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**The institutional challenges to the labor market and the fourth industrial revolution in the light of a new paradigm in economic thinking:
the Brazilian case**

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Special thanks for:



and





1) Introduction

- i) the fast technological changes of the 21st century are structurally affecting the world of work, in terms of risks and possibilities;
- ii) Brazil does not present a proper strategy for coping with this reality;
- iii) objective of the paper: to examine the progress of 4IR in developed and developing economies and their impact on the Brazilian labor market;
- iv) heterodox approach of the economy: Chang's Institutional Political Economy and NET, combining it with conceptual, statistical and analytical studies of international, regional and national organizations.



2) institutions, technology and the world of work: NET

2.1) Chang's Institutional Political Economy:

i) How have countries become developed? (CHANG, 2003a);

ii) the – formal and informal – institutions are “devices which enable the achievement of goals [and are] constitutive of the interests and worldviews of economic actors” (CHANG & EVANS, 2005, p. 101);

iii) markets, firms and the State are essential institutions to the functioning of the capitalist system and complex societies cannot rule out any of them (CHANG, 2003b).



2) institutions, technology and the world of work: NET

2.2) Chang's approach and its connections with a human-centered and sustainable development framework:

- i) it is essential the refoundation of socio-economic theory in order to provide new perspectives for the establishment of adequate and effective institutions (JACOBS, 2015, HOEDL, 2017);
- ii) global and national multidimensional requirements of the 21st century, with a view to improving the general living conditions of people in general;
- iii) the economy is strongly influenced by political and social power and vice versa (JACOBS, 2017).



2) institutions, technology and the world of work: NET

How to reconcile the premises of Chang's Institutional Political Economy linked to a NET paradigm with the rapid structural changes underway, specifically facing the actual technological and world of work scenarios?



3. The 4IR: structural change and its magnitude

- i) 4IR: characterized “by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres” (SCHWAB, 2016a);
- ii) the 4IR expression appeared worldwide in the Hannover Fair 2011 meeting (German government’s – State policy);
- iii) it will impose on emerging countries – the case of Brazil – to rethink their strategies and development models;
- iv) the greatest socio-economic threat that 4IR could cause is a dynamic of plays of the type everything to the winner between countries, generating overall insufficient demand for work or labor skills available.



4. Labor market 4.0: the juxtaposition of structural changes

- i) the most visible disruption caused by technological structural change will fall on the world of work (The Future of Jobs Report, WEF, 2016a);
- ii) until 2020: the (net) elimination of more than five million jobs;
- iii) about 65% of children currently entering primary school will work in activities that do not yet exist;
- iv) fifteen advanced and developing countries will be hardest hit by 4IR, among which Brazil ranks fifth;

4. Labor market 4.0: the juxtaposition of structural changes

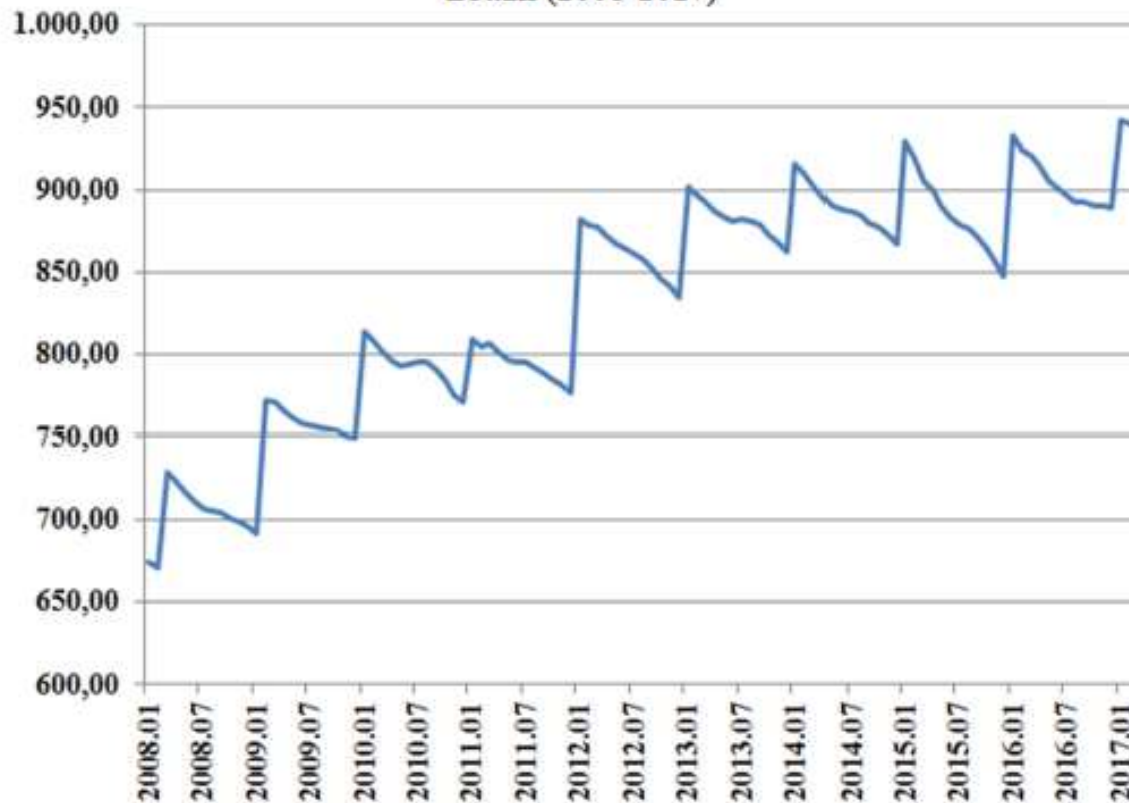
Main concerns about the Brazilian labor market:

- i) jeopardizing the centrality of the work as the engine of the development;
- ii) a large part of Brazilian society still does not have access to the most advanced technologies;
- iii) the risks of 4IR is to reduce the capacity to stimulate development combined with social equity and decent work , limiting the construction of a development model with national sovereignty (heterodox approach);

5. Brazilian labor market in the context of 4IR

- i) unemployment: about 13 million people;
- ii) real wage: accumulating losses since 2017;

Graphic 1 – Minimum real wage (in constant RS of January 2017, deflacioated by INPC)
Brazil (2008-2017)



Source: IPEADATA, 2017. Elaborated by the authors.



5. Brazilian labor market in the context of 4IR

iii) R&D: in a universe of 127 countries, in 2016 placed Brazil in the sixty-ninth place (CORNELL UNIVERSITY, INSEAD & WIPO, 2017), the last position among the “BRICS” and behind many countries of Latin America;

iv) Brazilian government investment: the proposal (Encti, 2016) was to invest 2% of the national GDP in R&D by 2019. By the last available data, R&D investment in the country was only 1.24% (WB, 2017);

5. Brazilian labor market in the context of 4IR

v) patent applications:

Table 2 – Total Patent Applications (in units) – BRICS – 2008-2015

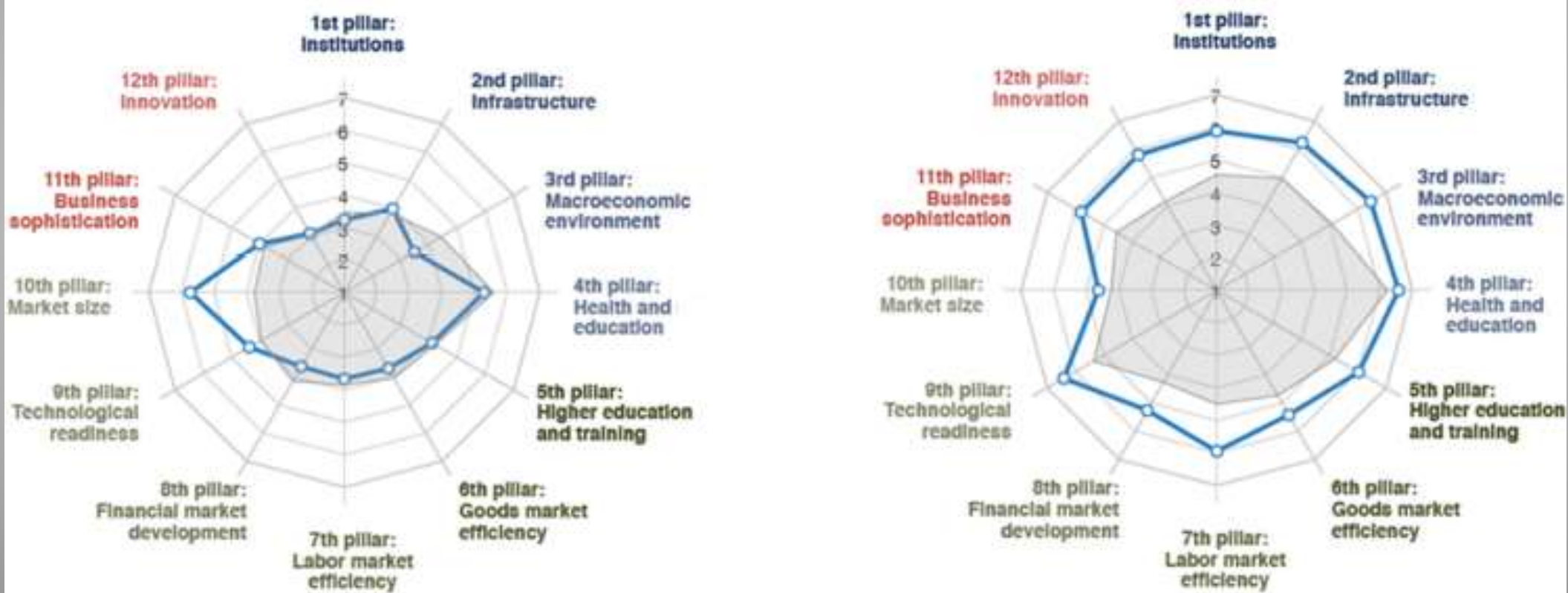
Country	2008	2009	2010	2011	2012	2013	2014	2015
China	289.838	314.604	391.177	526.412	652.777	825.136	928.177	1.101.864
India	36.812	34.287	39.762	42.291	43.955	43.031	42.854	45.658
Russia	41.849	38.564	42.500	41.414	44.211	44.914	40.308	45.517
Brazil	23.170	22.406	24.999	28.649	30.435	30.884	30.342	30.219
South Africa	7.941	6.735	6.393	7.245	7.444	7.295	7.552	7.497

Source: Extracted from *WIPO statistics database*, 2017. Elaborated by the authors.

5. Brazilian labor market in the context of 4IR

vi) Global Competitiveness Report 2016-2017 (GCI) (WEF, 2016c): Brazil - 81st/138 countries.

Figure 1 – Global Competitive Index 2016-2017



Brazil versus Latin America and the Caribbean

Switzerland versus Europe and North America

Source: International Monetary Fund; World Economic Outlook Database, 2016. Extracted from WEF, 2016c.

5. Brazilian labor market in the context of 4IR

Challenges:

- i) technological catching up: it is urgent that Brazil accelerate the step in the quantitative and qualitative development of knowledge;
- ii) the creation of a virtuous circle between 4IR and the Brazilian labor market, which will require:
 - internally: a (re)structuring agenda of the Brazilian labor market, with institutional improvements in the labor sector, deepening of tripartite dialogue, with an active social and political character;
 - externally: the most important aspect is the progressive involvement in the various international and regional development agendas, such as ILO and ECLAC.



5. Brazilian labor market in the context of 4IR

Possibilities:

Brazil need to embrace its concrete possibilities, recognized worldwide in several documents and reports analyzed in this research:

- i) a big internal market;
- ii) its potential in agriculture and correlated;
- iii) its faculties in environment and renewable energies.

These characteristics need to be better exploited, becoming the propulsion of the jobs of the future for the Brazilian labor market, enabling sustainable socioeconomic development with equity, in close association with technology.

It can be done taking into account Chang's approach
and the need to rethink Economic Sciences.



6. Concluding remarks

- i) the economy and global society are at a crossroads, in what concern potentials and risks of the 4IR. The humankind will need reflection and action;
- ii) it will impose on Brazil in general – and its labor market in particular – to rethink its strategies and sustainable development models;
- iii) it will be necessary to progressively improve the regulation and global governance (of work) and also greater social and political power of Brazil. International institutions have a key role to play in this regard;
- iv) attention must be paid to Chang's approach, linking it to the construction of a new paradigm in economic thinking, human-centered, as an alternative to overcome this historical challenge.



Thank you!

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