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From our perspective

Technological development and protest waves: Arab spring as a trigger of the global phase transition?

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ABSTRACT

There are grounds to conclude that in 2011–2012 the World System experienced to some extent a phase transition to a qualitatively new state of global protest activity. This phase transition is shown to bear some resemblance to the one which the World System experienced in the early 1960s. The first (after 1919) phase transition of this sort occurred in the early 1960s and was related to the growth of global informational connectivity after World War II, as well as the improvement of the means of protest self-organization due to the spread of television, portable radio receivers, portable electric loud-speakers and other technologies of the Fourth Kondratieff Cycle. The phase transition of the early 2010s was prepared by a new wave of growth of global informational connectivity, as well as the improvement of the means of protest self-organization due to the spread of various technologies of the Fifth Kondratieff cycle (the Internet, satellite television, Twitter and other social networks, mobile telephony etc.). Similarly to what was observed during the Fourth Kondratieff Wave, during the Fifth Cycle while the spread of these technologies was going on for many years before 2011, their internal colossal potential for generating and spreading protest activity was realized in one leap, as a phase transition.

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In this article we will demonstrate that Kondratieff waves can be traced not only within various economic and technological indicators, but also within the global pattern of protests. What is more, Kondratieff waves in technologies appear to be tightly connected with the K-waves in global protests that in their turn are tied – through the mechanism of expectations – with the hype cycle. On the other hand, we will demonstrate that the colossal potential of relevant technologies of a particular K-cycle to generate and spread protest activities tends to be realized in one leap, as a phase transition.

In particular, we will show that the recent upsurge in the global protest activities is connected with the diffusion of the communication technologies of the fifth Kondratieff cycle. We fully agree with the importance ascribed to communication technologies – and would like to emphasize their role in shaping major manifestations of protest activity. It has already been noted that numerous events of revolutionary unrest, from the July revolution in France under King Louis-Philippe to Chinese revolts of 1989 were to a considerable extent facilitated by technological developments – everyday newspaper technology in case of the 1848 Spring of Peoples, cassette recorders in case of the Iranian Revolution, fax machines in case of 1989 China revolts and so on (for a review see [Toska, 2015: 137](#)). The technologies assumed to have played the greatest role in the Arab Spring events and their global echo include

Internet-based communication technologies (Internet sites, Twitter, Facebook groups, blogging etc.), satellite television channels (first and foremost, Al Jazeera and Al Arabiya), and mobile telephony ([Khosrokhavar, 2012: 152](#), [Brynen et al., 2012: 233](#); [Lynch, 2014: 93–110](#)). Note that we are dealing here precisely with the 5th Kondratieff Wave technologies. Khosrovakhar offers a typology of social movements as regards communication technologies they employ: pre-modern movements, “based on the transfer of information by word of mouth”; modern movements, based on print, radio, and TV; and post-electronic age¹ Net movements “based on new communication systems, with the Internet – especially Facebook, Twitter, and YouTube – playing a major role. They are gender mixed and youth oriented, as well as religiously open and politically inclusive ... They are not based on charismatic leadership or monitored by professional revolutionaries or intellectuals” ([Khosrokhavar, 2012: 150–151](#)).

The world in general and the Arab world in particular were experiencing an unusually intensive surge of protests in 2011–2012. The Middle East (especially the Arab countries) contributed the major part of this surge in 2011. Although the protests in Algeria began earlier, it has already become a traditional practice to start the description of the Arab Spring events from December 17th, 2010, when the young

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E-mail address: akorotayev@gmail.com (A. Korotayev).¹ Though it appears more correct to denote this age as “digital electronic” (corresponding to the 5th K-wave) rather than “post-electronic”, while the previous age can be called the “age of analog electronics” (corresponding to the 4th K-wave).

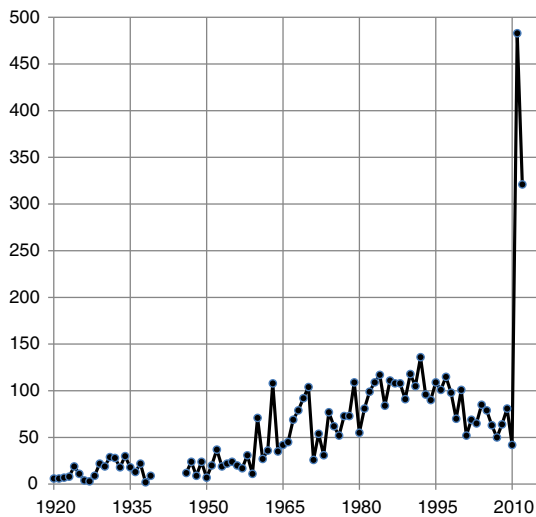


Fig. 1. Dynamics of the total number of major antigovernment demonstrations registered in the world annually as recorded in the CNTS database (1920–2012). Cross-National Time Series Database. This figure has been made by Elena Slinko. Data source: (CNTS, 2015).

unemployed Mohamed Bouazizi committed self-immolation in the provincial Tunisian town of Sidi Bouzid. The rising wave of protests resulted in an unexpectedly rapid fall of the Ben Ali regime primarily due to the revealed intra-elite conflict between the non-privileged army and the privileged security forces who were under the special care of the President (see, e.g., [Nepstad, 2011](#)). As a result, the army sided with the protesters, which determined the fall of the authoritarian regime in Tunisia. This surprisingly quick (and rather bloodless) fall of the authoritarian regime of Ben Ali pushed the secular leaders of youth movements in Egypt to attempt to organize (with the widespread use of social networks) large-scale protests in their country. Due to considerable internal stress in Egypt (see, e.g., [Korotayev and Zinkina, 2011](#); [Grinin et al., 2015](#); [Korotayev et al., 2016](#)), this attempt caused an avalanche that led to the fall of Mubarak's regime. All of the above raised a wave of destabilization throughout the Arab world (the signs of which, however, were already visible immediately after the quick victory of the Tunisian revolution). The scale of destabilization in specific countries depended primarily on the extent to which there were present the appropriate conditions, such as internal elite conflict, intermediate regime type (half-democratic/half-authoritarian), the presence of disadvantaged groups (except guest workers), a high proportion of unemployed young people (especially with higher education) and so on (see, e.g., [Goldstone, 2011, 2014](#); [Beck, 2014](#); [Lang and De Sterck, 2014](#); [Korotayev et al., 2011a, 2011b, 2013, 2014](#); [Grinin and Korotayev, 2011, 2012](#); [Moore, 2012](#); [Weyland, 2012](#); [Wilson, 2013](#)).² In some cases (especially in Libya and Syria), an important role was played by external destabilizing actions.

However, the rest of the world also experienced – under the influence of the Arab Spring – a very non-trivial upsurge of protest activity

² Note that by now the synchronizing factors of the Arab Spring events have been identified as follows: (1) a high level of synchronization of processes of modernization in most Arab countries, including the simultaneous sharp drop in infant and child mortality in the 1970s–1980, against the background of the massive expansion of higher education. This has resulted in the 2000s in most of the Arab countries in the simultaneous explosion of the number of young people in general, and the number of highly educated young people in particular; (2) the synchronizing effect of the second wave of aflation (skyrocketing food prices), which peaked just in January–February 2011; (3) the synchronizing role of pan-Arab satellite channels; (4) the synchronizing role of the pan-Arab Internet ([Tsirel, 2012](#); [Khodunov and Korotayev, 2012](#); [Korotayev et al., 2012b](#); [Korotayev et al., 2012a](#); [Korotayev and Malkov, 2014](#); [Korotayev, Issaev, Rudenko, 2015](#); [Grinin, Issaev, Korotayev, 2013](#); [Korotayev and Zinkina, 2011](#); [Korotayev et al., 2011a, 2011b](#)). We would note immediately at this point that the last two factors are directly connected with the technologies of the 5th Kondratieff cycle.

as well; one can remember here the numerous “Occupy...” movements, from *Occupy Wall Street* to *Occupy Abay*.³ To sketch a brief picture of the “Occupy” protest activity in 2011–2012 and to emphasize its truly global nature, let us remember that this wave manifested itself in the USA (New York City, Detroit, Harvard University and so on), UK (London, Edinburgh, Glasgow etc.), Germany (Berlin and some other major cities), Norway (Oslo), numerous cities of Canada, Malaysia (Kuala Lumpur), Australia (Melbourne and Sydney), New Zealand (Auckland and other cities), Nepal (Baluwatar), Cyprus, Ghana (Accra), Nigeria (Kano, Lagos, Abudja), Iceland (Reykjavik), South Africa (Johannesburg and Cape Town), Japan, Russia etc. One should also remember the 15 October 2011 global protests, which were endorsed by people from dozens of countries. In addition to the abovementioned *Occupy* protests, one could recollect major protests in 2011 in Spain, Portugal, Greece, Italy, Ireland, Albania, Macedonia, Bulgaria, Georgia, Armenia, Azerbaijan, Belarus, Mexico, Bolivia, Chile, Burkina Faso, Malawi, China, India, Maldives, Sri Lanka, Iran and so on (see, e.g. [Breau, 2014](#); [Charnock et al., 2012](#); [Danjibo, 2013](#); [Erde, 2014](#); [Erdogan, 2013](#); [Fadaee and Schindler, 2014](#); [Greene and Kuswa, 2012](#); [Gunter, 2013](#); [Hoesterey, 2013](#); [Iranzo and Farné, 2013](#); [Jensen and Bang, 2013](#); [Kerton, 2012](#); [Musthaq, 2014](#); [Pickerill and Krinsky, 2012](#)).

However, the truly outstanding nature of these events is visible only with quantitative empirical data. In order to better understand the true scale of the Arab Spring and its global echo consider [Figs. 1 and 2](#):

As we see, in 2011 the level of protest activity in the Middle East experienced a staggering leap by two orders of magnitude.⁴ However, in the rest of the world the increase in the level of protest activity in 2011–2012, though not as colossal as in the Middle East, was also very impressive – it grew almost by an order of magnitude.⁵

There are grounds to assume that in 2011–2012 the World System experienced to some extent a phase transition to a qualitatively new state (let us denote it as *Phase Transition B*). This phase transition bears some resemblance to the one which the World System experienced in the early 1960s (let us denote it as *Phase Transition A*).

In [Fig. 1](#) the scale of Phase Transition A is somewhat diminished by the tremendous scale of Phase Transition B. So, in order to get a better understanding, it is reasonable to consider the same graph in logarithmic scale (see [Fig. 3](#)):

The dynamics featured in [Fig. 3](#) bears some resemblance to the dynamics of Kondratieff waves. Let us take a deeper look into this resemblance.

A Russian economist writing in the 1920s, Nikolai Kondratieff observed that the historical record of some economic indicators then available to him appeared to indicate a cyclic regularity of phases of gradual increases in values of respective indicators followed by phases of decline ([Kondratieff, 1922: ch. 5; 1925, 1926, 1935](#)); the period of these apparent oscillations seemed to him to be around 50 years. This pattern was found by him with respect to such indicators as prices, interest rates, foreign trade, coal and pig iron production for some major Western economies (first of all England, France, and the United States), whereas the long waves in pig iron and coal production were claimed to be detected since the 1870s for the world level as well (note that as regards the production indices during decline/downswing phases we are dealing with the slowdown of production growth rather than with actual production declines that rarely last longer than 1–2 years, whereas during the upswing phase we are dealing with a general acceleration of the production growth rates in comparison with the preceding downswing/slowdown period

³ “Occupy Abay” is the appellation of the Russian 2012 Occupy movement named this way because its members chose as their main meeting point a square around the monument of Abay Kunanbayev (a famous Kazakh poet) in one of the central parts of Moscow.

⁴ While in 2010 CNTS registered only 5 major antigovernment demonstrations in the Middle East, in 2011 this number rocketed up to 307.

⁵ While in 2010 CNTS registered only 37 major antigovernment demonstrations in the rest of the world, in 2011 this number increased to 208.

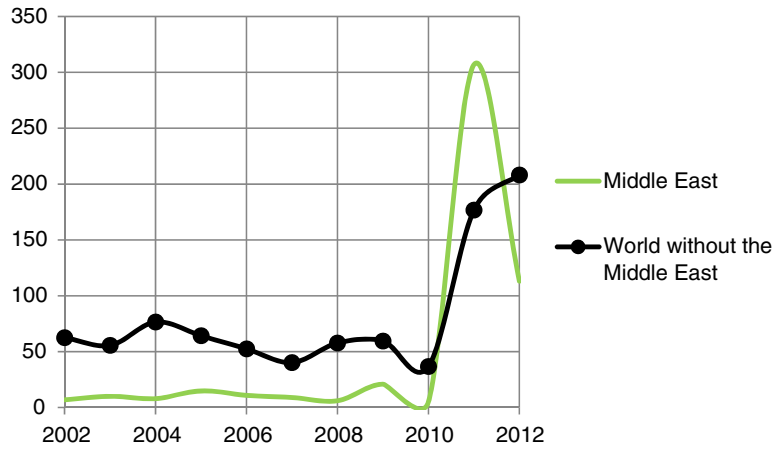


Fig. 2. Dynamics of the total number of major antigovernment demonstrations registered in the Middle East and the rest of the world annually as recorded in the CNTS database (2002–2012). Data source: (CNTS, 2015).

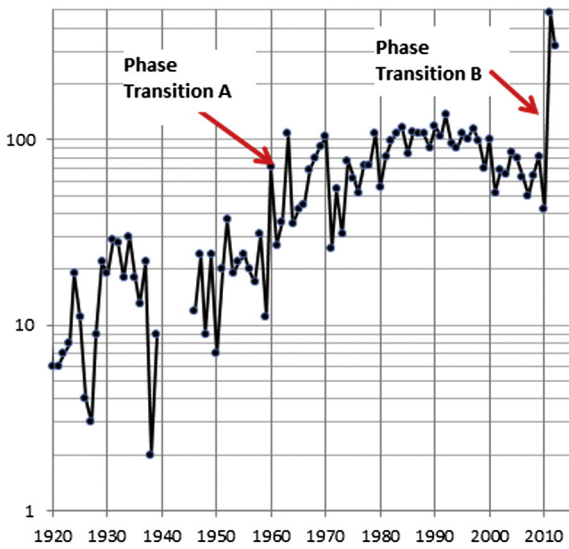


Fig. 3. Dynamics of the total number of major antigovernment demonstrations registered in the world annually as recorded in the CNTS database (1920–2012), logarithmic scale.

[see, e.g., Modelski, 2001, 2006 who prefers quite logically to designate ‘decline/downswing’ phases as ‘phases of take-off’, whereas the upswing phases are denoted by him as ‘high growth phases’].

Kondratieff himself identified the following long waves and their phases (see Table 1).

Kondratieff himself noticed that ‘during the recession of the long waves an especially large number of important discoveries and inventions in the technique of production and communication are made, which, however, are usually applied on a large scale only at the beginning of the next long upswing’ (Kondratieff, 1935: 111).

Table 1

Long waves and their phases identified by Kondratieff.

Long wave number	Long wave phase	Dates of the beginning	Dates of the end
One	A: Upswing	‘The end of the 1780s or beginning of the 1790s’ 1810–1817	1810–1817
	B: Downswing		1844–1851
Two	A: Upswing	1844–1851 1870–1875	1870–1875
	B: Downswing		1890–1896
Three	A: Upswing	1890–1896 1914–1920	1914–1920
	B: Downswing		

The subsequent students of Kondratieff cycles identified additionally the following long-waves in the post-World War 1 period (see Table 2).

One of the ways K-waves influence the social processes and shape social macro-events is through the emergence of principally new communication technologies corresponding to respective technological systems, each of which corresponds to a particular Kondratieff wave.

From our perspective, the first (after 1919) phase transition occurred in the early 1960s and was related to the growth of global informational connectivity after the World War II, as well as the improvement of the means of protest self-organization due to the spread of television, portable radio receivers, portable electric loud-speakers and other technologies of the Fourth Kondratieff Cycle (see, e.g., Transistor Radios, 1999; Arceneaux, 2014).

Even though global informational connectivity was on the increase throughout the whole of the 1950s, the growth in protest activity occurred not in a smooth, but in a sharp way in the very beginning of the 1960s. Prior to Phase Transition A CNTS records about 20 to 30 major antigovernment demonstrations annually, while in the early 1960s this rate jumps up to 100.

After that in 1964–1966 (but especially after the peak of the late 1960s, in 1971–1973) there follows a notable decline. However, by the 1980s the level of global protest activity which seemed anomalous in the early 1960s becomes quite regular.

The two decades preceding the Arab Spring were marked by a perceptible decreasing trend in the level of global protest activity; in 2010 it reached the lowest values since the mid-1970s. However, even in 2010 it was notably higher than any value recorded in CNTS before 1960.

Phase Transition B was prepared by a new wave of growth of global information connectivity, as well as the improvement of the means of protest self-organization due to the spread of various technologies of the Fifth Kondratieff cycle (the Internet, satellite television, Twitter and other social networks, mobile telephony etc.). Once again, while the spread of these technologies was going on for many years before 2011, their internal colossal potential for generating and spreading protest activity was realized in one leap.

Let us note that the spread of these technologies and the surge of revolutionary moods seem to share common pattern, which is stipulated by the dynamics of expectations:

In recent years a growing number of social science studies have pointed out the significance of expectations in science and technology innovation. ... Novel technologies and fundamental changes in scientific principle do not substantively pre-exist themselves, except and only in terms of the imaginings, expectations and visions that have shaped their potential. As such, future-oriented abstractions are among the most important objects of enquiry for scholars and analysts of innovation. Such expectations can be seen to be fundamentally 'generative', they guide activities, provide structure and legitimation, attract interest and foster investment. They give definition to roles, clarify duties, offer some shared shape of what to expect and how to prepare for opportunities and risks. Visions drive technical and scientific activity, warranting the production of measurements, calculations, material tests, pilot projects and models (Borup et al., 2006: 285–286).

These words can without almost any change be applied to the expectations of the revolutionaries – the regime they want to create does not pre-exist except in imagination, so future-oriented abstractions are crucially important in guiding their activities.

This makes us turn our attention to the Gartner's hype-cycle, which describes the dynamics of expectations of a certain innovation during the early stages of the innovation's life cycle (see, e.g., Linden and Fenn, 2003; O'Leary, 2008, 2009; Jun, 2012; van Lente et al., 2013; Adamuthe et al., 2015; Sasaki, 2015, for more detail on Gartner's hype-cycles). Let us note that, according to Artemy Malkov's observation, the technologically stipulated dynamics of the protest activity during the previous phase transition somewhat resembles the dynamics of the new technologies expansion in the course of Gartner's Hype Cycle (see Fig. 4).

If this hypothesis is true, we are now in the second phase of this cycle, characterized by a notable decline in the level of protest activity. However, it will be very probably followed by a new (not such a dramatic one) phase of increase in the level of protest activity, after which its intensity will likely stabilize at the values lower than the 2011 peak, but still remarkably higher than the level of the first decade of this century.

Conclusion

There are grounds to conclude that in 2011–2012 the World System experienced to some extent a phase transition to a qualitatively new state of global protest activity (phase transition B). This phase transition appears to bear some resemblance to the one which the World System experienced in the early 1960s (phase transition A).

Table 2
'Post-Kondratieff' long waves and their phases.

Long wave number	Long wave phase	Dates of the beginning	Dates of the end
Three	A: Upswing	1890–1896	1914–1920
	B: Downswing	From 1914 to 1928/29	1939–1950
Four	A: Upswing	1939–1950	1968–1977
	B: Downswing	1968–1974	1984–1991
Five	A: Upswing	1984–1991	2008–2010?
	B: Downswing	2008–2010?	?

Sources: (Mandel, 1980; Dickson, 1983; Van Duijn, 1983: 155; Wallerstein, 1984; Goldstein, 1988: 67; Modelski and Thompson, 1996; Pantin and Lapkin, 2006: 283–285, 315; Ayres, 2006; Linstone, 2006: Fig. 1; Tausch, 2006: 101–104; Thompson, 2007: Table 5; Jourdon, 2008: 1040–1043; Korotayev and Grinin, 2012; Korotayev and Tsirel, 2010; Korotayev et al., 2011a). The last date is suggested by the authors of the present paper. It was also suggested earlier by Lynch (2004), Pantin and Lapkin (2006): 315, see also Akaev (2009), Akaev et al. (2011, 2012).

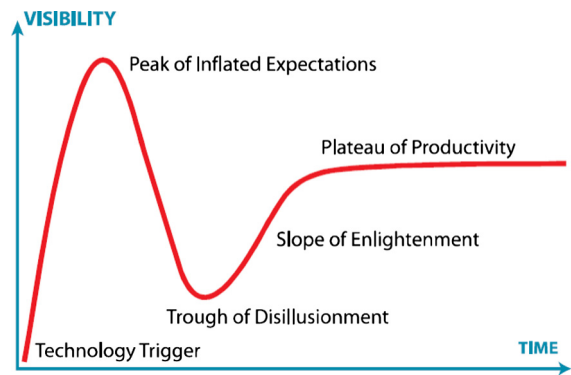


Fig. 4. Stylized graphic representation of the dynamics of the new technologies expansion in the course of Gartner's Hype Cycle. Source: https://upload.wikimedia.org/wikipedia/commons/9/94/Gartner_Hype_Cycle.svg

The first (after 1919) phase transition occurred in the early 1960s and was related to the growth of global informational connectivity after the World War II, as well as the improvement of the means of protest self-organization due to the spread of television, portable radio receivers, portable electric loud-speakers and other technologies of the Fourth Kondratieff Cycle.

And although the global information connectivity was growing all the 1950s, the protest activity growth took place not gradually but abruptly at the beginning of the 1960s. If CNTS registers 20–30 large anti-government demonstrations per year before the phase transition A, at the beginning of the 1960s this level jumps up to a hundred.

Then, in 1964–1966 (but especially after the peak of the late 1960s – in 1971–1973) a noticeable decline could be noticed. However, by the 1980's the level of global protest activity that seemed anomalous in the early 1960, is becoming quite normal.

In the last 20 years before the Arab Spring there was a tendency to decline in the global protest activity, and in 2010 it was the lowest since the mid-1970s. But even in 2010 it was higher than whatever recorded in CNTS before 1960.

The phase transition of the early 2010s was prepared by a new wave of growth of global informational connectivity, as well as the improvement of the means of protest self-organization due to the spread of various technologies of the Fifth Kondratieff cycle (the Internet, satellite television, Twitter and other social networks, mobile telephony etc.). Similarly to what was observed during the Fourth Kondratieff Wave, during the Fifth Cycle while the spread of these technologies was going on for many years before 2011, their internal colossal potential for generating and spreading protest activity was realized in one leap, as a phase transition.⁶

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⁶ Incidentally, as has been mentioned by Fred Phillips in his correspondence with us, he "anticipates massive protests as the robots and AIs take over almost all blue collar, white collar, and administrative jobs" during the forthcoming Sixth Kondratieff Wave (Phillips, 2016). We agree that this is a rather likely way how the technologies of the Sixth Kondratieff might produce Phase Transition C. Phillips is also correct to note that "the regularity of historical cycles, as you present them, implies that it is immaterial whether a protest results in regime change (Algeria) or not (USA), or whether it achieves its stated goal (ending the USA's Vietnam war or apartheid in South Africa) or not (Occupy Wall Street; Occupy Abay in Russia). It also implies that regimes can better plan when to prepare for internal vs. external threats, but offers no help to dissidents about how to make protests more effective" (Phillips, 2016).

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