claim. These considerations would thus argue, again perhaps ironically, that not only is Binary capital ownership universalization *not* anachronistic or irrelevant in an "information/

knowledge-value” economy, but may be highly facilitating of it precisely by providing not only the greater distribution of wealth to support it, but by also providing the increasing leisure time that such an increasing dynamic of market segmentation requires to minimize the inevitable intrusion of the limiting decision-making and time/attention costs associated with such segmentation. But there is one additional reason why the prospect of knowledge-value production, as a potentially infinite source of premium labor opportunity must be viewed as highly suspect in the longer, though not necessarily very distant, term.

NANOTECHNOLOGY AND THE INFINITE-PRODUCTIVITY HORIZON

Discussions of product/market diversification are frequently contrasted with assembly line mass production: staid, static and incapable of the necessary adaptability to initiate customization at prices tenable to a mass market. Clearly, digital technology has begun to make mass customization viable to a middle class market. What is not generally noted is the reality that the same digital technologies that are rendering this earlier production limitation moot are, themselves, in comparatively very early stages of sophistication. When one looks to the technology horizon, the same technologies (read capital) that may now provide artisan viability to labor production of knowledge-value in the form of intermediary consulting functions (design, style, etc.), will ultimately enable customers, perhaps on something like a virtual utility-like basis, to become *their own* designers, stylists, consultants, etc. In other words, the very proponents of the opportunities associated with knowledge-value production and the information economy may well be under-estimating their own subject and thus underestimating just how deep and far reaching the independent productiveness of capital may become. This possibility takes us to the threshold of our final considerations.

In 1986, K. Eric Drexler released a book entitled, *ENGINES OF CREATION: THE COMING ERA OF NANOTECHNOLOGY*. In it, he discusses the approaching prospect of an ultimate, constructive command over material nature from atoms and molecules up, instead of from bulk materials down. The result would be an explosion of productive capability that would make what has transpired since the Industrial Revolution pale by comparison. A reduction of production costs, making unheard of wealth vastly more pervasively available, was also explicit. Based on the concept of a universal nanoassembler, the result would be self-replication capability, coupled to extraordinarily powerful Artificial Intelligence, allowing for not merely self production, but autonomous modification and adaptation to environments or preferences.

While these projections were originally considered by some to be little more than science fiction, sufficient R&D progress has already been made in the relatively few years since to considerably temper such dismissive inclinations. Though certainly still contentious in some quarters, if Mr. Drexler is correct in asserting about a nanotechnology based on universal assemblers, “their emergence seems almost inevitable”¹¹, the economic implications command our attention by virtue of a unique threat to the labor-productivity paradigm. However contentious technically in the short term, prudence and humility about the limits of our current state of knowledge at the

¹¹ K. Eric Drexler, *ENGINES OF CREATION: THE COMING ERA OF NANOTECHNOLOGY*, pg. 20.

interface of the numerous relevant disciplines would dictate that we resist being too cavalier in prematurely pronouncing impossibility.

From our standpoint, however, such productive capabilities should, in principle, sound strikingly familiar. Indeed, to a Binary economist they would have precisely such a ring of familiarity; they would, in fact, be a clear, if extreme, instantiation of the Binary principle of the independent productiveness of capital. They also allow us to introduce the speculative concept of an infinite-productivity horizon and further allow us to inquire into what implications such a horizon would illuminate for an economic system whose wealth distribution mechanism is almost completely dependent on labor, and whose productivity-based theoretical rationale for justifying this dependence excludes consideration of *independent* capital productiveness. Such a horizon may ultimately be vastly more relevant and significant to the future of Capitalism than what is currently laboristically anticipated of the “information economy”.

In introducing the idea of an “infinite-productivity horizon”, we will provide a limited example from the Binary literature. This example, originally voiced with *irony*, was meant as a challenge and source of heightened relief to the distinction between the limits of the traditional productivity proposition and the advantages of the Binary productiveness concept. Parenthetically, it is worth noting that the utter inability of the traditional productivity paradigm to provide a self-consistently meaningful distributional characterization of such scenarios should be a strong hint as to their relative conceptual and theoretical merits. With this example in mind, however ironically or facetiously intended by Professor Ashford originally, we propose that the increasingly plausible prospect of the eventual realization of a nanoassembler production capability, compels us to entertain the concept of an “infinite productivity horizon” not at all ironically.

“Consider now the example of a company that owns a building with ten manual elevators and employs ten elevator operators to run them. . . . On a trial basis, the company replaces five of the ten manual elevators with automatic elevators . . . The productivity of those who are discharged has fallen to zero *with respect to their former job*, (my emphasis) although they are functionally no different in their capabilities and have the same potential productivity as those still on the job. . . . To press the example further, in the following year, the remaining manual elevators are replaced by another five automatic elevators. With the operator hours now decreased to zero, should one conclude that the productivity of the operators, now on the unemployment or welfare rolls, has become infinite? (106) The value of the fraction output/input becomes infinitely large as the denominator becomes infinitely small (i.e., approaches zero). In terms of calculus used to describe marginal productivity: $\lim_{I \rightarrow 0} F(o/I) = \text{infinity}$, as I approaches zero.”¹²

As long as we could rely on technological advancements being sufficiently incremental and paced so that pockets of such eruptions of “infinite productivity” were limited to a production function here and a production function there, sparsely scattered through a generally expanding larger economy that would reabsorb the displaced labor, in a process that we could hope would reliably repeat itself ad infinitum, our complacency could remain intact; under no apparent threat, content that there was not something more significant to consider; content that there was not some deeper principle – precisely such

¹² From, pgs. 26/27, THE BINARY ECONOMICS OF LOUIS KELSO: THE PROMISE OF UNIVERSAL CAPITALISM. Rutgers Law Journal Vol. 23, #1, Fall 1990. By Professor Robert H.A. Ashford.

as Binary productiveness – to be seriously considered and oblivious of what the implications might be if the productivity “ran out”.

The prospect of nanoassembler-based nanotechnology gives us an exciting glimpse of something that ought to also give us a *very* serious moment of economic pause by revealing a threat to the complacency of these assumptions. It raises the prospect, *not* of gradual, incremental, sparsely scattered outbursts of “infinite productivity”; it raises the prospect of a quantum leap, an event horizon. In fact, it raises the prospect of an “infinite productivity horizon” with respect to material production generally, and, when coupled to much more potent Artificial Intelligence, perhaps considerably more than *just* material production. This, in turn, makes the continued denial of the Binary principle of the independent productiveness of capital seem increasingly strained, if not downright obstinate and ludicrous. In effect, “Although conventional economics promises most people greater market participation in production *only* (emphasis in original) by way of higher productivity, binary logic shows that, as capital productiveness replaces labor productiveness and greatly adds to total productiveness, *it inevitably concentrates any higher human productivity into relatively fewer workers per unit of production.*” (my emphasis)¹³ takes on its fullest possible significance when capital productiveness completely supercedes labor *not* in a locally isolated production function, but categorically, as in such nanotechnology. It puts less categorical productiveness on steroids, with the most dire systemic implications. Specifically, any economic system that relies almost exclusively, as do virtually all forms of extant capitalism, either controlled or unregulated, Turbo-capitalism, on the laboristic productivity proposition for its core theoretical characterization of production, and then thereby rationalizes an equally almost exclusive social reliance on labor for its mechanism for the distribution of wealth, will find itself at a sudden, critical and *very* unforgiving systemic inflection point. Hence the cautionary choice of epigrams introducing this essay.

Finally, it is important to re-emphasize that what adds even more social urgency to the visionary prospect of such awesome productive capability is recognition that the very same technologies will have, in fact are already beginning to have, similarly powerful effects in the field of computer technology that will allow for their coupling with Artificial Intelligence far beyond our current capabilities. This will enable the coupling of unprecedented design plasticity to an unprecedented productive capability, allowing for the prospect, mentioned earlier, of either autonomous adaptability or customer self-customization of a sophistication only barely hinted at with today’s digital technology. We would be well advised to consider Mr. Drexler closely when he says: “Assemblers will be able to make virtually anything from common materials *without labor* (emphasis mine) . . . they will transform technology and the economy at their roots . . .”¹⁴, and also, “Consider the force of this situation: under development will be the greatest production tool in history, a truly general fabrication system able to make anything that can be designed . . .”¹⁵ In light of the emergence of the self-limiting constraints of decision-making costs and temporal limitation already mentioned, which strongly suggests that reliance on ever greater educational attainment for assuring some

¹³ From, pg.207, BINARY ECONOMICS:THE NEW PARADIGM by Robert Ashford & Rodney Shakespeare.

¹⁴ K. Eric Drexler, ENGINES OF CREATION:THE COMING ERA OF NANOTECHNOLOGY, pg. 63.

¹⁵ Ibid. pg. 50.

hoped-for, endless monetization of “knowledge production”, per se, and, thus, universal economic viability for a purely labor-based wealth distribution mechanism, is highly problematic, technology of this level of independent productiveness renders the assumption that the existing productivity paradigm is theoretically remotely sufficient, even more of a laboristic phantom and tends to lend very substantial basis for considering the possibility that there may well be a near historical inevitability to the ultimate vindication and adoption of the Binary principles of productiveness and systemic prescriptions for universalizing ownership of capital.