

Migration, Innovation and Exploitation in the Chinese Knowledge Economy:
'Immaterial Labour' and Consumer Electronics Manufacturing

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*The world is undergoing a knowledge revolution, unique in the speed and pervasiveness of change...China cannot afford to miss this.*¹

*As rural migrants, Foxconn workers enjoy little labor protection in society at large and suffer from heightened work pressure and desperation in the workplace that lead to suicides and to daily and collective resistance.*²

The ‘knowledge revolution’ has determined key destinations of Asian migration. The ascendance of this economic paradigm has received important scholarly attention in a diversity of critiques of the cybernetic, cognitive, and informational extensions of contemporary capitalism.³ Such theorizations herald the emancipatory potential of information and communication technologies (ICT). Yet they tend to intersect curiously with applied discourses of the ‘knowledge economy’ exemplified in the market-driven imperative seen above. In their parallel conceptualizations of ‘immaterial labour,’ both kinds of discourse tend to make absent the very condition of possibility of immaterial labour itself - the *material* labour of migrant workers in China’s electronics industry.

This essay attempts to analytically juxtapose key features of ‘immaterial’ and ‘material’ labour in the context of the electronics industry. Consumer electronics represent a singular ‘hard commodity,’ unparalleled in their significance to the ‘globalized informational regime.’ The electronics industry is hence the site of the knowledge economy’s material labours. This essay suggests that surplus-value extraction is effected differently between immaterial and material labour in the Chinese knowledge economy. Whereas ‘innovation’ is the value-generating capacity integral to immaterial labour, ‘exploitation’ is the mode of value production proper to electronics manufacturing.

This essay comprises five sections: the first offers conceptual clarification of ‘immaterial

¹ Dahlman, Carl J., and Jean-Eric Aubert. *China and the Knowledge Economy: Seizing the 21st Century*. World Bank (2001), pp. 3

² Pun, Ngai, and Jenny Chan. “The Spatial Politics of Labor in China.” *South Atlantic Quarterly*. 112.1 (2013) pp. 187

³ Bulut, Ergin, Rodrigo Britez, and Michael A. Peters. "Cybernetic Capitalism, Informationalism, and Cognitive Labor." *Geopolitics, History, and International Relations* 1.2 (2009), pp.16

labour’ focusing on themes of governance and innovation. The second does the same for ‘material labour’ by summarizing key investigative reports into exploitative working conditions in China’s electronics industry. The next three sections illustrate key sites for the value-differentiating of material and immaterial labour: ‘development,’ the ‘spatialization of innovation,’ and the ‘biopolitics’ of value assignment. Throughout, it is demonstrated that the very possibility of conceptualizing ‘immaterial labour’ is the exploitation integral in the material labour of electronics production.

Immaterial Labour: Governance and Innovation in China’s Knowledge-Economy

This section attempts to clarify and synthesize key concepts that define ‘immaterial labour.’ This section contends that conceptualizations of *governance* are deeply embedded in the defining problematics of immaterial labour. In the case of China, emergent forms of neoliberal governance are especially important to the task of making what we could call a ‘knowledge workforce.’ But governance in this case must be applied to certain capital-circulating and value-generating activities. Here, ‘innovation’ figures as the mode of surplus-value creation proper to immaterial labour. At the level of conceptualizing ‘immaterial labour’ alone, governance and innovation combine to produce a value differential wherein immaterial labour is ascribed a much greater value-generating capacity than material labour.

To proceed, it may be necessary to unpack a number of related concepts before bundling them back up within the aggregate conceptual concept of ‘immaterial labour.’ These concepts are: the knowledge economy, creative industry, and cognitive capitalism. To begin, ‘immaterial labour’ is associated with Maurizio Lazzaratto’s seminal article of the same name. Lazzaratto analyzed the import of ‘cybernetic’ information technologies on commodity production. Importantly, Lazzaratto was less concerned with commodity production in the sense of material

manufacturing than he was with the “informational and cultural content of the commodity.”⁴ This conceptualization was borne out in subsequent theorizations of the affective and symbolic registers of commodity production and *value creation* more generally in contemporary capitalism.⁵ This value-producing capacity can help explain why the immaterial concept of ‘knowledge’ is so important to management, marketing, economic and development sciences. But this rests peculiarly with Lazzarato’s optimism about the discretely anti-capitalist potentiality of immaterial labour, specifically the cooperative vocation of knowledge work which poses “a problem of legitimacy for the capitalist appropriation of its [production] process.”⁶ Discourses of immaterial labour have accordingly borne out a remarkable convergence of antagonistic ideological positions in terms of attitudes towards capitalism’s turn to information and communication technologies (ICT) and immateriality. As we shall see, what they may also have in common is their invisibilizing of exploitative labour in producing ICT itself.

The World Bank’s *China’s Transition to a Knowledge Economy* is a remarkable source of institutional thinking on immaterial labour in China. The authors’ position may be succinctly conveyed as an aspiration for China to massively invest in the “intangible assets [of] education, training, research, development, software, branding, marketing, and distribution.”⁷ It should be noted here that the ‘intangible assets’ animating these professions are not static bodies of technique. Rather, they are so many forms of ‘knowledge’ in a neoliberal register: healthcare and real estate alike offer opportunities for entrepreneurial innovators to challenge, adapt, and exponentially increase existing knowledge. In other words, these services are venues in which

⁴ Lazzarato, Maurizio. “Immaterial Labour.” *Generation Online*

⁵ See Martin-Cabrea, Luis. “The Potentiality of the Commons: A Materialist Critique of Cognitive Capitalism from the Cybracer@s to the Ley Sinde.” *Hispanic Review*. (2012): 583-605

⁶ Lazzarato

⁷ Dahlman, Carl J., and Jean-Eric Aubert. *China and the Knowledge Economy: Seizing the 21st Century*. (2001), pp. 34.

innovation realizes the surplus-value capacity of knowledge in commercializable form, with skilled workers effecting this innovation.

Creative industries link innovation and the knowledge economy to urbanism. Theorists of creative industries tend to prize the urban inputs of the knowledge economy, what Yusuf and Nabeshima call the city's "value-creating attributes."⁸ These attributes - including urban amenities, green-space, high-speed internet, night-life, and an affluent consumer base - are found in cities that house substantially diversified industrial and service sectors. Hence for these scholars creative industries in Asia are closely linked to the urban service industries of financial, legal, marketing, and accounting services. For Yusuf and Nabeshima the creative industries themselves consist of "IT-intensive activities such as design, publishing, multimedia, software development, video entertainment and movie making."⁹ The Chinese government's *Statistical Yearbook* shows a similar confluence of creative and urban service industries: the category 'service industries' there is comprised of "information transmission, software and information technology service, leasing and business services...culture, sports and entertainment."¹⁰ In the space of the city, filmmaking and stock-trading find conceptual and practical connections through their common reliance on knowledge and 'creative' capacities.

All of this begs the question of how rural migrant workers factor into the 'value-creating attributes' of the city in China. Crucially, the above scholars make the link between creative industries - R&D in particular - and 'material labour' in manufacturing. They state: "The creative industries...require a well-developed ICT infrastructure to serve their clientele, and interaction

⁸ Yusuf, Shahid, and Kaoru Nabeshima. "Creative Industries in East Asia." *Cities* 22.2 (2005) pp. 115

⁹ *Ibid.*, 110

¹⁰ 'Science and Technology.' In National Bureau of Statistics, China. *China Statistical Yearbook 2014*. China Statistics Press, 2014. <<http://www.stats.gov.cn/tjsj/ndsj/2014/indexeh.htm>>.

with an IT manufacturing base to create and target their products.”¹¹ What is noteworthy here is that the relationship between design and manufacturing is one of an ambiguous ‘interaction’ - itself enabled by ICT - that does not necessarily designate the spatial or social proximity of the worlds of material manufacturing and immaterial design. And while manufacturing is resolutely urban, creative cities require a particular kind of urban spatiality, sociality and industry against industrial sites. This ‘creative urbanness’ is deeply invested with an idea of innovation as the generator of value in the knowledge economy; a value differential is here introduced between ‘creative’ and ‘industrial’ cities, resolutely locating ‘unskilled’ migrant workers in the latter.

Yusuf and Nabeshima’s emphasis on urban creative innovation echoes the developmentalist literature of the World Bank. A 2007 World Bank working paper infuses ‘innovation’ with a boldly competitive inflection. Also titled *China’s Transition to a Knowledge Economy*, the report sees economists Zeng and Wang envision China’s transformation from a ‘manufacturing superpower’ to an ‘innovation superpower.’¹² Two implications are of note here. The first is the significance of ‘innovation.’ Innovation is presented as a necessary ‘next step’ from manufacturing for a Chinese economy attempting to ‘catch up’ with innovation powerhouses in the Global North. Once again, the spotlight is placed on the greater value-generating capacity of immaterial innovation over material manufacturing. Innovation accordingly becomes the specifically *informational* means of producing and measuring surplus value in knowledge, comprising as it does the manipulation and ‘super-adequation’¹³ of existing knowledges and techniques. Again, conceptualizations of ‘innovation’

¹¹ Yusuf & Nabeshima, 113

¹² Zeng, Douglas Zihua, and Shuilin Wang. *China and the Knowledge Economy : Challenges and Opportunities.*, 2007 (World Bank eLibrary Policy Research Working Papers), pp. 26

¹³ For more on ‘super-adequation’ see Spivak, Gayatri Chakravorty. “Scattered Speculations on the Question of Value.” From *In Other Worlds: Essays in Cultural Politics*. Methuen: New York, 1987.

house a value differential that positively marks immaterial labour against material labour, and manufacturing in particular.

The second implication of note is the role of neoliberalized state governance in bottom-lining China's 'informational' transition. Like Yusuf and Nabeshima, Zeng and Wang expound the existential significance of state-secured Intellectual Property Rights (IPR) institutions for the knowledge economy. Elsewhere Ramesh Sangarlingam states: "the effective use of technology within the framework of a national innovative system depends upon two factors:...the flexibility of labour to adapt to new technology, and intellectual property rights."¹⁴ Governance is implicated in the need for adequate institutional support for labour flexibility. In much of the literature this invariably means training and educational initiatives on the part of joint state-corporate ventures,¹⁵ commercialized in the form of the 'national innovation system' where Ramesh couches his argument. National innovation systems are well-entrenched in the World Bank literature. They represent the unique 'hybridity' of value-production in the context of globalized cognitive capitalism, combining elements of neo-nationalist and neoliberal developmentalism; the enmeshing of the firm and the university; and the increasing role of FDI's in transmitting venture and finance capital for knowledge initiatives.

Again, IPR is presented as a condition of innovation, particularly in the form of commercializable R&D. R&D is a principal agent of Chinese 'knowledge development,' as seen in the staggering 204% increase in R&D expenditure in China between the years 2009 and 2013.¹⁶ Crucially, IPR functions as a juridical grid for R&D, the national innovation system, and the whole of the knowledge economy. Governance is accordingly necessary to secure profitable

¹⁴ Ramesh, Sangaralingam. "China's Transition to a Knowledge Economy." *Journal of the Knowledge Economy* 4.4 (2013), pp. 483

¹⁵ Zeng & Wang, 21

¹⁶ "Science & Technology." *China Statistical Yearbook 2014*

returns on technological and knowledge developments. Dahlman and Aubert assert that “to get the greatest return on [knowledge investments], China must also upgrade its economic and institutional regime - which includes changing the role of government.”¹⁷ Bruton *et. al* similarly claim that business formality, secured through private and intellectual property rights, is necessary for successful entrepreneurship in the context of knowledge-led development in East Asia.¹⁸ Hence, the role of the Chinese government must undergo a significant transformation in order to adapt to the new knowledge climate.

But ‘labour flexibility’ for Ramesh and others means more than adaptability to technology. Labour flexibility of knowledge workers is integrally bound to mobility and migration. For Ramesh this means the mobility of a transnational class of Chinese knowledge workers who are inherently better-positioned to ‘innovate.’ In Ramesh’s assessment, labour flexibility for skilled workers takes on a particular tone of classed migration, one which includes a latent critique of China’s purported cultural resistance to change in the area of ‘creativity,’ seen elsewhere.¹⁹ Circular-migrating Chinese knowledge workers, conceptualized here and elsewhere as the bearer of human capital, become the bodily locus of developmental strategies, of the transnational movement of knowledge and expertise. All of the preceding analyses serve as so many attempts to imagine the further neoliberalization of Chinese governance and society. And they tend to do so within imaginaries of modernization via China’s competitive participation in the highest-value sectors of the global economy. Ultimately, these analyses configure mobile knowledge workers, exercising the value-generating modality of *innovation*, as the space on

¹⁷ Dahlman & Aubert, 4

¹⁸ Bruton, Garry D., and David Ahlstrom, and Steven Si. “Entrepreneurship, Poverty, and Asia: Moving Beyond Subsistence Entrepreneurship.” *Asia Pacific Journal of Management*, 32:1 (2015), pp. 11

¹⁹ See Tung & Wan, 2007

which economic imaginaries of modernization and development play out. The production of the physical ICT infrastructure is ascribed secondary or ‘lower tier’ value status.

Against these appraisals stands the body of critique that we could tenuously categorize as ‘cognitive capitalism.’ The concept emerged from Marxian attempts to grapple with the ascendance of cybernetics and ICT in conditioning the increasingly globalized accumulation and circulation of capital. As the term ‘cognitive’ suggests, the concept encompasses the distinctly affective resonances of contemporary capitalism, particularly with respect to how technology interfaces with subjective consciousness in labour.²⁰ Discourses of cognitive capitalism bare the distinct tendency to configure *domination* as the constitutive violence proper to contemporary capitalism.²¹ Conversely, such theorists locate the germ of capitalism’s subversion within the diffusion of technologically-mediated knowledge and aesthetics production.

Gayatri Spivak’s challenging “Scattered Speculations on the Question of Value” represents a necessary corollary to the optimism and myopic technologism of some theorists of cognitive capitalism. She tends explicitly to the ‘affective’ registers of contemporary capitalism, writing: “if a view of *affectively* necessary labor...as *labor* as such is proposed without careful attention to the international division of labor, its fate may be a mere political avant-gardism.”²² Her critique is predicated on a constant reference to the materialist ‘shifting lines of the international division of labor.’ In so doing she confronts a tendency to consider contemporary subjectivity according to the idiom of ‘freedom,’ itself enabled by the ‘super-adequation of labour power’ effected by ICT. In other words, she opposes the understanding of subjectivity that centralizes human ‘consciousness,’ whereby ICT could allow, through various cognitive and

²⁰ See Bulut, Ergin, Rodrigo Brites, and Michael A. Peters. "Cybernetic Capitalism, Informationalism, and Cognitive Labor." *Geopolitics, History, and International Relations* 1.2 (2009): 11-40.

²¹ See Dona Haraway’s conceptualization of the ‘informatics of domination’

²² Spivak, 162

affective channels, the subject to transcend the capitalist production and appropriation of their bodily labour power.

But to affix contemporary subjectivity to the division of labor means destabilizing such super-adequation, locating subjectivity instead in the production of an exploitatively-produced value differential. Accordingly:

*The 'freeing' of the subject as super-adequation in labor-power entails an absence of extra-economic coercion. Because a positivist vision can only recognize the latter, that is to say, domination, within post-industrial cultures like the U.S., telecommunication seems to bring nothing but the promise of infinite liberty for the subject. Economic coercion as exploitation is hidden from sight in 'the rest of the world.'*²³

Exploitation is indeed hidden from sight. Two recent studies are relevant attempts to address this. Luis Martin-Cabrera describes a highly raced and gendered paradigm of international role-assignment within a continuum of 'material' labour in industry and other tactile labour, and 'immaterial' labor in 'creative industries' and financial capitalism.²⁴ Seth Perlow writes about 'gestural discipline' - repetitive body movements - as a way to connect electronics factory work to media studies and its excitement about the 'gestural' possibilities of touchscreen interfaces.²⁵

Ultimately, consumer electronics are singular products of material labour in that they function as the existential conduits of immaterial labour. As we shall now see, the 'infinite liberty' residing somewhere in immaterial labour is only thinkable through the distinct matrix of material and corporeal exploitation. Following Spivak's emphasis on exploitation, the following section will seek to highlight the system-founding exploitations that allow the electronics industry to interface as it does with 'immaterial labour.'

Exploitation & Material Labour in the Chinese Electronics Industry

²³ Ibid, 167

²⁴ Martin-Cabrera, Luis. "The Potentiality of the Commons: A Materialist Critique of Cognitive Capitalism from the Cybracer@s to the Ley Sinde." *Hispanic Review*. (2012): 583-605

²⁵ Perlow, Seth. "On Production for Digital Culture: iPhone Girl, Electronics Assembly, and the Material Forms of Aspiration." *Convergence* 17.3 (2011): 245-69.

The primary purpose of this section is to identify the most common forms of exploitation in the electronics manufacturing industry from available secondary sources.²⁶ The secondary sources here are generally comprised of undercover and investigative reporting. They include Hong Kong-based labour organizations and EU state-backed consumer watchdogs. Historically, the electronics industry has faced public scrutiny since the early 1980's.²⁷ As Gale Raj-Reichert finds, a 2004 report by the Catholic Agency for Overseas Development served as a catalyst for the industry's establishment that year of the Electronics Industry Code of Conduct (EICC) administered by the corporate consortium Electronics Industry Citizenship Coalition (Also EICC). Perhaps unsurprisingly, much of the impetus here was from firms becoming "aware of the [report's] damaging effects...on firm reputations."²⁸ Raj-Reichert is only cautiously optimistic about the EICC, and elsewhere it is dismissed as essentially ineffectual.²⁹

One excerpt from Electronics Watch's 2014 *Winds of Change* report is worth quoting at length, as it summarizes the findings of so many investigative reports:

*"Due to extensive competition based on cheap labour, the electronics industry is riddled with labour rights violations. Company audits, academic literature and civil society organisations all suggest that the labour rights violations are not specific to single brands, but rather characterise the electronics industry as a whole. No brand can claim to have socially sustainable working conditions throughout its supply chain."*³⁰

Electronics Watch acknowledges here the role played by labour-value differentials in creating systemic conditions of exploitation in the electronics industry as a whole. This analysis may be applied to the growing body of investigative reports into the electronics industry.

²⁶ Other questions which would be important for later empirical research include: *Where* are these abuses concentrated regionally? Are there particular firms that are especially implicated in this abuse? How have forms of exploitation changed over time, and are such changes indexed to economic or technological developments?

²⁷ Raj-Reichert, Gale. "The Electronics Industry Code of Conduct: Private governance in a competitive and contested global production network." *Competition and Change*, 15:3 (2011), pp. 220

²⁸ *Ibid.*, 226

²⁹ See Nadvi, Khalid and Gale Raj-Reichert. "Governing Health and Safety at Lower Tiers of the Computer Industry Global Value Chain." *Regulation and Governance* (2015)

³⁰ Electronics Watch Consortium, *Winds of Change* (2014), pp. 4

The forms of exploitation are diverse and interlocking. Yet they are repeated again and again across electronics manufacturing facilities. It may be most impactful to simply lay bare these abuses with minimal analysis. Placing them side by side dramatically illustrates the breadth of abuses that make information and communications technology possible. The following are labour abuses shared among at least four of the reports considered:

Mandatory overtime; poor food; mixing of day with night workers in dormitories, often making it impossible to sleep; extended and irregular probationary periods; withholding of labour contracts; abysmal lack of training, including ‘formalities’ like signing off on training when there was none; spectacularly unsanitary and cramped dormitories; unreasonable fees and deductions from pay, including excessive fees for transportation from dorms, illegal fees for health checks (the results of which are often withheld), and fees to use the shower; workweeks that do not have requisite rest days; irregular or denied breaks, to the extent that breaks often become ‘the exception to the rule;’ union-busting activities, criminalization of unionization, and lack of any substantive or formal grievance mechanism; militant and excessive factory discipline, including public humiliations and shaming, verbal abuse, and constant monitoring; inability to provide notice on leaving, meaning that final pay is withheld; hiring discrimination, barring ethnic minorities, women, people with tattoos; and child labour, especially in the form of dubious ‘internships’³¹

Taken as a whole, these reports point to the profound irony of material labour on ICT: exploitation is explained precisely in terms of (a lack of) ‘information’ and ‘communication.’ With respect to unyielded back-pay, Hong Kong-based SACOM group concludes “no matter the reasons that triggered these cases ... *miscommunication* is critical between management and the front-line workers.”³² Elsewhere, workers seem to universally lack effective grievance

³¹ SOURCES: China Labor Watch. “Two Years of Broken Promises: Investigative Report of Catcher Electronics Co., Ltd (Suqian), an Apple Parts Manufacturer.” *China Labor Watch*, 2014. <http://www.chinalaborwatch.org/upfile/2014_09_04/2014.09.02_Suqian_Catcher_FINAL_PDF_UPDATE.pdf>; DanWatch and SACOM. “Winds of Change: Public Procurement’s Potential for Improving Labour Conditions in the Global Electronics Industry.” *Electronics Watch Consortium*. 2014 <http://electronicswatch.org/en/publications_830>; Nimbalkar, Gershon, and Claire Cremen, Yolande Kyngdon and Haley Wrinkle. “The Truth Behind the Barcode: Electronics Industry Trends.” *Free2Work* 2014. <<http://www.free2work.org/trends/electronics/>>; Students & Scholars Against Corporate Misbehavior (SACOM). “The Lives of iSlaves: Report on Working Conditions at Apple Supplier Pegatron.” 2014. <<http://sacom.hk/wp-content/uploads/2014/09/SACOM-The-Lives-of-iSlaves-Pegatron-20140918.pdf>>; China Labor Watch. “iExploitation: Apple’s Supplier Jabil Circuit Exploits Workers to Meet iPhone 6 Demands.” *China Labor Watch*, 2014. <http://www.chinalaborwatch.org/upfile/2014_09_25/2014.09.25%20iExploitation%20at%20Jabil%20Wuxi%20EN.pdf>.

³² SACOM, 17

mechanisms; they are incapable of communicating meaningfully or constructively with management. This occurs in a climate of an ineffective ACTFU and a total absence of collective bargaining power - again, an absence of effective communication along and within the supply-chain.

Information is perhaps even more egregiously absent in corporate ‘global value chain’ governance. Brand Firms in the electronics industry systemically lack usable information about suppliers, including information on suppliers with whom they are in direct contact. A 2014 Free2Work report finds it a salutary development that of the 39 companies assessed, 49% have discovered their suppliers for final stage production; 26% have done so for components manufacturing; and 18% have completed partial tracing for mineral extraction for component parts, only doing so because of consumer concerns over conflict minerals from the DRC.³³ While a comparatively favourable third-party review, many of the dubious industry achievements that it flags are simply minor improvements from previous investigations.

Elsewhere, these documents point to the irregularity of communications and information about working conditions specifically through auditing. The corporate self-governance model prevails in matters of auditing and publicization; internal audits and self-reporting are still one of the most valuable sources of information on industry practices.³⁴ For example, much of the highly publicized criticism of Apple supplier Foxconn can be found in Apple’s own internal audits.³⁵ But self-effected auditing seems to be infrequent, institutionally undeveloped, and inadequate. Such auditing is an ineffective channel of information and communication between material labour in manufacturing and immaterial labour in brand firms’ corporate social responsibility departments. Free2Work for example found that of the 39 suppliers considered,

³³ Nimbalker, et. al, 21

³⁴ Nimbalker, et.al, 11

³⁵ <https://www.apple.com/supplier-responsibility/pdf/Apple_SR_2012_Progress_Report.pdf>

15% of them ‘regularly’ audit at least $\frac{3}{4}$ of their final manufacturing suppliers; 3% audit at least $\frac{3}{4}$ of their smelting/component suppliers; and none of them audit for mineral extraction (Pointing to the dire paucity of information on environmental and labour conditions in the material supply of electronics manufacture.) Notably only 24% of the companies audit suppliers unannounced or with off-site worker interviews.³⁶

This suggests that auditing, especially unannounced auditing and opportunities for interactions uncurated by management, is *quantitatively* lacking, to say the least. This comes in addition to reports of qualitative informational, communicational, and enforcement lack in supply chain auditing. Ultimately these reports describe a negative ‘doubling’ of the emancipatory world of instantaneous information-communication envisioned by developmental economists, the World Bank, and (critical) technology theorists. Concentrating on audits, these investigative reports critically identify and name the irregular and constrained channels of communication and information that connect high-value immaterial labour and the so-called ‘lower value tiers’ of the electronics industry.

But it is market signals that provide perhaps the most stunning displays of how of information and communication metabolize into migrant worker exploitation. Virtually all of these reports single out the Just-In-Time and zero inventory models of production. Rises in consumer demand are almost instantaneously metabolized into migrant workers’ bodies through unmanageable and unreasonable production quotas, hyper-intensified labour, and militant factory discipline. The fairly simple schema is: knowledge workers design new electronics products; marketers and advertisers in creative industries spectacularize and mobilize desire for these products; ICT is used to accurately predict and analyze consumer demand data; production quotas are instantaneously transmitted to suppliers by the brand firm; and the suppliers’ flexible

³⁶ Nimbalkar, et. al, 26

workforce is adapted as quickly as possible to new product manufacturing processes and quantities. Herein lies a transmutation of firms' globalized market management into dehumanizing exploitations. And without the latter, the whole of the global informational apparatus would be unthinkable.

The concept of 'peak season' is illustrative. Peak season, sometimes coupled with 'ramp-ups,'³⁷ refers to times when production suddenly mounts, as around holidays or the launch of a new product. These 'compressed temporalities of production' mean accelerating and intensifying the abuses listed above. Peak seasons involve numerous new hires climbing steep learning curves, as many new workers are needed to use unfamiliar machinery to build products that have not been built before.³⁸ To provide some context about the scale of new hires involved, 200 to 800 people per day were hired at Catcher Technology in Suqian when the launch of the iPhone 6 was announced.³⁹ New and old workers alike are subjected to extended mandatory overtime, the removal of rest days, and general conditions of labour extremity. Militant discipline is deployed to countervail the tendencies for waste, error, defect, and inefficiency that characterize the labour of new and untrained workers in peak seasons and ramp-ups. Flexibility in peak season generally means that workers are suddenly switched from day to night shifts, relocated with little warning between dorms and factories, and denied rest, a tendency that SACOM observed when workers at one plant went over ten weeks without a day off.⁴⁰

The current production regime permits no rest precisely because technological innovation, market demand, and industrial manufacturing are conjoined through the instantaneity of the knowledge economy. As we have seen, exploitation is the necessary condition of

³⁷ Ibid, 2

³⁸ Harris, 4

³⁹ China Labor Watch, "Catcher..", pp.10

⁴⁰ SACOM, 2

innovation. It is germane to return to the theme of immaterial labour, to see how discourses of ‘development’ produce the value differential between prized knowledge workers and the rural migrants who who make ‘knowledge work’ possible.

Development and Historicism

‘Development’ resides in any assessment of ‘immaterial labour.’ Hardt & Negri, for example, begin their discussion of post-modern production with the claim that a ‘succession of economic paradigms’ has proceeded through three epochal moments, with the contemporary paradigm characterized by the dominance of services and information sectors via a process of generalized *informatization*.⁴¹ Economists An-Chi Tung and Henry Wan Jr. likewise open their recent essay on the historical emergence of the regional economics industry in Pacific Asia with the observation that in terms of surplus value creation, “the Age of Coal provided substitution for brawn; the Era of Silicon now yields the complement for the brain.”⁴² The inherent assumption of ‘development’ is that *brain* - knowledge economy - supercedes its antecedents in *brawn* - industrial capitalism - with exponentially greater surplus-value potentiality. What the developmentalist perspective ignores is that exploitative material labour in manufacturing is not a temporal stage preceding advanced immaterial economies. Rather, such exploitation is the very condition of producing and sustaining immaterial labour as such.

Importantly, the historical particularity of the current ‘cybernetic moment’ is not immune to triumphalist market readings. Tung and Wan for their part link the emergence of the electronics manufacturing industry in south China to the decline of centralized planning therein, a historical moment that “made bare the limitations of central planning, as opposed to

⁴¹ Hardt, Michael and Antonio Negri. *Empire*. (Cambridge, MA: Harvard University Press, 2000) pp. 280

⁴² Tung & Wan, 446

decentralized market-based decisions.”⁴³ Conversely, for critical theorists the ‘Era of Silicon’ may be read as an epoch of capitalism’s auto-generated overcoming. As Martin-Cabrera notes, there is a latent ‘de-radicalizing’ tendency in this mode of thinking, if exploitative manufacturing processes are not taken into account. Bulut *et. al* suggest as much when they frame their investigation as a question of “whether capitalism can promote forms of social, ecological and economic sustainability.”⁴⁴ Much of the ambiguity of their critique can be located in the relative absence of exploitation in their analysis.

But whether market-triumphalist or prefiguring the internally narrated overthrow of capitalism, the ‘development’ frame is necessarily a part of all discourse on immaterial labour. It is simply impossible to analyze ‘capitalism today’ without confronting development as both an epistemology and an applied body of knowledge and practice.⁴⁵ How then to make sense of China’s heterogeneous modes of industrial activity - from advanced R&D to subsistence agriculture - without resorting to reductive historicism or the absurd claim that China ‘inhabits multiple centuries’ simultaneously? How do we make sense of World Bank economists’ claims that rural migrant sending areas in China are “several centuries behind in their technology and living standards”⁴⁶? Ultimately, it is not a matter of rural China lagging centuries behind the knowledge economy. ‘Rural China’ is rather a key place of origin for those whose distinctly *21st-century* suffering produces the very material possibility of the knowledge economy.

Following Chakrabarty, industrial practice in economic discourse is ‘historicized,’ or affixed to particular time periods. Heavy industry, exploitative labour conditions, place-based tactile knowledges, industrial reliance on a region’s natural resource ‘factor endowment’ - these

⁴³ Tung & Wan, 445

⁴⁴ Bulut, et. al, pp.18

⁴⁵ Chakrabarty, Dipesh. *Provincializing Europe: Postcolonial Thought and Historical Difference*. (Princeton University Press: Princeton, 2000), pp. 29

⁴⁶ Dahlman & Aubert, 43

appear to be proper to an ‘earlier’ form of industrial capitalism. Despite the incessant drive for hyper-innovative industry, some development literature intimates that it may be more expedient for developing economies to pursue ‘less advanced’ industrial forms if there is sufficient need due to abject poverty or other conditions. The latter was the claim of a contribution to the *Asia Pacific Journal of Management*’s special issue on entrepreneurship and development.⁴⁷

Consider this by way of these excerpts from two very different sources:

*On the basic scorecard, China still has a long way to go in fully developing and exploiting its information infrastructure. This is critical because China can leapfrog in development by harnessing the new [information] infrastructure.*⁴⁸

*Production orders were high, and in order to meet demand, the factory was building a new production facility...located on the outskirts of the factory campus. As the building was still under construction, there was iron scaffolding all around it, along with a construction team, crane, and other machinery. A person who did not know better would have assumed that it was a construction site. Garbage was piled up inside the security gate of the facility, and white-coloured water was running along the factory floor.*⁴⁹

When Dahlman and Aubert intone that China may ‘leapfrog in development’ by ‘exploiting’ its information infrastructure, they imply that there are certain redundant stages of development - presumably industrial activity of a ‘pre-informational’ mode - which may be averted with an advanced ICT infrastructure. These are the specific ‘temporalities of industry,’ a sort of hierarchy of industrial modernity. A society’s position therein is indexed to the degree of dependence on ‘knowledge’ vs. industrial reliance on natural resources, place-based knowledges.

The juxtaposition of two kinds of infrastructure in the above excerpts is quite deliberate. One kind of infrastructure is the ethereal world of communication and connectivity, of networked informational pathways. The other is the - literally - concrete infrastructure needed to produce the material implements of ICT. The first gives ‘structure’ and effectivity to China’s ‘national innovation system’ and its knowledge and creative industries more generally. The

⁴⁷ See Alvarez, Sharon A, and Jay B. Barney and Arielle M.B. Newman. “The Poverty Problem and the Industrialization Solution.” *Asia Pacific Journal of Management*. 32:1 (2015) 23-37

⁴⁸ Dahlman & Aubert, 41

⁴⁹ China Labor Watch. “iExploitation...”, 7

second is the efflux of one of the greatest human migrations in history, and is the site of system-founding exploitations unseen in the techno-spectacle of the knowledge economy. As the CLW report cited above suggests, development quite often literally ‘leaves things unfinished,’ including the ceilings of a Jabil circuit facility where tiles collapsed dangerously in the washrooms.⁵⁰ Endless production orders mean that sometimes there is literally not enough *time* to develop industrial infrastructure that puts a solid roof over workers’ heads.

This is the reality of materializing innovation. Knowledge-led development is refracted through the products of the electronics industry. The industry in turn affixes production to the ‘shifting lines of the division of labour,’ pursuing the greatest yield possible on labour. And brand firms that dominate knowledge-production and diffusion demonstrate a patent and systemic incapacity and/or refusal to meaningfully transform production practices. Given all of this, how else can the knowledge economy proceed than through the violent exploitations enumerated above? Is this what management and development theorists have in mind when they write about the growing pains of industrially-led development in East Asia? Why are intolerable working conditions framed as a necessary precondition for industrial development, and not recognized as *essentially* intolerable? And if the whole of East Asia ever ‘caught up,’ ‘where would the factories go?’ This question of ‘where’ suggests the importance of *space* in producing a value-differential between material and immaterial labour according to the exigencies of capital and the ‘shifting lines of the division of labour.’

Spatializing Innovation in the Chinese Knowledge Economy

Spatial differentiation of material and immaterial labour entrenches and increases the exploitative value differential separating these modes of labour. Here development collides with the knowledge economy’s urban vocation. The Chinese state actively produces such spatial

⁵⁰ Ibid, 20

differentiations: consider the importance of Economic and Technological Development Zones (ETDZ), High Tech Industrial Development Zones (HTIDZ), and Science and Technology Research Parks. *China Briefing*, an information review for prospective foreign investors, states that in ETDZ and HTIDZ space, “the convenience of established infrastructure, reserved land and one-stop services... streamlines entry into China.”⁵¹ Indeed, these zones are expansive spatial receptacles of FDIs. But even more-so they materialize the national innovation system described earlier through complex spatio-political assemblages of multinational corporations, state-owned enterprises, universities, and spaces of vastly differentiated labour.

We must unfortunately set aside here the matter of constructing these spaces in the first place, which requires extraordinary levels of migrant ‘material labour’ in construction. Recall the theorists of Chinese creative industries who expounded the value-addedness of green-space, entertainment, night-life, urban cosmopolitanism, and creative cities’ inherent value-generating attributes. The Science and Technology Research Park represents the confluence of such attributes within the incessant engine of commercializable innovation. Even the name ‘park’ evokes the greenery, leisure, and urban pastoralism purportedly privy to those of the creative class. Contrast the ‘park’ with what Pun and Chan have called the ‘Dormitory Labor Regime’⁵² of the electronics industry. This regime instantiates a “total system of daily management”⁵³ with factory-disciplined regulation of sleep-times, bathroom use, nourishment, and hygiene in dehumanizing dormitories. Workers essentially *never stop working*. Whereas the ‘park regime’ aspires to inculcate in knowledge workers a liberal and spontaneous innovation-capacity, the

⁵¹ <<http://www.china-briefing.com/news/2011/10/05/understanding-development-zones-in-china.html#sthash.tjnI8Hkg.dpuf>>.

⁵² Pun, Ngai, and Jenny Chan. “The Spatial Politics of Labor in China.” *South Atlantic Quarterly*. 112.1 (2013) pp. 180

⁵³ *Ibid*, 185

dormitory regime renders work and sleep coterminous, effecting the total industrialization of the life process and reducing the worker to the position of ‘a speck of dust on the shopfloor.’⁵⁴

It is important to note here that the *IT Workers Report* details the specific rural origins of electronics workers. China’s transition to a knowledge economy is accordingly spatialized as what Anthropologist Yan Hairong calls a ‘spectralization of the rural.’⁵⁵ Disavowed, but never superseded, the urban knowledge economy is ‘haunted’ by the unsettling figure of the rural migrant, especially the woman migrant.⁵⁶ This dynamic is partially generated by the process of Primitive Accumulation particular to China, whereby collectively-held lands are partitioned to private owners through state channels.⁵⁷ This has at times paradoxically produced a mass ‘re-proletarianization’ in rural China, generally involving staggering value differentials between Land Use Rights (LURs) yielded from the Chinese state to some buyers and similar rights accorded to rural Chinese.

For the management theorists cited above this is envisioned as an ‘unlocking’ of latent capital; in characteristically neoliberal language, it represents a freeing up of individual economic subjects’ entrepreneurial capacity’ by giving them start-up capital in the form of their own land.⁵⁸ This is indeed often the case. As the *Asia Monitor Resource Center* has found in the case of Shenzhen, a key hub in China’s national innovation system and home to a sprawling HTID: “dispossession of peasants...created a middle class, and expanded the base of the consumer class. These peasants were allotted residential flats in city centers and granted urban

⁵⁴ Ibid

⁵⁵ See Yan, Hairong. "Spectralization of the Rural: Reinterpreting the Labor Mobility of Rural Young Women in Post-Mao China." *American Ethnologist* 30.4 (2003)

⁵⁶ Ibid, 581

⁵⁷ Ibid, 570

⁵⁸ Bruton, et al, 11

hukou registration.”⁵⁹ Far from emancipatory however, authors Leong and Pratap point to the intractable inequality that this arbitrary division of social and spatial advantage has produced.

Knowledge and industrial-led urbanization has thus staged the stratification of rural people: rural migrants from central and Western China are ascribed a different value than rural people whose lands have been ‘innovatively’ developed, or who reside in urban *hukous*. Feng Xu has recently illustrated how this arbitrary capital-empowerment plays out spatially, noting that: “Peasants who live in outskirt areas have ... found a niche market to build on their own land and provide rentals to migrants. But this rental market is not regulated. One often finds migrants living in unsafe and crowded conditions.”⁶⁰ Migrant enclaves serve as counterparts to dormitories, where migrant labourers are precariously concentrated, with as much value extracted from them as possible.

This can be an example of key ‘feedback’ relationships between material and immaterial values. Xu describes the mobilization of immaterial technique and labour in urban governance in the form of *shequ*, the Chinese government’s spatial conception of ‘harmonious community.’ The diversification of Chinese cities due to rural migration has resulted in an accelerating and concentrating of ‘immaterial labour’ in the form of urban services and management. Notably, this results in a gated spatial differentiation of *shequs* according to class, profession, and socioeconomic privilege. As Xu and Ann Anagnost both note, urban governance of migrants also takes the form of dispossession through routinized demolitions of migrant enclaves. Dispossession becomes part of a ‘feedback’ circuit whereby immaterial labour translates into the exploitation of migrant workers. The issue of wages for workers in the electronics industry is another example of this. Wages are doubly problematic in that they are inadequate to begin with,

⁵⁹ 10(161)

⁶⁰ Xu, Feng. “Gated Communities and Migrant Enclaves: The Conundrum for Building ‘Harmonious community/shequ.’” *Journal of Contemporary China* 57:17 (2008), pp. 643

and they do not correspond to rising costs of living in urban industrial areas. China Labour Bulletin recently concluded that “wage increases for China’s lowest paid workers have often been eroded by higher costs of living, and the issue of wage arrears remains a serious and unresolved problem throughout the country.”⁶¹

This suggests that there are concrete relationships between the exploitation of migrant ‘material labourers’ and urbanization within a knowledge-economy framework through the urban cost of living. This analysis is borne out in a broad range of recent empirical studies. The *IT Workers* report observed that Shenzhen had achieved the highest minimum wage in the country in order to attract labour, however this wage differential was essentially consumed by the increasingly unmanageable cost of living.⁶² The AMRC similarly found a positive correlation between rising costs of living and heavy industrialization in Shenzhen, without an attending wage increase. All of this works as incentives for workers to comply with manufacturers’ mandatory overtime regimes. And it speaks to the work of spatializing innovation. Urban workspaces are constructed as differentials between material and immaterial labour. Urban migrant enclaves and electronics facility dormitories serve as negative doubles of creative cities and knowledge parks; here, the value differential necessary to the production of immaterial labour is marked and reproduced in space.

Biopolitics and Labour: Human Capital

In theory as in practice, the value differential between material and immaterial labour is the true engine of the knowledge economy. But what the literature suggests is that there is a profound ‘corporeality’ to this differential. Immaterial and material labour occupy different strata within a bodily economy of knowledge production, one which biopolitically allocates value

⁶¹ <<http://www.clb.org.hk/en/view-resource-centre-content/100206>>.

⁶² Stracke, et. al, 11

accumulation and difference to workers as biological subjects. This section accordingly describes how certain biopolitical concepts produce the value differential between material and immaterial labour. Again, immaterial labour emerges as a concept that is only thinkable due to an exploitative value differential affixed to the division of labour.

It is not coincidental that Michel Foucault's famous study of 'biopolitics' began with lectures on political economy and the emergence of neoliberalism.⁶³ Biopolitics indeed has a long trajectory in critical political economy. Chakrabarty and Spivak for their part trace the critical study of biopolitics to Marx's concept of abstract labour. For Chakrabarty this was necessarily a historical phenomenon; abstract labour as an aspirational concept was bound to the emergence of particular juridical regimes associated with the universal, and by extension with the conventional European liberal subject.⁶⁴ Similarly, Spivak sees in abstract labour the realization of a 'materialist predication of the subject' whereby human subjectivity is understood as the "subject's super-adequation of itself."⁶⁵

But in both Chakrabarty and Spivak's assessments, the logic of capital follows a necessary recourse to biology in order to imagine the 'human' host of abstract labour. In addition to the gendering and racializing of labour-imaginaries - in terms of efficiency, potential for acquisition of skills, natural propensities for certain kinds of labour, etc. - this biological reduction of the figure of the 'worker' asserts that the immediate human conduit of abstract labour is always a biological subject differentially positioned according to a fluid taxonomy of physiological or genetic traits. Capitalism subsequently imbricates its logic into the social construction of these taxonomies, affixing a logic of value creation to social imaginaries of aptitude and efficiency. This is manifested in capital's relationship to race, gender, ability

⁶³ See Foucault, Michel. *The Birth of Biopolitics*

⁶⁴ Chakrabarty, 26

⁶⁵ Spivak, 165

sexuality, age, regionality - all of which may or may not antedate the emergence of capitalism, but which ultimately find themselves mutually constitutive of the capitalist enterprise of ‘making a (knowledge) workforce.’ What is most striking for this analysis then is the staggering differential in biological conditions between material and immaterial labour.

Empirical reports of electronics manufacturing portray the factory space as a kind of sensory assault on the body. They are replete with accounts of inescapable noxious odours, irritating fumes, corrosive liquids splashing into unprotected eyes, the ceaseless clamouring drone of machinery unmitigated by earplugs, and dangerous heat on the shop-floor.⁶⁶ This finds its way into musculoskeletal disorders, depression, chronic fatigue, and frightening threats to women workers’ reproductive health.⁶⁷ Knowledge parks on the other hand are resolutely ‘spaces of the mind.’ Perl’s article may be relevant here: knowledge work, particularly under pressing contracts, surely involves its own ‘gestural discipline’ in the form of sitting and staring at computer screens and tablets, stressful deadlines, etc. But while cognitive capitalism may demand both factory and design work, it differentially assigns value to both kinds of work along lines that are distinctly biological. As elsewhere, we come to see the biological exploitation of migrant ‘material labourers’ as the very condition of possibility of knowledge work.

This is readily grasped in the prevalence of biopolitical ‘Human Capital’ as an operative concept in knowledge economy discourses. Human Capital is perhaps best explicated in this context with the idea of ‘lifelong learning’ and credentialized education. Training and education configure as the necessary self-investments for the biopolitical subject to ‘unleash’ their latent and exploitable innovative capacity. But as Bulut et. al claim: “neoliberal restructuring of schooling in line with market demands has resulted in the emergence of a global policy inflation

⁶⁶ Stracke, 11; SACOM, 8, etc.

⁶⁷ Pun and Chan, 182

around lifelong learning and educational credentials that can be commodified.”⁶⁸ Again and again we are told that the Chinese government needs to help foster the growth of a lifelong learning system in order to competitively access the global knowledge economy.⁶⁹ This is where R&D, informatization, and the development of a national innovation system intersect in the human body. But while ‘lifelong learning’ contains an implicit biopolitical tendency for subject-formation, it is also specifically configured to produce the commodified output of the knowledge worker - commercializable *innovation*.

Accordingly, in knowledge economy discourse, lifelong learning is a value-generating practice and is in large part achieved through institutional partnerships between firms, the state, and the academy. But in practice, such institutional-pedagogical hybridity can have terrifying expressions. On the shopfloor, the ‘student internships’ described earlier indeed represent an exploitative confluence of ‘learning’ and the ‘knowledge economy’ - a perverse example of ‘lifelong learning’ in action. Pun and Chan found that in the case of Foxconn “internships...are collectively organized on a mass scale, with Foxconn, local governments, and schools establishing a triangular relationship.”⁷⁰ Is this not on the surface an example of an educational-innovative network of firms, academic institutions, and government? There is indeed an effort in China as elsewhere to produce some kind of ‘networked’ distribution of governance between state and corporate actors; but in practice this necessarily includes both the national innovation system envisioned by the World Bank, and the seasonal reserve of student workers marshalled by electronic component manufacturers.

There is a tragic irony to the pervasiveness of human capital discourse. Pun and Chan recall the “bright red banner hanging at the new Foxconn facility in Chengdu [that] reads: ‘Heart

⁶⁸ Bulut, et. al, pp. 31

⁶⁹ See Zeng & Wang, pp. 25

⁷⁰ Pun and Chan. pp. 184

to heart, Foxconn and I grow together.”⁷¹ The exploitations meted out in this facility - whose location inland in Chengdu is quite important - give lie to the framework of emancipatory human capital development. A distinctly *bodily* value differential is effected between immaterial knowledge work and the material labour of migrant factory workers.

Conclusion

Critical conceptualizations of immaterial labour intersect with neoliberal discourses of the knowledge economy. Both reproduce a value-differential between material and immaterial labour that ascribes *exploitation* to one and *innovation* to the other. Further empirical study is needed to better understand the productive linkages between global informationalism and contemporary electronics production. Global Value Chain governance has been posited as a structurally ameliorative program of addressing the violence inherent therein. Representing a confluence of consumer activism, state-backed regulation, and brand firm CSR, this form of ‘governance’ ultimately aligns too closely with the neoliberal governance seen earlier in the knowledge economy.

While such approaches have discrete and important merits, they are insufficient on their own, given the dizzyingly complex interconnections between globalized information management, neoliberal governance, World Bank-backed development initiatives, and the capitalist vocation of producing and exploiting value differentials. Migrant labour empowerment is fundamentally necessary, beginning with meaningful solidarity that seeks to undermine the inviolable authority of firm and management. Perhaps this can partially take the form of a critical deployment of ICT towards the specific role of human and nonhuman exploitation in producing immaterial labour. Sleep, creativity, clean air, and *value* must not be the exclusive entitlements of those with the status of ‘innovator.’

⁷¹ Ibid, 183

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