



Development as leapfrogging, not convergence, not catch-up: towards schumpeterian theories of finance and development

Leonardo Burlamaqui & Rainer Kattel

To cite this article: Leonardo Burlamaqui & Rainer Kattel (2016) Development as leapfrogging, not convergence, not catch-up: towards schumpeterian theories of finance and development, Review of Political Economy, 28:2, 270-288, DOI: [10.1080/09538259.2016.1142718](https://doi.org/10.1080/09538259.2016.1142718)

To link to this article: <https://doi.org/10.1080/09538259.2016.1142718>



Published online: 25 Feb 2016.



Submit your article to this journal [↗](#)



Article views: 252



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 2 View citing articles [↗](#)

Development as leapfrogging, not convergence, not catch-up: towards schumpeterian theories of finance and development

Leonardo Burlamaqui^a and Rainer Kattel^b

^aDepartment of Economic Evolution, State University of Rio de Janeiro, Rio de Janeiro, Brazil; ^bRagnar Nurkse School of Innovation and Governance, Tallinn Technology University of Technology, Estonia

ABSTRACT

Our aim is to demarcate a pathway towards Schumpeterian theories of finance and development. To do this, we offer four basic propositions for discussion. First, we suggest that ‘convergence’ and ‘catch-up’ are, from a Schumpeterian perspective, theoretically inadequate concepts as they frame development narratives similarly to the Rostovian idea of a linear path towards some sort of ‘equilibrium imposed on history’. Leapfrogging by means of innovation and finance is put forward as a better approach to analyzing development trajectories. Second, we contend that rather than the often-assumed convergence among nations, history shows that ‘divergence’ is a more common result of development trajectories; this is especially visible in the last half a century. Third, we outline the key features of this Schumpeterian framework, centered on the concept of leapfrogging through innovation and finance. We conclude by highlighting the essential roles of finance and financial governance within this alternative framework for understanding successful development trajectories, and posit that this construct may be labeled a Schumpeterian entrepreneurial state.

ARTICLE HISTORY

Received 6 July 2015

Accepted 21 December 2015

KEYWORDS

Catching-up; convergence; development theory; Schumpeter

JEL CODES:

O1; O33; O38

1. Introduction

This article aims to show that development processes and trajectories are better understood within a Schumpeterian approach than within existing orthodox and heterodox approaches. A key point is that these processes typically lead to *divergence*, rather than convergence or even ‘catch-up’. We proffer that Schumpeterian competition is the linchpin of economic evolution or ‘development’, and that differentiation, not homogenization, is the outcome. In Hirschmanian parlance, this translates into development as an unbalanced growth process (Hirschman 1958; Adelman 2013).¹ In fact, promoting economic development requires very distinctive policy tools—and changing them as the process evolves—as well as continuous institutional reforms. The theoretical backing for this policy perspective is that successful (and rapid) development processes involve leapfrogging rather than a path towards convergence or catching-up. In other words, development

CONTACT Leonardo Burlamaqui  leonardo.burlamaqui@gmail.com

¹See also Kattel et al. (2009) for a discussion of the debate between unbalanced versus balanced growth among early development economists.

is not continuous and orderly, but rather an abrupt and conflict-prone process. Catching-up is therefore not an ‘end state’, but a prelude to either soaring ahead or falling behind.

The article offers four propositions for discussion in this context. First, it argues that, instead of the often-assumed convergence among nations, history shows us that divergence is a more appropriate way to understand development trajectories; this is especially visible in the last half a century. Second, it suggests that ‘convergence’ and ‘catch-up’ are, from a Schumpeterian perspective, theoretically inadequate concepts as they frame development narratives similarly to the Rostovian idea of a linear path towards some sort of ‘development equilibrium’ (the technological frontier). We call this ‘equilibrium imposed on history’. Third, it outlines this Schumpeterian framework, centered on the concept of leapfrogging through innovation and finance,² as a more promising way to address both development theory and the historical trajectories observed since the industrial revolution in Britain. Finally, the article points out that besides credit, macro-financial coherence and ‘robust’, state-led financial governance are essential—but underdeveloped—dimensions of Schumpeter’s framework and should become objects of inquiry for improving it. At that point, we seek help from Keynes’ ideas and in the financial Keynesianism literature initiated by Keynes himself and developed by several authors, in particular Hyman Minsky and Jan Kregel.

In this regard, we submit that while finance was already a core element in Schumpeter’s analysis, a more refined elaboration of its role came with Keynes, Minsky and Kregel. Keynes introduced money and the expectations of the financial market as central features of the system’s dynamics (Keynes 1936; Kregel 1999). Minsky extended that view through the ‘Wall Street Paradigm’ where capitalism is conceived as essentially a financial system, and prone to waves of financial fragility and economic vulnerability (Minsky 1982, 1986). Kregel broadened Minsky’s theories by linking them to development as well as introducing exchange rate instability, derivatives and the ‘international dimension’ to our understanding of how the financial structure of an economy is *always* a key element of its development path (Kregel 1998, 2001a, 2001b, 2004, 2010, 2014; Kregel and Burlamaqui 2005).

The novelty here is not ‘financing for development’, but *macro-finance*: the integration between the way the financial system works and how it should be structured and governed to effectively foster innovation and development. Schumpeter understood the importance of such a framework, but he never developed it fully. We use this body of work by Keynes, Minsky and Kregel as a bridge and propose that successful *development processes* are necessarily coupled with proactive financial structures and robust economic and financial governance oriented towards industrial financing. We suggest that this particular policy and institutional package enables countries to continuously upgrade their technological and innovation capabilities and engage in a strategy of *following as a prelude for surpassing*. That is, development strategies should not be visions and plans regarding how to catch up with regional and/or global benchmark countries, but rather should focus on how to surpass them. Catch-up might serve as an interim strategy at best.

²Recall that in Schumpeter’s framework development *begins* with entrepreneurship, credit and innovation. The credit part was largely forgotten in the neo-Schumpeterian literature. Perez (2002) and Kregel and Burlamaqui (2005) both attempt to reincorporate finance into the evolutionary process. See also O’Sullivan (2006) for further insights in the same direction. Our claim is that these are efforts to *reclaim and extend the original Schumpeterian perspective* rather than to refine the neo-Schumpeterian approach.

A core point is our suggestion, following Minsky (1982, 1986), that capitalism is essentially a financial system (which may deteriorate into a collection of ‘Ponzi Nations’, as it did in 2008). However, we are also adding a Schumpeterian dimension, by pointing out that under certain institutional and financial arrangements, not yet fully explored from a theoretical perspective, capitalism may also become an innovation system creating wealth and a positive sum game for the economy.

This framework might help us to rethink how both domestic and international policy-making bodies should think about development processes and in particular how domestic growth and competitiveness policies could be re-shaped.

Before we proceed, let us be clear about what we want to propose. In one sense, what we are arguing runs close to what Amsden and Hikino (1994) have submitted as a ‘new learning paradigm’ to assess late industrialization. In their contribution to the well-known Baumol, Nelson, and Wolff (1994, p. 28) volume on convergence and catch-up, they explicitly advance the leapfrogging hypothesis:

Leading American and German enterprises could and did leapfrog ahead of Britain in the most dynamic sectors such as chemicals and steel because British firms could not establish impenetrable international entry barriers in the nineteenth century.

However, these competition dynamics are not taken as an ongoing evolutionary process, but quickly dismissed as an historical episode as ‘[b]y the twentieth century this strategy had become impractical,’ (*ibid*). We disagree with that interpretation. In our approach, leapfrogging is an intrinsic feature of success in Schumpeterian competition. It happened with American and German enterprises in the nineteenth century, but also with Toyota, Fanuc, Nokia and Acer in the twentieth and is happening with Google, Apple, Samsung and Huawei in the twenty-first. And we propose that country-level development follows similar dynamics.³

Considering this, our claim is either broader or narrower, depending on the perspective one adopts. It is broader in the sense that we are indicating that there is nothing intrinsically new about late industrialization. An appropriate analytical framework for analyzing development processes—late or early—is what is missing. It is narrower in the sense that we are not claiming to have invented this analytical framework; rather, we are just borrowing from Schumpeter, Keynes, Minsky and Kregel and maybe doing—at most—some creative adaptation.⁴

2. Converging policies, diverging trajectories

Following the takeover by the Washington Consensus (WC) policy package in the 1980s and the creation of the World Trade Organization (WTO) in 1995, we witnessed a

³Country and industry/regional-level dynamics do not necessarily follow the same patterns. For instance, some companies and industries might surge ahead in underdeveloped contexts (for example, the emergence of Skype from post-Soviet Estonia). Also, within countries some cities/regions might surge ahead while others fall behind (see Audretsch (2015); also see Imbs and Wacziarg (2003) for a discussion on how sectoral diversification and agglomeration dynamics change as countries develop).

⁴Furthermore, Schumpeter had important predecessors (such as Marx, Sombart and Veblen, among others) and successors (such as Freeman, Rosenberg, Nelson, and Winter, among others). In what follows, we use Schumpeter as our departure point because in our understanding he provides the best combination of a bird’s eye view of capitalist dynamics—combining economics, sociology, politics and culture—and a permanent quest for theoretical and analytical depth.

growing homogeneity among development policies. While emulation of successful policies is historically nothing new (Reinert 2009, 2011), both the WC and the WTO and its descendants (such as bilateral trade agreements) assume universal rules and institutions that should be replicated by developing countries. All these agreements internationally regulate areas that were previously left to countries themselves to govern.⁵ Consequently, what we have witnessed during the past 30 years is a strong convergence in formal policies—from patent policies to financial regulations and the emergence of a ‘best practice’ or ‘one size fits all’ approach to development (Karo and Kattel 2010; Levy 2014). Such approaches, perhaps paradoxically, assume that ‘re-engineering’ of governance institutions (Levy 2014) will lead to converging economic fortunes (in terms of gross domestic product (GDP) per capita). This increasing policy convergence leads, not surprisingly if looked at from the perspective we are suggesting, to diverging economic fortunes. The reason for this is quite clear: *economic agents are creative, firms are agents of transformation and institutional landscapes vary substantially*. Therefore, in spite of converging policies and rules, the search for change in order to gain market niches is what keeps moving them, and divergence is the outcome. In what follows, we do not intend to provide an exhaustive empirical overview of divergence; rather, we offer only snapshots of development trajectories. We hope this extremely condensed discussion suffices to question the idea that successful development trajectories should be understood as processes of convergence and catching-up at work in the global economy.

As Figure 1 shows, if we take US GDP per capita as the goal that all convergence and catch-up development processes should aim for, we see that during the last 60 years there is no clear trend of catching-up or convergence globally. Indeed, judging from this figure, one can even argue that with the establishment of the WTO, divergence between regions and between countries has in fact become much more pronounced.

Indeed, we see impressive success stories such as Japan, South Korea, Taiwan and Singapore, which have not only caught up with Western Europe and the US but also, in the process, changed both the technological and business organization frontiers, *leapfrogged* ‘Western’ best practices and completely left behind Latin America and what used to be called the Soviet Union. In particular, the latter region, Eastern Europe and former Soviet republics, experienced massive changes in the 1990s and fell rapidly behind East Asian economies that were substantially less developed and poorer only a few decades earlier. As Guerrieri argues—less than a decade after the fall of the Berlin Wall—the East Asian economies ‘have surpassed Eastern Europe in many industries, not only in traditional product groups, but also in more technologically sophisticated sectors’, and this is particularly so in ‘R&D-intensive (science based) sectors’ (1998, p. 20). While Eastern Europe’s share in world trade grew from 0.73 per cent in 1980 to 0.95 per cent in 1995, East Asia’s share grew in the same period from 3.80 per cent to 10.83 per cent (*ibid*, p. 29). This trend is particularly pronounced for science-based industries: Eastern Europe’s share grew from 0.29 to 0.39 per cent in the period from 1980 to 1995; East Asia’s share grew from 4.83 to a staggering 17.82 per cent (*ibid*, p. 38). One can argue that the transition of the Soviet Union was a particularly badly managed process where

⁵Many heterodox economists have discussed the impact of the WTO on development, and useful summaries of these discussions may be found in Correa (2000), Gallagher (2005), Li and Correa (2009), Shadlen (2004, 2005), Thrasher and Gallagher (2008) and Wade (2003).

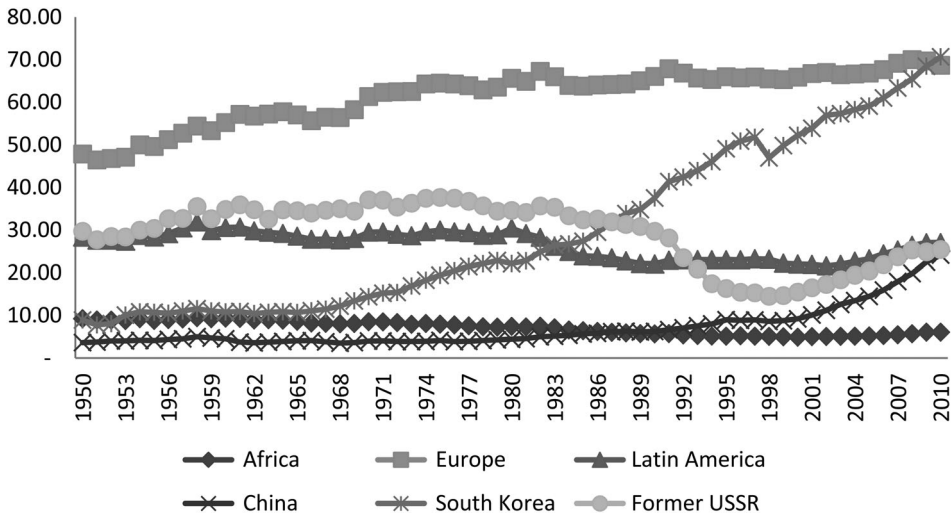


Figure 1. GDP per capita as a percentage of US GDP per capita, 1950–2010 (regional simple averages, 1990 Geary–Khamis dollars)

Source: Conference Board and Groningen Growth and Development Centre (2012).

looting and theft were the norm. Furthermore, if we look at Eastern European countries, such as Hungary, an early transition success story involving high levels of foreign direct investment (FDI) and high technology exports, we still see a surprisingly similar picture. Figure 2 depicts South Korea's and Hungary's highly diverging fortunes between 1980 and 2005. While South Korea's GDP per capita more than quadruples during this period, Hungary rapidly deindustrializes and by 2005 its GDP per capita has barely risen above the 1980 level.

Today, China is doing—on steroids—precisely the same as South Korea and other Asian 'tigers' did during the previous decades. If we take, for instance, the development paths followed by Russia and China since the late 1980s, it is clear that there is no convergence whatsoever, but rather accumulating divergence. As Nee (2007, p. 6) states:

While in 1990 China's gross domestic product (GDP) was 60 percent that of Russia, by the end of the decade the numbers had been reversed. While Russia saw an unprecedented increase in poverty, China saw an unprecedented decrease.

According to the World Bank (2004), transformative economic growth in China resulted in a population of 170 million moving out of absolute poverty, accounting for more than 75 per cent of poverty reduction in the developing world from 1990 to 2000. China's explosive economic growth has demonstrated self-sustaining momentum. *The Economist* (2006, p. 10) predicted that by 2040 China would emerge as the largest economy in the world. Not surprisingly, international economic institutions now view China as the latest entry in the pantheon of successful developmental trajectories, along with South Korea, Taiwan and Japan.

A comparison of Asia and Latin America leads us to similar results: no convergence or catching-up, but another case of continuous divergence. In a recently published book on

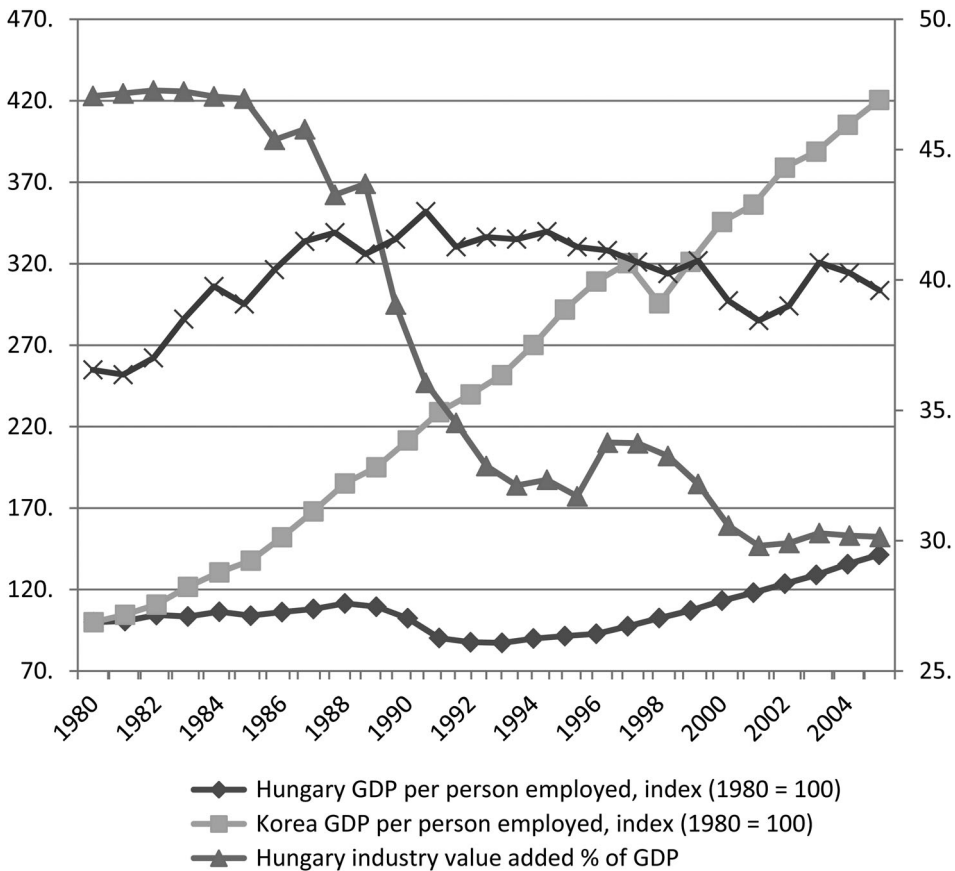


Figure 2. East Asia (Korea) vs. Eastern Europe (Hungary): GDP per person employed index (1980 = 100) (left axis) and industry value added as a percentage of GDP (right axis)
Source: World Bank WDI Online database

the subject, Kevin Gallagher and Roberto Porzecanski (2011, p. 27), using China as a proxy for East Asia, succinctly illustrate the point:

China and the Latin American-Caribbean region (LAC) began to implement economic reforms within a few years of each other; China in 1978, much of Latin America in 1982. In 1980, the collective economic output of Latin America and the Caribbean was seven times that of China—14 times greater on a per-capita basis. Nearly 30 years later, China had pulled ahead, with gross domestic product of \$2.7 trillion in 2009 versus pan-regional GDP of \$2.6 trillion in Latin America. Over the three decades, China registered a robust annual economic growth rate of eight percent. The average annual rate in Latin America has been a more modest 3.8 percent. Between 1980 and 2009, GDP per capita increased by 6.6 percent annually in China, while in Latin America, per-capita GDP edged up by a mere 1.7 percent annually during years that were marked by crises and volatility.

Divergence between China and Latin America, measured in terms of their respective shares in global manufacturing exports, is illustrated in Figure 3. China's share keeps climbing, while most Latin American countries see their shares diminish.

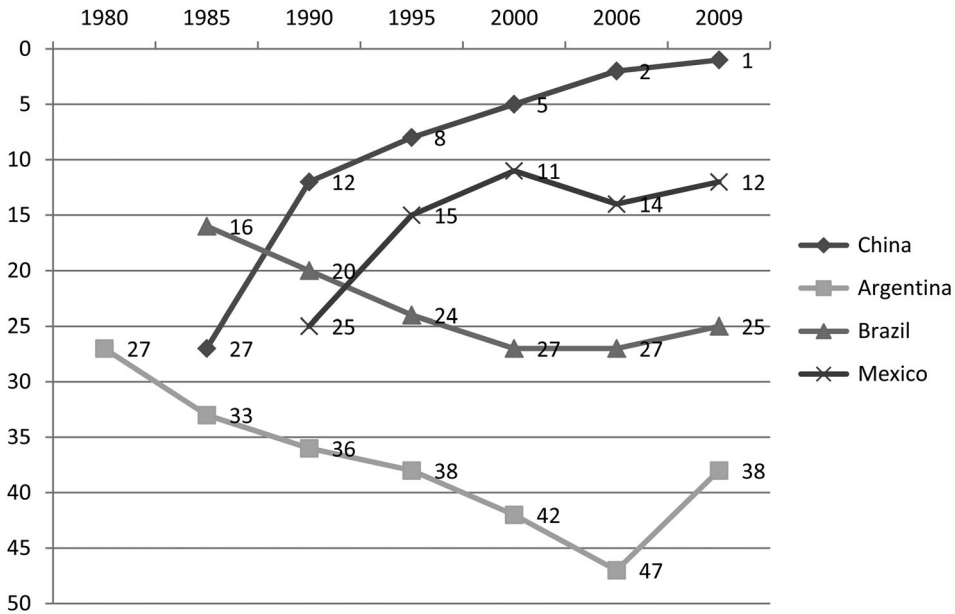


Figure 3. Climbing up and down the ladder: country shares in world manufacturing exports, 1990–2009, listed as positions among top 50 exporting countries
Source: Gallagher and Porzecanski (2011).

Furthermore, if we look within Asia and Latin America individually, divergence is revealed once more. In Asia, China is the country clearly forging ahead of all others; in Latin America, Brazil performs partially the same role. Within Eastern Europe we also do not see convergence; for instance, Poland did not experience any recession during the recent economic and financial crisis, while in 2009 the Baltic economies saw their GDPs drop by more than 15 per cent (Kattel 2010).

Convergence does not describe development trajectories among highly developed nations either. If we look at the dynamics of income growth among European nations since the 1950s, we see that some nations such as Ireland have enjoyed rapid growth and in fact have forged ahead of most developed countries in Europe, while Italy and other Southern European economies are falling behind, particularly since the single market came to force in Europe in the mid-1980s (Figure 4).

Consequently, it is safe to assume that there are different dynamics among nations other than convergence or catching-up. Here, a more skeptical and historically minded reader might ask: even if that is true for the last three or four decades, what if we go back to the ‘classical’ period of convergence and catch-up stories, the ‘Gerschenkronian’ 19th and early 20th centuries? The answer to that question is the same: what happened in the comparative histories of industrialization in Britain, the US, Continental Europe (especially Germany) and Japan was ‘industrial finance’ and creative destruction, leading to leapfrogging rather than catching-up and convergence. What history shows is a succession of episodes of corporations, industries and countries—but especially corporations and industries—overtaking others and becoming leaders. For instance, around the turn of the 20th century, Germany managed to surpass Britain in steel,

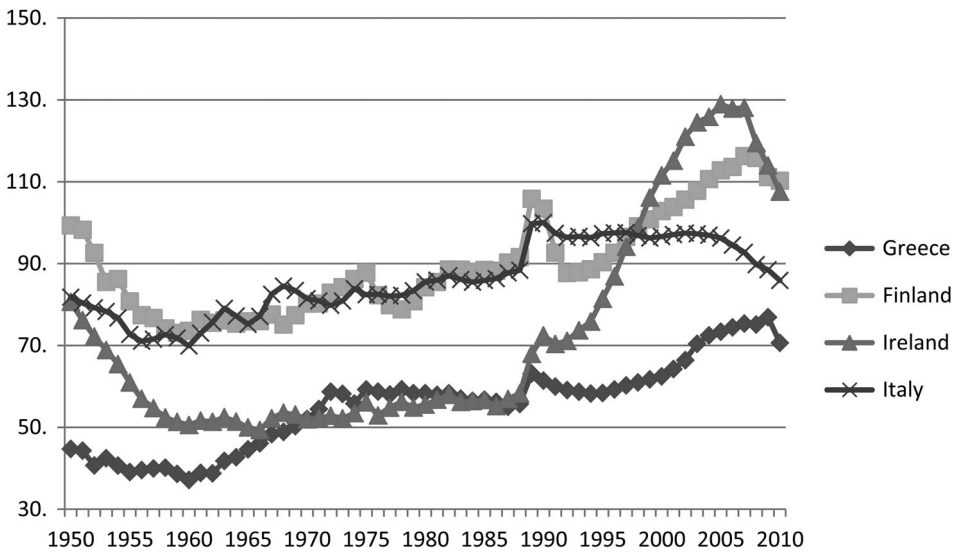


Figure 4. GDP per capita of selected European countries as a percentage of German GDP per capita, 1950–2010, regional simple averages, in 1990 Geary–Khamis dollars
Source: Conference Board and Groningen Growth and Development Centre (2012).

chemistry, electricity, pharmaceuticals, investment banking and corporate-based research by introducing new methods of production, organization, financing and new institutional arrangements (Landes 1969; Watson 2011).

Similarly, Japan introduced, along with industry-specific innovations, a new set of institutional innovations to foster development by means of a very coherent industrial policy (building on Germany and the US, as we know). As a result, Japan did not ‘converge’ with the West. It leapfrogged Europe and became ‘number two’, threatening to displace the US as number one by the 1980s. The financial bubble of the 1990s buried this goal—at least for now—but the ‘Governing the Market’ development strategy perfected by Japan, adopted later by its neighbors and now being re-invented by China, enabled Japan to at least for some time leapfrog and surpass technologically, rather than converge with, most of the developed world (Dore 1987; Fruin 1992; Johnson 1982; Studwell 2013; Vogel 1979).

Conceptually speaking, this is precisely what Britain, Germany and the US had done before: leapfrogging through powerful paradigm- or frontier-changing innovations, rather than converging or catching-up (Perez 2002). The theoretical framework best suited to understanding these processes is Schumpeterian, encompassing competition and ‘creative destruction’ performed with borrowed money, embedded into the wider institutional framework and leading to differentiation, stumbling back, sneaking up and soaring ahead. Before we show the broad contours of that framework, we must take a brief detour and critically appraise the concepts of convergence and catch-up processes.

3. Convergence and catch-up: equilibrium in development trajectories?

There are many theories that try to explain convergence and catching-up. In essence, almost all economic development theories that deal with long-term economic growth,

one way or another, touch upon convergence. What follows is again but a snapshot of theories dealing with convergence and catch-up, and is not meant to be an exhaustive treatment. These theories can be divided into two schools of thought: first, theories that explicitly or implicitly assume that nations will eventually converge towards equilibrium; second, theories that understand international economic development through stages (see Rostow 1960 for the classic statement, and Baumol, Nelson, and Wolff 1994 for further elaboration).

Convergence theories tend to assume that technology and innovation are exogenous to development and more or less freely available to all, and that countries are similar to each other but for their productive structures. For these theories, development is essentially a matter of copying best practice solutions and getting the institutions right for such copying (Boyer 1993). Convergence theories thus assume that there is one best route to development (in terms of technological, organizational and financial capabilities exhibited by leading firms) at any given point in time and that countries which follow it will converge towards similar levels of productivity and per-capita income. Policies and institutions, including international trade agreements, either foster the movement of all countries towards such 'equilibrium imposed on history' or are a hindrance to expected convergence.

Catch-up seems to be one of those 'general purpose concepts', given the multiple uses it allows. In a recent book, Nelson *et al.* (2011, pp. 2–3) provide the following definition:

Catch-up may be defined as the process in which a late-developing country narrows its gap in income (as one may specify by the word 'economic catch-up') and in technological capability (equally 'technological catch-up') vis-à-vis a leading country This fact has been evident since, say, the Industrial Revolution of the 18th Century and is now even more so as many industries became technology-intensive.

One cannot say that this is a particularly precise definition. It is more like a reference to a multidimensional process that some countries go through and others do not. The authors acknowledge this before introducing the concept, as 'some countries did catch-up and some even forged ahead. Some, however, actually fell behind' (*ibid.*, p. 2).

This imprecision creates a conceptual problem. Is catch-up a *tendency* or a *possibility* (some achieve it, some do not) for late developers? Furthermore, catching-up seems to imply 'convergence' (narrowing the income gap) and some kind of *alignment* at the technological frontier, in which case that frontier must be seen as a well-defined object that moves incrementally, as in a Solow–Swan growth model. However, if some late developers actually 'forge ahead', then neither convergence nor alignment are sure to happen.

Before we conclude this brief discussion, a mandatory mention of Alexander Gerschenkron is due. Gerschenkron, the doyen of economic history in the US during the fifties and sixties, was a *product* of Schumpeter's milieu and, like Schumpeter himself, influenced a whole generation of Harvard economists through his required graduate course in economic history (Fishlow 2001). Although often associated with catch-up narratives, his thesis on the 'advantages of backwardness' (Gerschenkron 1962, p. 5) distances him from stages theories à la Rostow, and brings him very close to our proposed 'leapfrogging hypothesis'. In his review of the classic book, Fishlow (2001, p. 1) provides a concise and well-balanced perspective pointing towards that conclusion:

Gerschenkron's analysis is conspicuously anti-Marxian. It rejected the English Industrial Revolution as the normal pattern of industrial development and deprived the original accumulation of capital of its central force in determining subsequent expansion. It is likewise anti-Rostovian. There were no equivalent stages of economic growth in all participants. Elements of modernity and backwardness could survive side by side, and did, in a systematic fashion. Apparently, disadvantageous initial conditions of access to capital could be overcome through new institutional arrangements. Success was indicated by proportionally more rapid growth in later developers, signaled by a decisive spurt in industrial expansion.

We cannot delve into a comprehensive discussion of that controversial matter here but would like to suggest that his thesis, more historically than theoretically crafted, sides more with Schumpeterian leapfrogging processes than with the other development theories just discussed. Hirschman and the Cepal pioneers such as Prebisch and Furtado also developed their perspectives and policy recommendations along the same Gerschenkronian approach (see Adelman 2013 for a good overview).

Let us conclude this section by re-stating one of our initial points. 'Convergence' and 'catch-up' are rather loose concepts to frame development narratives and are more akin to the idea of a tendency towards equilibrium imposed on history. They suggest that, once a nation manages to 'develop' by reaching the existing, given technological frontier (a process that may or may not happen), it tends to 'stay there', or that development once achieved is self-sustaining, but maybe not even that, since nations can also 'forge ahead or fall behind'. In order to get a firmer grasp of these processes of structural change where catching-up is *temporary*, and just a *prelude* for forging ahead or falling behind, let's move to the Schumpeterian terrain, and to an alternative framework.

4. Divergent development trajectories: schumpeterian competition by means of innovation, leapfrogging and finance

Schumpeter's theory of innovation is an application to economics and business of his wider theory of how evolutionary change takes place in societies (Andersen 2009). In *Business Cycles*, Schumpeter (1939, p. 97) states that he:

believes, although ... cannot stay to show, that theory [of innovation] here expounded is but a special case, adapted to the economic sphere, of a much larger theory which applies to change in all spheres of social life, science and art included.

His 1912 *Theorie der wirtschaftlichen Entwicklung/The Theory of Economic Development* (Schumpeter 1912)⁶ implicitly assumes a similar theory, without going into details either. We can infer that what Schumpeter meant by this 'larger theory' of change in social life is that change is driven by entrepreneurial, creative *entities*. These entities may take the form of persons or 'new men', as he called them in 1939, or organizations, which subsequently became his focus in 1942, that look for 'new combinations', innovative solutions and bring forth evolutionary changes. These changes include entirely new ways of doing things (in business, politics, art, science and so on) that will spread, in some cases more than others,

⁶We use here the German original first edition as in later editions (that served as the basis for the English translation as well), these discussions were cut by Schumpeter; so, for example, while the second chapter of the original edition runs to almost 100 pages, the English translation carries only half as many. In this chapter, Schumpeter discusses his theory of innovation.

throughout the given sphere of life. Some of these will change value systems and disrupt incumbent hierarchies.

In the seventh and last chapter of this book,⁷ summarizing his argument, Schumpeter argues that innovations as new combinations ('neue Kombinationen') form the internal dynamics of an economy that break the economy away from existing paths into new directions and thus force firms, individuals and eventually institutions to adapt. For Schumpeter, such dynamics define the form of the economy ('Wirtschaftsform'). The key point is that *disruptions* and *dislocations* emerge as fundamental outcomes, not convergence.

Furthermore, in Schumpeter's framework the core of the 'process of economic development' is not restricted to technology. It springs from virtuous interaction among finance (credit), entrepreneurship and competition by means of innovation, which builds up as a struggle for survival and growth in a structurally uncertain environment (Schumpeter [1942] 1992; see also O'Sullivan 2006; Perez 2002). Profits that result from dominant market positions are always under threat from imitative strategies or other firms' innovative behaviors; they can only be maintained by continuous product differentiation, branding and productivity enhancement. Very importantly, neither the process nor the outcome—successful innovations and structural change—are taken for granted. For each Thomas Edison, Henry Bessemer, Henry Ford or Larry Page, there are hundreds of failed attempts that end up in bankruptcy courts. It is important to note that such Schumpeterian divergence is a powerful force for changing the economic behavior of individuals and firms. Indeed, Schumpeterian divergence enforces diversity, and diversity—not convergence—is at the heart of leapfrogging processes.

In any event, firms that survive invariably innovate—that is, they exploit opportunities for change by applying new ideas, methods or combinations of resources. However, while the innovation process is ceaseless, success is not. The very success of firms' reactions to competitive challenges acts to reinforce uncertainty, instability and diversity, calling forth new reactions and innovations and leading to continuous economic change. Many of these innovation processes are in effect firms trying to imitate other successful companies. Yet success is not achieved through a one size fits all formula. It engenders massive asymmetries as it generates positive feedback from markets to producers, which translates to different competitive strategies for some and bankruptcy for many.

Firms thus compete continuously for market niches, with asymmetric results. Some achieve success, with strengthened technological, organizational or legal⁸ capabilities, and above-average (their own) past profits. Other firms fail and either disappear, are reduced to marginal activities or move into other business segments. As Schumpeter ([1942] 1992, p. 32) put it, 'to escape being undersold, every firm is compelled to follow suit, to invest, and to accumulate'. However, the key point here is that the pressure of imitation via competition does not lead to *one* best business practice in a given sector—that is, to convergence of business practices. Rather, it leads to continuous technological, organizational and legal change; financial innovation and differentiation; and temporary monopolization of market opportunities.

For instance, while radio was one of the most dynamic industries in the 1920s, the same cannot be said in 2015. However the leading radio manufacturer in the 1920s, the Radio

⁷Translated into English only in 2002 in a special issue of *Industry and Innovation*.

⁸Such as patents, copyrights, trademarks and a whole host of intellectual property-based monopolies.

Corporation of America (RCA), initiated crucial creative destruction processes. These processes led to the successive emergence of the black-and-white and color television industries; these revolutionized the news and entertainment industries; this paved the way for the development of the videocassette recorder (VCR) and computers; which in turn led to the internet, mobile phones and social networking.

Along the way, the US lost almost all capabilities to produce any consumer electronics but, of course, gained leading positions in today's dynamic industries, such as internet search and social networking. In Schumpeter's framework, some industries and corporations soared ahead while others fell behind and disappeared (see also Chandler 2001).

In other words, creative destruction processes bring forth more than technological changes at company level, and are not restricted to a sectoral level. These processes generate entire new industries based on technological, organizational, spatial and cultural restructuring. Electricity made radios possible, but also home appliances that transformed how food is stored that in turn made suburban living and mass consumption possible (Chandler 2001; Landes 1969; Perez 2002). In other words, electricity provided open-ended possibilities for developing new technologies in a whole host of sectors. Corporations used that to re-design, over and over, the 'technological frontier', and leapfrog.

General Electric, Google, Apple, Baidu and Amazon provide us with clear examples of our main proposition. These companies have changed the possibilities for organizing our daily lives through successful 'gales of creative destruction'. They encompass the full Schumpeter catalog of technological, organizational, spatial, legal, financial and strategic changes. Most importantly, however, they did not 'catch-up'. They leapfrogged their competitors and *re-designed* the 'frontier'. They have revolutionized entire industries and become dominant players on a global scale in a very short period of time (Issacson 2011; Levy 2011; Stone 2013). Obviously, these socio-economic changes are not bound by national borders. However, the nature of trade regulations and agreements shape how creative destruction works out in a given country, and this should be a key theme in a development agenda for the twenty first century. Leapfrogging processes thus do not necessarily depend on, or spring from, groundbreaking scientific advances. Their importance lies in the strategic use of both old and new technologies in creative ways. That requires finance and productivity-oriented financial governance.

5. Finance in schumpeterian development processes: bringing financial keynesianism in

Schumpeter's theory of economic development stands on two pillars: innovations that increase productivity in production, and finance that supports these innovations. For Schumpeter, finance plays the role of the handmaiden of creative destruction that allows industry to produce technological advance and economic development. However, Schumpeter did not deal in detail with finance, nor did he view the financial system as a system that is, similar to the production system, based on innovations. Here enters Minsky.⁹ For Minsky, bankers are innovators as much as industry captains, and both sides of the economy, finance and production, are intimately linked through corporations' balance sheets. Firms face inherent uncertainty in a competitive environment, including the necessity of taking on liabilities to set up or upgrade production and/or

⁹The so-called development pioneers, perhaps most notably Ragnar Nurkse and some Latin American economists such as Raul Prebisch, were well aware of the important role that the financial structure plays in an economy (for a discussion, see Kattel et al. 2009).

innovate. This uncertainty is reflected in the prices of their financial assets, in the way their cash flows and cash commitments evolve over time and, in particular, in the way financial markets evaluate them (Minsky 1982, 1986).

According to Minsky (1982, p. 63), modern capitalism has to be understood through what he called the ‘Wall Street Paradigm’:

Looking at the economy from a Wall Street board room, we see a paper world—a world of commitments to pay cash today and in the future. These cash flows are a legacy of past contracts in which money today was exchanged for money in the future. In addition, we see deals being made in which commitments to pay cash in the future are exchanged for cash today. The viability of this paper world rests upon the cash flows (or gross profits after out-of-pocket costs and taxes) that business organizations, households, and governmental bodies receive as a result of the income-generating process.

According to Minsky, financial institutions are profit-seekers, and driven—in the same way that the industrial structure is—by competition and innovation. Profits arise from the exploitation and protection of their acquired/developed competitive and knowledge-based advantages. In finance, as in production, successful innovation produces dominant competitive positions, which can only be challenged by firms that are capable of reproducing the innovation or perfecting another technique that is more profitable and more attractive to the market. Innovations are inherent to the financial system.

However, government regulations play a prominent role in guiding the direction in which the financial sector innovates. Governments can slow down diffusion or boost it. Financial deregulation since the 1970s did precisely the latter, as innovations were quickly imitated and widely diffused. The result was divergence rather than convergence. Canada, Brazil, Taiwan and China dealt with the cluster of sub-prime prompted financial innovations in a very different fashion than the US, the UK and most of Europe, and weathered the crisis much better. The key lesson here is that, in a financially globalized world, domestic institutions and modes of financial governance matter more than ever.

What was once a bank’s most important source of earnings, the net interest margin between borrowing and lending rates and the size of its deposit multiplier, has been declining dramatically in the US over the past several decades. To meet this shortfall in earnings, commercial banks have been forced, by competition, to innovate. New productive areas of ‘Schumpeterian’ financial engineering were developed, such as mergers and acquisitions and financial restructuring. Others had no relationship with productivity increases whatsoever, including the provision of financial services in order to generate fee and commission income by ‘over-leveraging’ their proprietary trading in financial assets, and ‘reckless’ innovations such as credit default swaps and all sorts of betting techniques (Kregel 1998, 2001a).

This ‘bad finance’ is a potential outcome essentially missing from Schumpeter’s framework. Here, both Minsky and Kregel make their mark. Their analysis of ‘robust financial governance’ is pivotal in determining whether the given financial system is oriented more towards funding the productive sector and sustaining innovation and development, or biased towards gambling, financial arbitrage and betting against its clients. Kregel’s contribution in that realm is, following Minsky, to show that the way the financial sector is organized and governed is a core dimension of any development process.

Kregel (2001a, 2001b, 2004) provides us with sharp analyses of the dysfunctional impact of unsound financial governance on development, innovation and leapfrogging processes. By demonstrating that a Minsky crisis happened in East Asia, describing the role of derivatives in amplifying it, and analyzing the US sub-prime crisis as a Ponzi scheme from the very beginning (with no evolution from hedge and speculative phases), he links (bad) finance to *regressive* development.

Kregel also suggests that financial systems' organization and their impact on the productive sectors do not depend solely on domestic financial governance, but also on global processes and international institutional arrangements, especially in the case of developing nations. Exchange rate regimes, capital account management, trade openness and international treaties play a key role in shaping development trajectories (Kregel 2004).

While Minsky shows that the structure of an economy consists of units with different balance sheets (hedge, speculative and Ponzi) that mirror the macro-financial evolution, Kregel analyzes the international dimension of financial governance and how the interplay between domestic and global forces and institutions can produce hedge, speculative or Ponzi *countries* (or regions). Kregel (2001a, 2004) also underlines how reliance on foreign financial flows, in particular in the form of short-term financial flows, tends to drag countries into Ponzi schemes.

What Minsky and Kregel demonstrate is that Schumpeterian competition and 'good finance' should be supplemented by an evolutionary, and not so optimistic, theory of the workings of the financial system. In other words, leapfrogging as described above is not only a technological and institutional issue, but also a financial governance matter; a policy of building a financial structure that leads to productive investments and helps to manage creative destruction (see Studwell 2013 for evidence—not theory—on this issue).

6. Role of the state in leapfrogging as a development strategy

Leapfrogging as a development strategy leads naturally to the proposition that a radical new beginning is needed for the public sector to fulfill this role. In our view, we need to start re-conceptualizing the role of the state in development by first understanding that the state plays diverse roles (for example, in finance and innovation) and thus a holistic or 'umbrella' conceptual approach is necessary. Mazzucato's (2013) *The Entrepreneurial State* provides forceful insights into how (Western) governments were—often in disguise as military research and development—powerful visionaries and funders of technological advances. We suggest that conceptualizing such activity in a Schumpeterian-Keynesian-Minskian framework allows for a stronger theoretical understanding of the 'entrepreneurial state' and the role of the state in development.

We propose that there are three key elements in the concept of the entrepreneurial state:

- (i) A Schumpeterian banking system: A financial system dominated by universal banks with close ties to commerce and especially industry, geared towards finance for development. This is what Hilferding ([1919] 1981) develops under the label of *Finance*

*Capitalism*¹⁰ (see also Minsky 1986; and Wray 2010, for a discussion of Minsky's analysis).

- (ii) The state as the entrepreneur-of-first-resort: An extension to the state of Schumpeter's entrepreneurial function. As the history of development and technological evolution shows, the state is, more often than not, a key entrepreneur in development processes and should be at the center of a *theory* of economic development (but is not). An institution that combines the functions of 'macro-strategist' (managing interest and exchange rates, capital flows and price and financial stability); 'venture capitalist in chief' (forging and funding industrial, innovation and technology policies); and 'creative destruction management' (stimulating the creative part of the process in order to speed productivity enhancement and innovation diffusion and acting as a buffer to its destructive dimension) clearly 'qualifies' as entrepreneurial. Furthermore, through its regulatory standards (in relation to health, the environment, schools and the labor market), the state acts as 'technology maker' by framing—both in the sense of limiting and enabling—private sector efforts.
- (iii) The presence of a robust degree of socialization of investment: As supported by Keynes (1936) in the *General Theory*, by Schumpeter ([1942] 1992) in his characterization of 'socialism' in *Capitalism, Socialism and Democracy*, and by Minsky's (1986) 'Big-Government plus Big-Bank' policy prescriptions in *Stabilizing an Unstable Economy*.

As stated by Keynes (1936, pp. 377–378) in the last chapter of the *General Theory* (for an application of this framework to contemporary China, see Burlamaqui 2015):

The State will have to exercise a guiding influence on the propensity to consume partly through its scheme of taxation, partly by fixing the rate of interest, and partly, perhaps, in other ways. Furthermore, it seems unlikely that the influence of banking policy on the rate of interest will be insufficient by itself to determine an optimum rate of investment. I conceive, therefore, that a somewhat comprehensive socialization of investment will prove the only means of securing an approximation to full employment; though this need not exclude all manner of compromises and of devices by which public authority will cooperate with private initiative.

7. Conclusion

Schumpeterian competition—creative destruction by means of innovation—is a permanent leapfrogging process wherein forging ahead and falling behind are expected (predictable) results. Moreover, leapfrogging processes are not technology-driven or techno-institutional constructs. They are outcomes of virtuous feedback loops between financial structure, financial governance and competition by means of innovations that lead to *diverse* technology trajectories and paradigms, and to *open-ended* institutional changes. Divergence, once again, is the norm. Furthermore, there is no fixed technological (or financial) frontier; *competition itself* is a process of permanently redefining and reinventing it. Moreover, this is valid for firms, industries and countries. Development in itself is thus an open-ended and highly uncertain process wherein there are hardly any 'best

¹⁰As opposed to Minsky's 'money manager capitalism', wherein the value-extraction component of finance went well beyond its value-creation dimension.

practices', since they are continually challenged by innovations and imitation is often 'creative'. Financial structures and financial governance are still largely absent in Schumpeter's framework, but we have indicated how the contributions of Keynes, Minsky and Kregel allow us to dig deeper in that bridging exercise. However, this is a task for another article.

We invite the reader to return to our opening proposition: leapfrogging by means of innovation and finance, rather than convergence or catch-up, is the best way to approach development history in general and, especially, the trajectories of 'late developers' in the last several decades.

Acknowledgements

This is a substantially revised and extended version of our previous research on the subject (see Burlamaqui and Kattel 2014, 2015). We are grateful for suggestions we received from two anonymous reviewers.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Adelman, Jeremy. 2013. *Wordly Philosopher: The Odyssey of Albert O Hirschman*. Princeton: Princeton University Press.
- Amsden, Alice, and Takashi Hikino. 1994. 'Staying Behind, Stumbling Back, Sneaking Up, Soaring Ahead: Late Industrialization in Historical Perspective.' In *Convergence of Productivity: Cross National Studies and Historical Evidence*, edited by W. Baumol, R. Nelson, and E. Wolff. New York: Oxford University Press.
- Andersen, Esben Sloth. 2009. *Schumpeter's Evolutionary Economics: A Theoretical, Historical and Statistical Analysis of the Engine of Capitalism*. London: Anthem.
- Audretsch, David. 2015. *Everything in its Place: Entrepreneurship and the Strategic Management of Cities, Regions, and States*, Oxford: Oxford University Press.
- Baumol, William, Richard Nelson, and Edward Wolff. 1994. *Convergence of Productivity. Cross-National Studies and Historical Evidence*. Oxford: Oxford University Press.
- Boyer, Robert. 1993. 'The Convergence Hypothesis Revisited: Globalization but still the Century of Nations?' Paper presented at the Conference for Domestic Institutions, Trade and the Pressures for National Convergence, MIT Industrial Performance Center, Bellagio, February, 22–26.
- Burlamaqui, L. 2015. 'Finance, Development and the Chinese Entrepreneurial State.' *Brazilian Journal of Political Economy* 35 (4): 728–744. doi: <http://dx.doi.org/10.1590/0101-31572015v35n04a03>.
- Burlamaqui, Leonardo, and Rainer Kattel. (2014). 'Development Theory: Convergence, Catch-up or Leapfrogging? A Schumpeter–Minsky–Kregel Approach.' In *Contributions to Economic Theory, Policy, Development and Finance: Essays in Honor of Jan A. Kregel*, edited by D. Papadimitriou. London: Palgrave Macmillan.
- Burlamaqui, Leonardo, and Rainer Kattel (2015). 'Assessing Divergent Development Trajectories: Schumpeterian Competition, Finance and Financial Governance.' *Brazilian Journal of Innovation*, forthcoming.
- Chandler, Alfred D. 2001. *Inventing the Electronic Century: The Epic Story of the Consumer Electronics and Computer Industries*. New York: The Free Press.
- Conference Board and Groningen Growth and Development Centre. 2012. Total Economy Database, Accessed March 2012. <http://www.conference-board.org/economics/>.

- Correa, Carlos M. 2000. *Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options*. London: Zed Books.
- Dore, Ronald. 1987. *Taking Japan Seriously: A Confucian Perspective on Leading Economic Issues*. Stanford: Stanford University Press.
- Fishlow, A. 2001. 'Alexander Gerschenkron: A Latecomer Who Emerged Victorious.' Review of *Economic Backwardness in Historical Perspective*. Project 2001: Significant Works in Economic History. Accessed December 20, 2015. http://eh.net/book_reviews/economic-backwardness-in-historical-perspective-a-book-of-essays/.
- Fruin, W. Mark. 1992. *The Japanese Enterprise System: Competitive Strategies, Cooperative Structures*. New York: Oxford University Press.
- Gallagher, Kevin P., ed. 2005. *Putting Development First: The Importance of Policy Space in the WTO and International Financial Institutions*. London and New York: Zed books.
- Gallagher, Kevin, and Roberto Porzecanski. 2011. *The Dragon in the Room: China and the Future of Latin American Industrialization*. Stanford: Stanford University Press.
- Gerschenkron, A. 1962. *Economic Backwardness in Historical Perspective*. Cambridge, MA: Harvard University Press.
- Guerrieri, Paolo. 1998. 'Trade Patterns, FDI, and Industrial Restructuring of Central and Eastern Europe.' BRIE Working Paper Series, no. 124.
- Hilferding, Rudolf. [1919] 1981. *Finance Capital. A Study of the Latest Phase of Capitalist Development*, edited by Tom Bottomore. London: Routledge & Kegan Paul.
- Hirschman, Albert O. 1958. *The Strategy of Economic Development*. New Haven: Yale University Press.
- Imbs, J. and R. Wacziarg. 2003. 'Stages of Diversification.' *American Economic Review* 93 (1): 63–86. doi: 10.1257/000282803321455160
- Isaacson, Walter. 2011. *Steve Jobs*. New York: Simon & Schuster.
- Johnson, Chalmers. 1982. *MITI and the Japanese miracle: the growth of industrial policy*. Stanford: Stanford University Press.
- Karo, Erkki, and Rainer Kattel. 2010. 'The Copying Paradox: Why Converging Policies but Diverging Capacities for Development in Eastern European Innovation Systems?' *International Journal of Institutions and Economics* 2 (2): 167–206.
- Kattel, Rainer. 2010. 'Financial and Economic Crisis in Eastern Europe.' *Journal of Post Keynesian Economics* 33 (1): 41–60. doi: 10.2753/PKE0160-3477330103
- Kattel, Rainer, Jan A. Kregel, and Erik S. Reinert. 2009. 'The Relevance of Ragnar Nurkse and Classical Development Economics.' In *Ragnar Nurkse (1907–2007): Classical Development Economics and its Relevance for Today*, edited by R. Kattel, J. A. Kregel, and E. S. Reinert. London: Anthem.
- Keynes, John Maynard. 1936. *General Theory of Employment, Interest and Money*. London: Macmillan.
- Kregel, Jan A. 1998. 'The Past and Future of Banks.' Institute for Money, Banking and Financial Studies, Luigi Einaudi Research Paper No. 21. Rome: Bank of Italy.
- Kregel, Jan A. 1999. 'Alternative to the Brazilian Crisis.' *Revista de Economia Política – Brazilian Journal of Political Economy* 19 (3/75): 23–38.
- Kregel, Jan A. 2001a. 'Yes, 'it' did happen again: the Minsky crisis in Asia.' In *Financial Keynesianism and Market Instability: The Economic Legacy of Hyman Minsky*, edited by R. Bellofiore and P. Ferri. Cheltenham: Edward Elgar.
- Kregel, Jan A. 2001b. 'Derivatives and Global Capital Flows: Applications to Asia.' In *Financial Liberalization and the Asian Crisis*, edited by H. J. Chang, G. Palma, and H. Whitaker. New York: Palgrave.
- Kregel, Jan A. 2004. 'External Financing for Development and International Financial Instability.' G-24 Discussion Paper no. 32. October.
- Kregel, Jan A. 2010. 'What would Minsky have thought of the mortgage crisis?' In *The Elgar Companion to Hyman Minsky*, edited by D. Papadimitriou and R. Wray. Cheltenham: Edward Elgar.

- Kregel, Jan A. 2014. *Economic Development and Financial Stability: Selected Essays*, edited by R. Kattel. London: Anthem.
- Kregel, Jan A., and Leonardo Burlamaqui. 2005. 'Innovation, Competition and Financial Vulnerability.' *Brazilian Journal of Political Economy* 25 (2): 5–23.
- Landes, David. 1969. *The Unbound Prometheus: Technological Change and Industrial development in Western Europe from 1750 to the Present*. Cambridge: Cambridge University Press.
- Levy, Steven. 2011. *In The Plex: How Google Thinks, Works and Shapes Our Lives*. New York: Simon & Schuster.
- Levy, Brian. 2014. *Working with the Grain: Integrating Governance and Growth in Development Strategies*. Oxford: Oxford University Press.
- Li, Xuan, and Carlos M. Correa, eds. 2009. *Intellectual Property Enforcement: International Perspectives*. Cheltenham: Elgar.
- Mazzucato, Mariana. 2013. *The Entrepreneurial State: Debunking Public Vs. Private Sector Myths*. London: Anthem Press.
- Minsky, Hyman. 1982. *Can 'IT' Happen Again: Essays on Instability and Finance*. Armonk, ME: Sharpe.
- Minsky, Hyman. 1986. *Stabilizing an Unstable Economy*. New Haven: Yale University Press.
- Nee, Victor. 2007. *Russia and China: The Reversal of Fortunes*. Unpublished manuscript.
- Nelson, Richard R., et al. 2011. *Intellectual Property Rights, Development, and CatchUp: An International Comparative Study*. Oxford: Oxford University Press.
- Perez, Carlota. 2002. *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*. Cheltenham: Edward Elgar.
- O'Sullivan, Mary A. 2006. 'Finance and Innovation.' In *The Oxford Handbook of Innovation*, edited by J. Fagerberg, D.C. Mowery, and R.R. Nelson. Oxford: Oxford University Press.
- Reinert, Erik S. 2009. 'Emulation versus Comparative Advantage: Competing and Complementary Principles in the History of Economic Policy.' In *Industrial Policy and Development: The Political Economy of Capabilities Accumulation*, edited by M. Cimoli, G. Dosi, and J. Stiglitz. Oxford: Oxford University Press.
- Reinert, Sophus A. 2011. *Translating Empire: Emulation and the Origins of Political Economy*. Cambridge, MA: Harvard University Press.
- Rostow, Walt W. 1960. *The Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge: Cambridge University Press.
- Schumpeter, Joseph A. 1912. *Theory of Economic Development*. Berlin: Duncker & Humblot.
- Schumpeter, Joseph A. 1939. *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process, Volume 1*. London: McGraw-Hill.
- Schumpeter, Joseph A. [1942] 1992. *Capitalism, Socialism and Democracy*. New York: Harper Brothers.
- Shadlen, Kenneth. 2004. 'Patents and Pills, Power and Procedure: The North-South Politics of Public Health in the WTO.' *Studies in Comparative International Development* 39 (3): 76–108. doi:10.1007/BF02686283
- Shadlen, Kenneth. 2005. 'Policy Space for Development in the WTO and Beyond: The Case of Intellectual Property Rights.' Global Development and Environment Institute Working Paper, no. 05–06. November.
- Stone, Brad. 2013. *The Everything Store: Jeff Bezos and the Age of Amazon*. London: Bantam Press.
- Studwell, Joe. 2013. *How Asia Works: Success and Failure in the World's Most Dynamic Region*. London: Profile Books.
- The Economist. 2006. 'The new titans. A Survey of the World Economy', 1–18, September 16.
- Thrasher, Rachel D., and K. Gallagher. 2008. '21st Century Trade Agreements: Implications for Long-Run Development Policy.' The Pardee Papers, no. 2. September.
- Vogel, Ezra. 1979. *Japan as Number One: Lessons for America*. Cambridge, MA: Harvard University Press.
- Wade, Robert. 2003. 'What Strategies Are Viable for Developing Countries Today? The World Trade Organization and the Shrinking of 'Development Space'.' *Review of International Political Economy* 10 (4): 621–644. doi:10.1080/09692290310001601902

Watson, Peter. 2011. *The German Genius: Europe's Third Renaissance, the Second Scientific Revolution, and the Twentieth Century*. New York: Harper Collins.

World Bank. 2004. *World Development Indicators*. World Bank: Washington, DC.

Wray, Randall. 2010. 'What should Banks do? A Minskyian Analysis.' Levy Economics Institute Public Policy Brief, Number 115. <http://www.levyinstitute.org/publications/what-should-banks-do>.