

Development Theory: Convergence, Catch-up or *Leapfrogging* and Finance?

Leonardo Burlamaqui¹ and Rainer Kattel²

Abstract

The paper offers four propositions for discussion. First, it argues that instead of the often-assumed convergence among nations, history shows us that divergence is a more appropriate way to conceptualize development trajectories; and that this is especially visible in the last century. Secondly, the paper 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”. Thirdly, we outline this Schumpeterian framework, centered on the concept of leapfrogging through innovation. The paper concludes by pointing out that macrofinancial coherence and “robust” financial governance are essential dimensions of such alternative framework – although under researched -for understanding development trajectories.

Resumo

O trabalho sugere quatro pontos para discussão. O primeiro é que divergência e não convergência – tecnológica ou de trajetórias de desenvolvimento – é a norma na história do desenvolvimento, e um fenômeno especialmente visível no último século. O segundo é que convergência e “catch-up” são, de uma perspectiva calcada na concorrência Schumpeteriana, conceitos teoricamente inadequados para explicar as referidas trajetórias na medida em que ambos implicam uma espécie de “equilíbrio imposto à história”. Em terceiro lugar, propomos de forma compacta os contornos de uma abordagem analítica centrada no conceito de *leapfrogging* (ultrapassagem) pela via das inovações. Por fim, o trabalho salienta a importância da Macrofinança – em particular a estrutura do sistema financeiro, sua relação com os processos de financiamento e com a governança financeira – como elemento tão importante, ainda que pouco pesquisado, quanto as variáveis tecnológicas nas teorias do desenvolvimento, quando se trata de explicar trajetórias bem sucedidas.

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¹ Professor of Economics at the State University of Rio de Janeiro, Brazil.

² Professor of Innovation Policy, Tallinn University of Technology, Estonia.

1. Introduction

Mainstream development theories differ in many ways.³ However, they share two key assumptions, which are adopted by most policy makers and embed the “governance” of trade, knowledge and finance under the WTO treaties and its multiple descendants. The first assumption is that all economic activities (or all innovations) have inherently the same growth inducing potential and, secondly, that free trade is the best regime for enabling all countries to scale up their comparative advantages and develop. The implication of those assumptions is clear: In essence, under a free trade regime, eventually all countries should converge around a certain level of development, provided that they have “law and order”, and “save” in order to be able to invest. Yet, there is growing evidence both from heterodox and (discontent) neoclassical economists that at least the convergence corollary – that however long it make take, eventually all development is toward a shared equilibrium – is in fact not what the data shows us. (See, e.g., Ocampo, Kregel and Griffith-Jones 2007, Reinert 2007, and Rodrik 2007). There are some well-known examples: measured in 1990 international dollars, South Korea had in 1950 almost exactly the same GDP per capita as an average African country (around 860 GK dollars); by 2012, the difference was twelve-fold.⁴ However, diverging fortunes between regions (such as Africa vs. East Asia) and within regions (such as Sweden vs. Greece) seem to be rather the norm in the international economy.

This paper aims to show that, if we use a Schumpeterian approach to understand and analyze development processes, *divergence*, not convergence should be the expected outcome. In other words, differentiation, not homogenization, is the result of Schumpeterian competition and is in fact an essential dimension of capitalist evolution. It is easy to translate that perspective into a Hirschmanian parlance labeling it as development as an un-balanced growth process (Hirschman 1958; Adelman 2012). In fact, the policy take away we offer is that promoting economic development requires very distinctive policy tools as well as continuous, evolutionary, institutional reforms. A key point of the paper is that the theoretical backing for this policy perspective is that successful economic development involves a leapfrogging process – a straightforward dimension of Schumpeterian competition – rather than a path towards of convergence or catching up. In other words, development, both successful or not, is not a continuous but rather an abrupt and conflict-prone process.

More precisely, the paper 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 conceptualize development trajectories; and that this is especially visible in the last half a century. Second, the paper suggests that “convergence” and

³ The authors are grateful to Erik S. Reinert and L. Randall Wray for their comments on an earlier draft of this paper.

⁴ The Conference Board and Groningen Growth and Development Centre, Total Economy Database, extracted March 2012, <http://www.conference-board.org/economics/>.

“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, the paper outlines this Schumpeterian framework, centered on the concept of leapfrogging through innovation, as a more promising way to address both development theory and the historical trajectories observed since the industrial revolution in Britain. Finally, the paper points out that macrofinancial coherence and “robust” State-led financial governance are essential – but underdeveloped – dimensions of such an alternative framework for understanding development trajectories.

In that 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, Hyman Minsky and Jan Kregel. Keynes introduced money and financial market’s expectations 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, 2010, Kregel and Burlamaqui: 2005).

The novelty here is not “financing for development”, but *macrofinance*: the way the financial system works and how it should be structured and governed to effectively foster innovation and development. We use this body of work to attempt a bridging process and propose that successful *development as leapfrogging processes* are coupled with financial structures and financial governance that enable particular countries and their technological and innovation capabilities to engage in a strategy of *following as a prelude for surpassing*.

A core point we are making here is to suggest, following Minsky, that capitalism is essentially a financial system (which may deteriorate into a collection of ‘Ponzi Nations’, as it did in 2008). But we are also adding the Schumpeterian dimension, by pointing out that under certain institutional and financial arrangements, not fully understood yet, it 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 policymaking 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 Hikino and Amsden have submitted as a “new learning paradigm” to assess late industrialization. (Cf. Hikino and Amsden 1994). However, 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 we are not claiming to have invented this analytical framework, we are just borrowing from Schumpeter, Keynes, Minsky and Kregel and, maybe, doing – at most – some creative adaptation.⁵

2. Converging policies, diverging trajectories

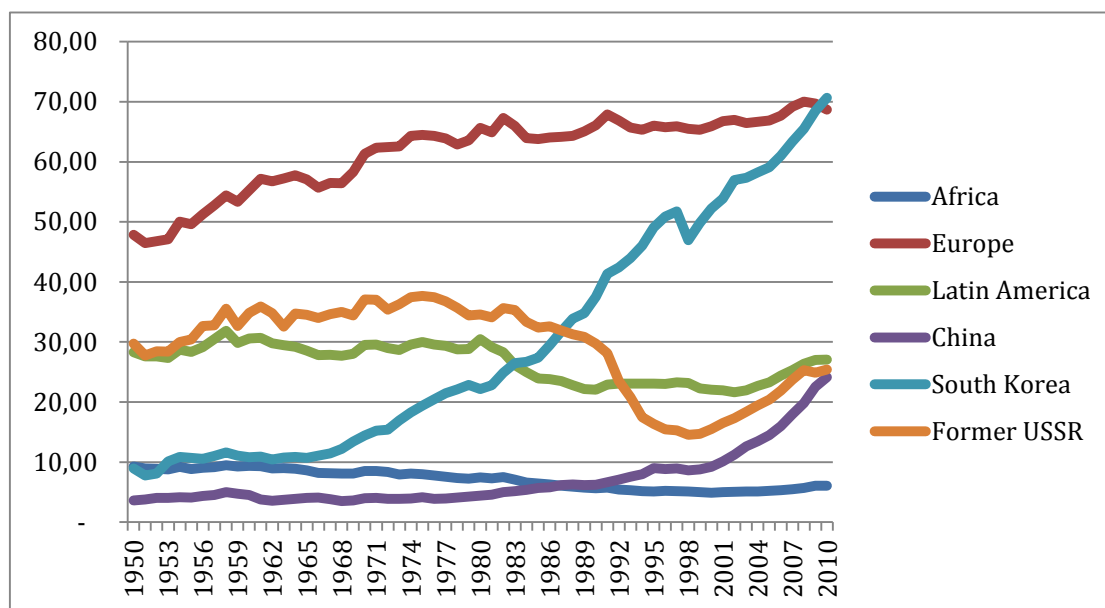
Since the advent of WTO agreements in 1990s, we witness, globally, a growing homogeneity among economic policies used for development. While emulation of successful policies is historically nothing new (E. Reinert 2009a, S. Reinert 2011), WTO and its descendants (e.g., bilateral agreements) assume universal rules and institutions that should be more or less precisely copied by the developing countries. All these agreements internationally regulate areas that were previously typically left to countries themselves to govern.⁶ Consequently, what we witness during past 20 years is a strong convergence in formal policies – from patent policies to financial regulation. (See also Karo and Kattel 2010) However, this increasing policy convergence leads, not surprisingly if looked from the perspective we are suggesting, to diverging economic fortunes. In what follows, we do not intend to give an exhaustive empirical overview of divergence; rather we offer only snapshots of development trajectories, but hope this extremely condensed discussion suffices to query 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 all development processes should convergence and catch up towards, 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 onset of WTO, divergence between regions and between countries has in fact become much more pronounced.

Figure 1. GDP per capita as a % of US GDP per capita, 1950-2010, regional simple averages, in 1990 GK\$.

⁵ Furthermore, 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 departing point because in our understanding he provides the best combination between a bird's eye view of capitalist dynamics – combining economics, sociology, politics and culture – with a permanent quest for theoretical and analytical deepness.

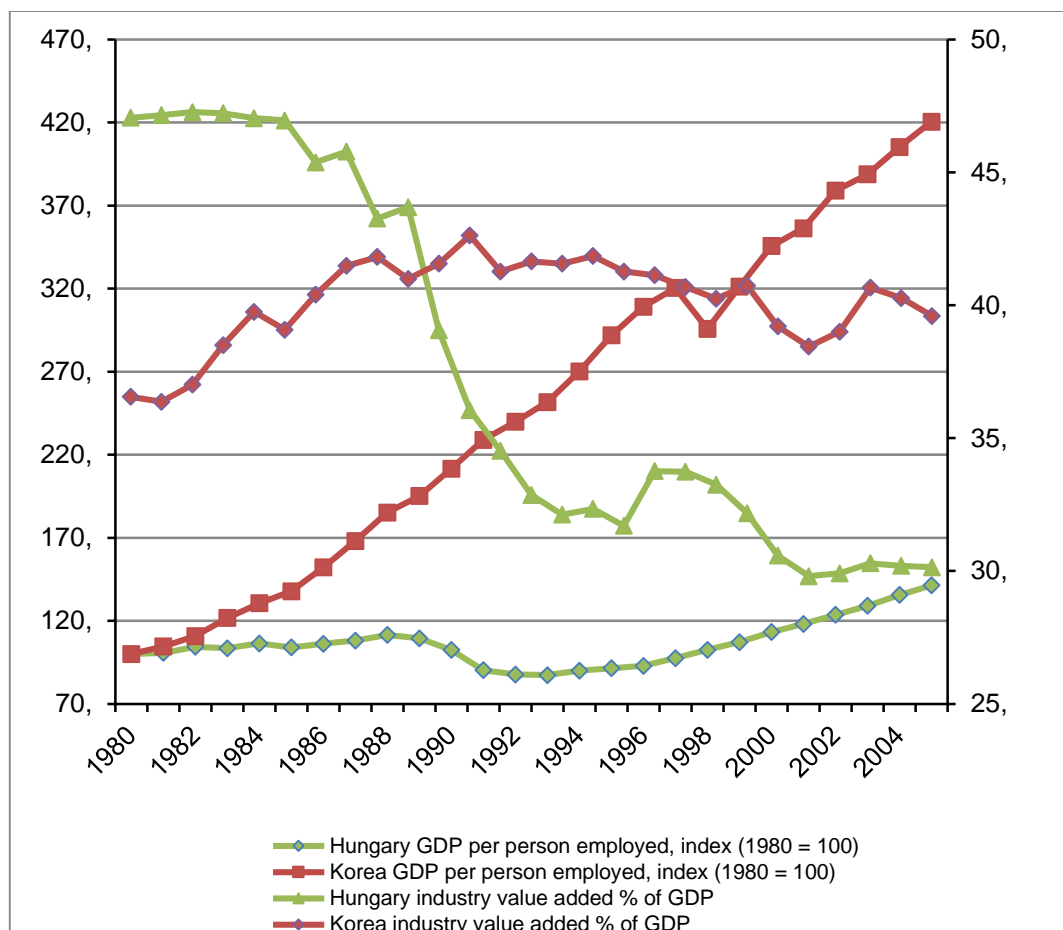
⁶ Many heterodox economists have discussed the impact of WTO on development; thus, e.g., Wade 2003, Gallagher 2005, Shadlen 2003 and 2005, Correa 2000, Li and Correa 2009, and Thrasher and Gallagher 2008 offer useful summaries of these discussions.



Source: The Conference Board and Groningen Growth and Development Centre, Total Economy Database, extracted March 2012, <http://www.conference-board.org/economics/>; calculations by the authors.

Indeed, we see impressive success stories such as Japan, South Korea, Taiwan and Singapore, that have not only caught up with Western Europe and US but, 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 Soviet Union. In particular the latter region, Eastern Europe and former Soviet republics, experienced massive changes in 1990s and fell rapidly behind East Asian economies that were substantially less developed and poorer only a few decades earlier. As Guerrieri argued already in 1998 – 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, 20) While Eastern European share in world trade grew from 0.73% in 1980 to 0.95% in 1995, East Asia’s share grew in the same period from 3.80% to 10.83%. (Guerrieri 1998, 29) This trend is particularly pronounced for science-based industries: Eastern Europe’s share grew from 0.29% to 0.39% in the period from 1980 to 1995; East Asia’s share grew from 4.83% to staggering 17.82%. (1998, 38) One can argue that the transition of Soviet Union was particularly badly managed process were looting and theft were the norm. Furthermore, if we look at Eastern European countries, such as Hungary, early transition success story with high levels of FDI and high technology exports, we still see a surprisingly similar picture. Figure 2 depicts South Korea’s and Hungary’s highly diverging fortunes during 25 years since 1980. While South Korea’s GDP per capita more than quadrupled during this period, Hungary rapidly deindustrializes and her GDP per capita barely raises above the 1980 level by 2005.

Figure 2. East Asia (Korea) vs Eastern Europe (Hungary): GDP per person employed, index (1980 = 100) (left axis) and industry value added as % of GDP (right axis).



Source: World Bank WDI Online database.

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 accumulating divergence. As Nee 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”. (2007, 6) 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 percent of poverty reduction in the developing world from 1990 to 2000. China’s explosive economic growth has shown to have self-sustaining momentum. By 2040, *The Economist* (16 September 2006, 10) predicts China will 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.

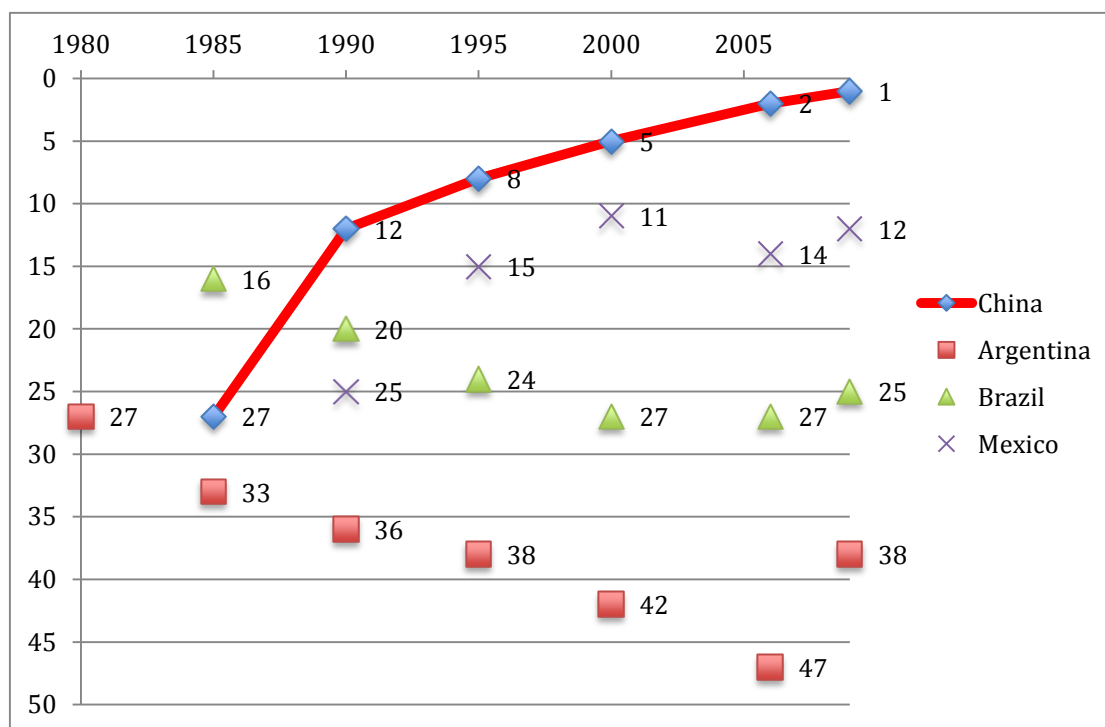
A comparison of Asia and Latin America leads us to similar results: no convergence or catching up, but another case of continuous divergence. In a recently published book on the subject, Kevin Gallagher and Roberto

Porzecanski, using China as a proxy for East Asia, succinctly illustrates 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. (2011, chapter 1)

Table 1 exemplifies divergence between China and Latin America as measured in their respective shares in world's manufacturing exports: China's share keep climbing, while most of Latin American countries see their shares diminish.

Table 1. Climbing up and down the ladder: country shares in world manufacturing exports, 1990-2009, listed as positions among top 50 exporting countries.



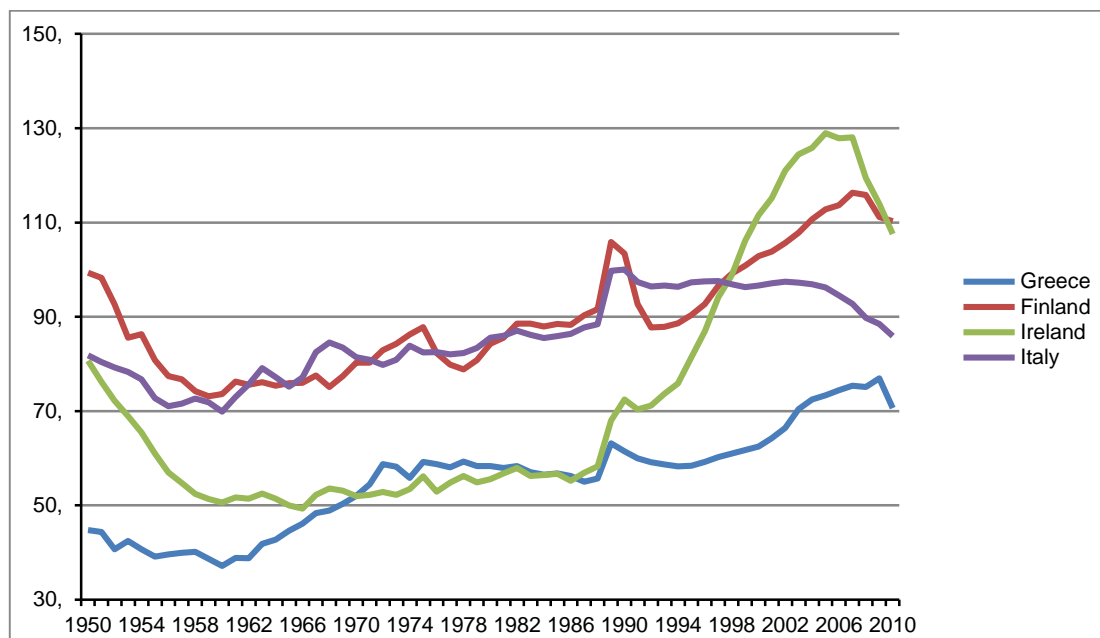
Source: Data drawn from Gallagher 2011.

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

However, convergence does not describe development trajectories among highly developed nations either. If we look at dynamics of income growth among European nations since 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 others such as Italy and other Southern European economies are falling behind, in particular since the single market came to force in Europe in mid-1980s.

Figure 3. GDP per capita of selected European countries as a % of German GDP per capita, 1950-2010, regional simple averages, in 1990 GK\$.



Source: The Conference Board and Groningen Growth and Development Centre, Total Economy Database, extracted March 2012, <http://www.conference-board.org/economics/>; calculations by the authors.

Consequently, it is safe to assume that there are different dynamics going on among nations rather 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: in fact what happened in the comparative histories of industrialization in Britain, USA, Continental Europe (especially Germany) and Japan was creative destruction and leapfrogging, not catching up or convergence: a succession of episodes of corporations, industries and countries – but especially corporations and industries – overtaking others and becoming leaders. Thus, for instance, by introducing new methods of production, organization, financing as well as new institutional arrangements, Germany managed – around the turn to the 20th century – to surpass Britain in steel, chemistry, electricity, big pharma, investment banking and corporate-based research (Landes 1969, Watson 2011).

Similarly, what Japan did, in fact, was to introduce, 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 1980s. Its 1990’s financial bubble 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 it to at least for some time leapfrog and surpass technologically, rather than converge with, most of the developed world (Vogel 1979, Johnson 1982, Dore 1987, Fruin 1992, Studwell: 2013).

Conceptually speaking, this is precisely what Britain, Germany, and the US had done before. Leapfrogging through powerful paradigm and/or frontier changing innovations, not convergence or catching up. (Perez 2002) The theoretical framework best suited to understand these processes is, we argue, Schumpeterian: *Schumpeterian 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 the other, 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. Largely, these theories can be divided into two large schools of thought: first, theories that explicitly or implicitly assume that nations will eventually convergence towards an equilibrium; second, theories that understand international economic development through stages.

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 the productive structures. Essentially, for these theories, development is a matter of copying best practice solutions and about getting the institutions right for such copying. (See also Boyer 1993) Convergence theories assume, in sum, that there is one best way of capitalism (in terms of technological, organizational, financial etc capabilities exhibited by leading firms) in any given point in time and that countries will converge towards this best way and equilibrium. Policy and institutions, including international trade agreements, foster movement of all countries towards such equilibrium, or are hindrance to expected convergence.

Stage theories of development,⁷ on the other hand, assume a variety of economies, but the same “route”. They fall into two large categories: first, static theories that are mostly interested in how various stages of development differ from each other drawing on history (institutional underpinnings, social and political features, etc) and, second, technologically rooted stage theories that are mostly interested how and why countries pass from one stage to another – and, importantly, may also fall back. In particular

⁷ Reinert 2009b is an invaluable discussion of economic stage theories.

within this latter group of theories, we find concepts and frameworks that help to understand how countries tend to follow similar “techno-economic paradigms” but not necessarily end up converging towards a frontier.⁸

As for catch-up, it seems to be one of those “general purpose concepts”, given the multiple uses it allows. In a recent book, Nelson, Odagiri, Goto and Sunami⁹ provides 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”. In addition: “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” (2011, 2-3).¹⁰ 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 that point even before introducing the concept: “To be sure, some countries did catch-up and some even forged ahead. Some, however, actually fell behind” (2011, 2).

This imprecision seems to create a conceptual problem: is catch-up a *tendency* (an “evident fact”) or a *possibility* (some achieve it, some do not) for late developers? Furthermore, catching-up seems to imply “*convergence*” (narrowing the income gap) and, apparently, 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 to Alexander Gerschenkron is due. Gerschenkron, the doyen of economic history in the United States during the fifties and sixties, was a *product* of the same milieu Schumpeter has lived, 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:

⁸ Varieties of capitalism literature could be seen as a sub-form of stage theories, only in this particular framework multiple forms of capitalism are not following each other but rather co-exist as multiple “best practices” in parallel.

⁹ Who have worked extensively on the subject (Nelson in particular).

¹⁰ By “narrowing the income gap”, should we understand total GDP, in which case, according to the World Bank Fact Book, Brazil and China are ahead of Sweden and Switzerland, Taiwan comes in as number 24th and Denmark as 31st? Or GDP per capita, in which case (also according to the WB) Qatar, Bermuda, Brunei and Kuwait would have surpassed the US, Germany and Japan comes in as 31st and 32nd respectively and China and Brazil are way behind the United Arab Emirates and Greece? As for “technological catch-up”, how do you measure it? How far are China, India and Brazil from the “frontier”? How close is the UK (which produces and exports services, especially financial services)? Productivity and *changes in productivity* might be a better way to look at the dynamics of development trajectories among industries and nations¹, keeping in mind the nation is a very problematic unit of analysis anyway. Furthermore, narrowing the income gap is a possible result, not a given, but divergence, not convergence, a more likely outcome.

1962: chapter 1) puts him far away from stages theories a la Rostow, and brings him very close to our proposed “leapfrogging hypothesis”. In his 2001 review of the classic book, Fishlow provides a 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 (2001: p 1).

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.

Let us conclude this section by re-stating one of our initial points: “convergence” and “catch-up” are rather loose ways (or concepts) to frame development narratives and more akin to the idea of a tendency towards equilibrium imposed on history. After all, what it really says is 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. Development Theory as Schumpeterian Competition: Leapfrogging by means of Innovation

Economics as a scientific discipline starts with development-oriented questions, such as why some cities, like Venice, surged ahead while others, like Naples, fell behind. In that regard, Antonio Serra’s 1613 highly significant treatise, titled as *A short treatise on the causes that make kingdoms abound in gold and silver even in the absence of mines, with particular reference to the Kingdom of Naples* should be taken as a well-argued starting point. It is no coincidence that Schumpeter greatly praised Serra since he defined capitalism as a process grounded on wealth creation (of new things ‘competing old things out of existence’ – 1939, 228). To that matter, his, perhaps, oversimplified reflection of Sombart and Weber is telling: Schumpeter argues that it makes no sense to look for a new spirit or new rationalism in order to “decode” capitalism, it is rather the process by which capitalism incessantly moves forward – innovations and their impact on

competition – that economists should try to understand.¹¹ (Schumpeter 1939, 227)

Furthermore, Schumpeter's theory of innovation is an application to economics and business of his wider theory of how evolutionary change takes place in societies (see Andersen 2009). In his 1939 *Business Cycles*, Schumpeter states, in a footnote, 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." (1939, 97)

His 1912 *Theorie der wirtschaftlichen Entwicklung / The Theory of Economic Development*¹² assumes apparently 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*. Persons, or "new men" as he called them in 1939, or organizations which became his focus in 1942, that look for "new combinations", innovative solutions and bring forth evolutionary changes: entirely new ways of doing things (in business, politics, art, science, etc) that will spread, in some cases more than others, throughout the given sphere of life.¹³ Some of these changes will change value systems and disrupt incumbent hierarchies.¹⁴

In the seventh and last chapter of this book¹⁵, summarizing his argument, Schumpeter argues that innovations as new combinations ("neue

¹¹ Here it is worth mentioning that Schumpeter was probably not familiar with Weber's mature assessment of Capitalism's origins, his 'last theory of Capitalism'. This approach, developed in his book *Wirtschaft und Gesellschaft*, published in 1922, is far more sophisticated and institutionally complex than the better-known version delivered in "The Protestant Ethic and the Spirit of Capitalism".

Schumpeter's criticism would not fit the 1922's version. See Collins 1986 for a brilliant discussion of Weber's "last theory". As for Sombart, a proper analysis of his *theory* is still needed (see H. Reinert and E. Reinert 2006 for an important discussion of the idea of creative discussion in Nietzsche, Sombart and Schumpeter).

¹² We use here the German original first edition as in later editions (that served as the basis for English translation as well), these discussions were cut by Schumpeter; so, e.g., 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.

¹³ "Das erste Moment, die Freude am Neugestalten, am Schaffen neuer Formen der wirtschaftlichen Dinge ruht auf ganz denselben Grundlagen wie das schöpferische Tun des Künstlers, des Denkers oder des Staatsmannes." (1912, 142)

¹⁴ "Sie werden Neues schaffen und Altes zerstören, kühne Pläne irgendwelcher Art konzipieren und durchführen, deren Originalität aller Erfassung zu spotten scheint, ihre Mitbürger ihrer Herrschaft unterwerfen, vielleicht die nationale Politik und Organisation beeinflussen, den 'natürlichen' Gang der Wirtschaft durch gesetzliche und ungesetzliche Mittel und jedenfalls anders als durch 'Tausch' abändern uws." (1912, 157)

¹⁵ Translated into English only in 2002 in a special issue of *Industry and Innovation*.

Kombinationen”) form the internal dynamics of an economy that break the economy away from existing paths into new directions and force thus firms, individuals, and eventually institutions to adapt; for Schumpeter, such dynamics define the form of the economy (“Wirtschaftsform”). The key point is that in both passages what emerges, as fundamental outcomes are *disruptions and dislocations*, 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], part 2). 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 and productivity enhancement. Very importantly though, neither the process nor the outcome – successful innovations and structural change – are granted. For each Thomas Edison, Henry Ford or Steve Jobs, there are hundreds of failed attempts that end up in bankruptcy courts. Divergence again. It is important to note that such Schumpeterian divergence is a powerful force of changing economic behavior of individuals and firms. In one sentence: Schumpeterian divergence which 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. Further, the innovation process is ceaseless – but not success. 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 (think how today almost every serious IT and/or electronics company tries to enter iPad market). However, success is not achieved through a one size fits all formula. It, rather, engenders massive asymmetries as it generates positive feedback from markets to producers, which translates in different competitive strategies for some and bankruptcy for many.

Firms thus compete continuously for market niches, with asymmetric results: success for some, with strengthened technological, organizational, or legal¹⁶ capabilities, and above-average (their own) past profits; failure for other firms, which either disappear or are reduced to marginal activities – or move into other business segments. Schumpeter put it as follows: “to escape being undersold, every firm is compelled to follow suit, to invest, and to accumulate” (Schumpeter 1942 [1992], chapter 3, 32). 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 – but rather to continuous technological, organizational and legal change, financial innovation and differentiation; and temporary monopolization of market opportunities.

¹⁶ Such as patents, copyrights, trademarks and a whole host of intellectual property-based monopolies.

For instance, while in 1920s radio industry was one of the most dynamic industries, nobody would consider radios a dynamic sector in 2013. Yet, creative destruction processes (evolution of technological, organizational, financial, institutional capabilities) started by RCA in 1920s – leading radio manufacturer of the time – created, in succession, black-and-white and color TV industry, that in turn revolutionized news and entertainment businesses, and were instrumental in development of VCR and computer businesses, that in turn led to internet, mobile phone, and social networking. Along the way, US lost almost all capabilities to produce any consumer electronics, but of course, it gained leading positions in today's dynamic industries, such as internet search and social networking. (See Chandler 2001)

In other words, creative destruction processes bring forth not only technological changes at company level, and are not restricted to a sectorial 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 (Landes 1969, Chandler 2001, Perez 2002). In one sentence: 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.

Google, Apple¹⁷ and Amazon provide us with clear examples of our main proposition. Those companies have changed the way we organize our daily activities as trough successful "gales of creative destruction". Technological, organizational, spatial, legal, financial and strategic. The full Schumpeter catalog. Most importantly, however, they didn't "catch-up. They leapfrogged their competitors and **redesigned the "frontier"**. They have revolutionized entire industries and became dominant players on a global scale in a very short period of time (Levy:2011 , Issacson:2012, Stone:2013) Obviously, these socio-economic changes are not bound by national borders. However, the nature of trade regulations and agreements makes a huge difference on how creative destruction works out in a given country, and this should be perhaps a key theme in a development agenda for the twenty first century. To conclude the section, let's state the following: leapfrogging processes not necessarily depend on, or spring from, groundbreaking scientific advances. Their kernel is the strategic use of both old and new technologies in creative ways. That requires finance and 'productivity-oriented' financial governance.

5. Leapfrogging and Finance in Schumpeterian Development Processes

Schumpeter's theory of economic development stands on two pillars: innovations that increases productivity in production and finance that supports these innovations. Briefly summarized, 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

¹⁷ Or Baidu, Google's main rival – and monopolist – in China.

not deal in detail with finance; in particular, he did not look at the financial system as a system that is, similarly to production system, based on innovations. Here, enters Minsky. Bankers as much as industry captains are innovators, and both sides of the economy, finance and production, are intimately linked through corporation's balance sheets. The inherent uncertainty (liabilities to set up or upgrade production and/or innovate) faced by firms in a competitive environment is reflected in their financial asset's prices, 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, 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" (Minsky 1982, 63).

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 the 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 which direction financial sector innovates.

As Minsky and Kregel have shown, over the past decades 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. To meet this shortfall in earnings commercial banks have been forced, by competition, to innovate. To enter into other areas of activity, such as the provision of financial services in order to generate fee and commission income, by "over-leveraging" their proprietary trading in financial assets, and towards "reckless" innovations such as credit default swaps and all sorts of betting techniques with no relationship with productivity increases whatsoever (Kregel 1998, 2001).

This – *bad finance* – is a potential outcome essentially missing from Schumpeter's framework. It is here where both Minsky and Kregel made their mark. Moreover, it is here, that the concept of "robust financial governance" finds meaning. 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. Jan Kregel's

contribution in that realm was to show that the way financial sector is organized and governed is a core dimension of any development process.

Kregel provided us with robust analyses of the dysfunctional impact that unsound financial governance has on development, innovation and on leapfrogging processes. Demonstrating that a Minsky crisis happened in East Asia, describing the role of derivatives in amplifying it and by analyzing the US sub-prime crisis as a Ponzi scheme *from the very beginning* (with no evolution from hedge and speculative phases), he linked finance to *regressive* development .

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

Thus, while Minsky showed that the structure of an economy consists of units with different balance sheets (hedge, speculative and Ponzi) that mirror the macro-financial evolution; Kregel has analyzed 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). Furthermore, Kregel has also underlined how reliance on foreign financial flows, in particular in form of short-term financial flows, tends to drag countries into Ponzi schemes (Kregel 2001, 2004).

Summing up, what Minsky and Kregel have shown is that Schumpeterian competition has to be supplemented by an evolutionary 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 issue 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).

5. Conclusion

Schumpeterian competition – creative destruction by means of innovation – is a permanent leapfrogging process where forging ahead and falling behind are expected (predictable) results. Moreover, leapfrogging processes are not technology-driven neither techno-institutional constructs. They are outcomes of virtuous feedbacks among 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 where there are hardly any “best practices”, since they are continually challenged by innovations and where imitation is often “creative”. Financial structures and financial governance are still largely absent of that framework, but we hope to 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 paper.

To conclude, we leave the reader with our title question: convergence, catch-up or leapfrogging and finance, which is the best way to approach development history in general and, especially, the trajectories of “late developers in the last three-four decades? By now, you know our answer.

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