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The Dilemma of Highly-Skilled Mexican Migration: Brain Circulation or A New Mode of Dependency?

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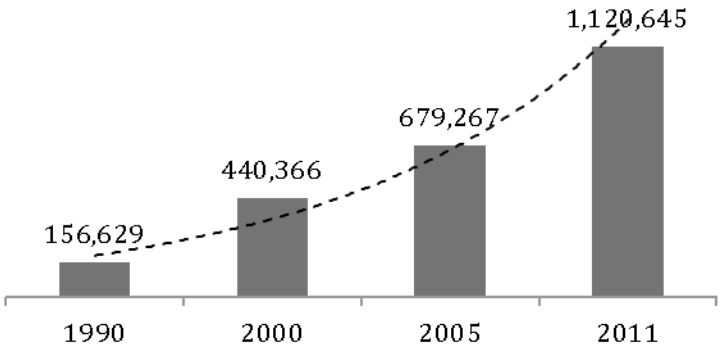
Introduction

Resulting from the implementation of structural adjustment programs in Mexico, Mexican migration to the United States experienced an unprecedented growth. The signing of the North American Free Trade Agreement (NAFTA) accentuated further the phenomenon to the degree that it turned Mexico into the number one country of emigrants in the world. This seemingly inexhaustible expulsive force brought with it profound qualitative transformations in the migratory phenomenon associated with processes of deep social transformation. One of these, which has received relatively little attention in the literature, has to do with highly skilled labour migration, which in the last two decades has shown a pace of growth greater than Mexican migration in general, which makes Mexico the second-ranked country in the world in sending highly skilled migrants to the United States; first to the rest of Latin America and sixth to the rest of the world.

Figure 1. Growth of Mexican highly skilled migration to the United States 1990-2011



Source: SIMDE UAZ. Estimate based on U. S. Census Bureau, Per cent Samples 1990 and 2000; and the American Community Survey 2005 and 2011.

The purpose of this article is to enter into the analysis of this phenomenon from a comprehensive and critical analytical perspective. We are interested, above all, to uncover the role played by *brain power* originating in Mexico –and in general that of the countries of the South– in the process of restructuring of the systems of innovation that were deployed within the framework of neoliberal globalization and at the hand of large multinational corporations. We believe that from this analytical perspective it is possible to deepen our understanding of the nature and characteristics of highly skilled labour migration, in contrast to the dominant perspective that decontextualizes its analysis and restricts it to a supposed transition from *brain drain* to *brain circulation* and an eventual *brain gain* favouring the countries of origin.

Our central hypothesis is that the export of scientific / technological capabilities (*brain power*) consists of a higher phase in the strategy of restructuring initiated by large multinational corporations with the aim of lowering their labour costs through the resource of the inexpensive labourforce originating in peripheral or emerging countries and regions; this is a situation that, rather than benefit the migrants' countries of origin, has led to the emergence of new forms of unequal exchange and dependency along the South-North axis.

Workforce export and the dynamics of Mexico-United States integration

For our purposes, it is important to draw attention to a few essential features of the economic integration process underway with Mexico and the United States, which developed largely over the past three decades. This process, notable for the implementation of neoliberal reforms in the country and the signing and activation of NAFTA, is characterized by three activities:

First Step: Dismantling and reinsertion of the Mexican economy

An unavoidable feature of the course followed by neoliberalism in Mexico is the accelerated dismantling of the productive, commercial and service apparatus in the country oriented toward the domestic market, which was turned around and reoriented toward the international market. This turn of the rudder made possible in a relatively short time the conversion of the Mexican economy into the principal exporter in Latin America and the twelfth worldwide. At first glance, this is not only a transformation to a new exporter role, but rather an unprecedented pursuit of a new exporting dynamic, consisting of some 80% manufactured goods, of which almost 40% are classified as goods embodying technological progress (Delgado Wise and Márquez, 2007).

The latter point has served the interests of the architects or designers of the Washington Consensus to label the Mexican case as a paradigmatic "success" story in the implementation of neoliberal reforms and an example of the benefits of "free trade." This, however, is nothing more than a distorted reflection of one vision of reality, an optical illusion that has nothing to do with what truly represents the export model implemented in Mexico. To reveal the real character of Mexican exports, one must understand that for the most part rests upon two pillars:

1. The maquiladora industry, made up of assembly factories associated with a strategy of productive, commercial and services relocation by large multinational corporations, principally of U.S.-origin, which seek to take advantage of the low labour costs prevalent in Mexico.[1] This kind of "industry" is characterized by a very high degree of component importation.
2. The *hidden maquila* refers to export manufacturing plants with productive processes that are relatively more complex than the *maquila*, as is the case in the automotive and electronics sectors, but whose operation is carried out under a system of temporary importation similar to the maquiladora industry.

Both the *maquila* and the *hidden maquila* are characterized by the lack of forward and backward linkages with the rest of the national productive, commercial and service apparatus, for which they are known as *enclave economies*. Similarly, both are subjected to the dynamics of labour uncertainty and feature significant wage differences with regard to U.S. manufacturing: 1/10 in the case of the *maquila* and 1/7 in the *hidden maquila*. The high degree of imported components in these activities, which represents between 80% and 75% of the total manufactures exported, means that their contribution to the Mexican economy is essentially reduced to a miniscule salary flow, that is, the value of the workforce incorporated into the exports (Cypher and Delgado Wise, 2011). Therefore, behind the mirage of an advanced platform of manufactured exports, what the country really exports through the products of the *maquila* and the *hidden maquila* is a workforce – even though these Mexican workers never leave the country (Tello, 1986). It is, to put it in more precise terms, a modality of *indirect export* of the workforce.

[1] At the heart of the restructuring plan of large multinational corporations under the neoliberal aegis is the displacement of parts of the productive and commercial processes, and of services toward peripheral countries and regions in function of the enormous income differences on a global scale, i.e., the global labour arbitrage. *See*, for example, Foster, MacChesney and Jonna (2011) and Delgado Wise (2013).

If one adds the direct export of labour that is produced through labour migration to the indirect export of labour, the true makeup of Mexican exports and the nature of the export model imposed upon the country reveal its actual significance. In effect, more than an advanced model of manufactured export, what in reality has been implemented in the country is a *cheap labourforce export model*. Such a development not only represents a step backward in the export program of the country, but also implies a frontal attack on the conditions of life and work of the majority of Mexicans (Delgado Wise and Cypher, 2007; Delgado Wise and Márquez, 2007; Cypher and Delgado Wise, 2011).

Second Step: *Creation of a surplus army of reserve labour*

As expected, the toll of the neoliberal restructuring was detrimental for the majority of the Mexican population: between 2000 and 2010 2.1-million jobs were created in the country, whereas some 9.5-million people were potentially looking for work. This resulted in an excessive growth in the reserve army of labour, which in this period reached a height of 7.5-million workers, of which 1.5-million were unemployed, 3.9-million fell into the ranks of informal workers and 2.1-million were international migrants (see Figure 2). This situation, which represented a stark scenario for the country, was aggravated by the runaway crisis in the United States from 2008 and by the massive deportations by the administration of President Obama (2-million deportations in the last 5 years, according to official statistics from the *U.S. Department of Homeland Security*).

Figure 2. Mexico: excess labour availability, 2000-2010

Source: SIMDE. UAZ. Estimates based on the U.S. Census Bureau, Current Population Survey, March Supplement, 2000 and 2010, and CEPALSTAT, Estadísticas de Empleo para América Latina, 2000-2010.

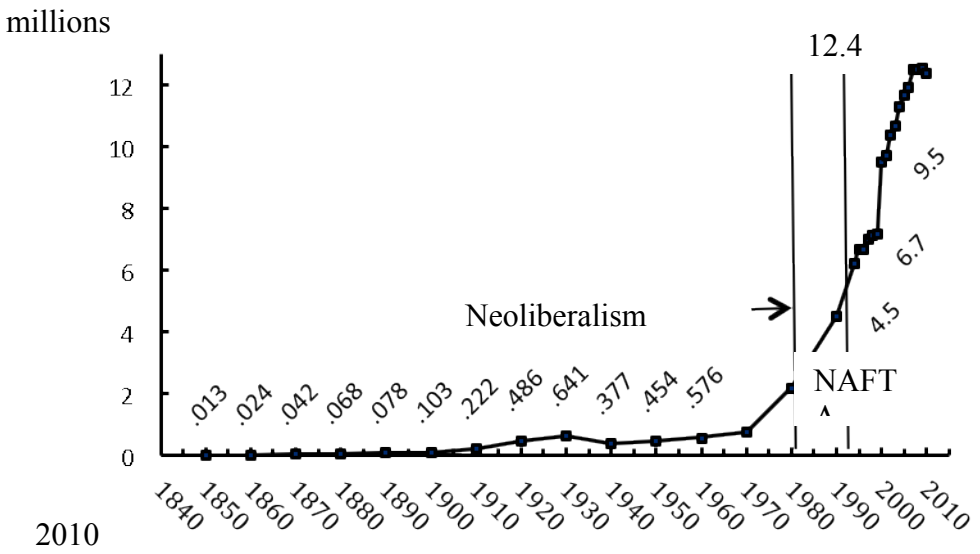
Even more, as a corollary of the excess labour supply integral to the dynamic of neoliberal restructuring in Mexico, according to data from the National Institute of Statistics, Geography and Informatics (INEGI, 2013), in 2012 60.1% of Mexican workers were in the informal sector, while 66.4% of waged and salaried workers saw incomes of less than 1.7 dollars per hour, and 84.5% worked more than 40 hours per week or less than 35.

One can also add that in the shadow of this atrocious attack against the Mexican working class, the ever-more porous boundaries with organized crime lie at the root of grim processes of social disintegration.

Third Step: Unleashing forced migration

Under the export model of a cheap labour, migration from Mexico to the United States has shown an exponential growth. This growth was made more acute with the arrival of NAFTA (see Figure 3); a fact that resulted in Mexico being the leading country of origin for migrants in the world. The heights reached by this migratory phenomenon are expressed eloquently in the following: in 2012 the Mexican-origin population residing in the United States was estimated at a little more than 32-million people, between emigrants – documented or not – born in Mexico (12-million) and U.S. citizens of Mexican heritage (20-million). This is the largest diaspora in the world, located in a single country, in this case the largest country of immigrants in the world.

Figure 3. Mexican Migration to the United States, 1840-2010



Source: Compilation of Decennial Censuses, 1850-1990; Pew Hispanic Center, 1994-2010 (Passel & Cohn, 2011).

Mexican migration to the United States has also experienced qualitative changes of the first magnitude with regard to levels of schooling, ethnic and gender composition, increased duration of migrant flows, etc. However, the most important characteristic is that this migration takes on, with increasing force, the aspect of forced displacement (Márquez and Delgado Wise, 2011). In this sense, those who join in the migratory streams are for the most part people who have literally been expelled from their lands, i.e., who abandon their places of origin by necessity with the hope of attaining some way to live or opportunities for social mobility beyond the country's borders. The conditions in which these displacements come to pass carry with them multiple risks and hazards all along the difficult migratory journey –particularly for migrants with few–, including the persistent exposure to conditions of labour instability and social exclusion at their destinations. Further, international migrants are being increasingly subjected to policies and practices of criminalization, racial profiling and discrimination, which not only creates vulnerable and segregated populations, but often put their very lives at risk.

Consider that more than half of Mexican migrants can be categorized as undocumented (Passel and Cohn, 2011), which places Mexico at the top of countries with the greatest number of undocumented migrants on the planet, with all that this implies in terms of stigmatization and social vulnerability. The forced returns that are the result of massive deportations and the United States' economic crises aggravated the situation described above.

It is important to note that, by virtue of the hemispheric extension of the policy of economic integration promoted by the United States' government, Mexico has become the key migratory transit corridor in the world. This involves, like the movement of their countrymen to the United States, a flow of forced migration subjected to ever-increasing conditions of vulnerability, where the growing number of victims on Mexican territory represents a red light, a very serious and embarrassing episode in the annals of the nation's history, that cannot and should not be avoided (Casillas, 2012; Castillo, 2005).

Restructuring of the systems of innovation under the neoliberal aegis

The context in which skilled migration occurs, particularly that originating in peripheral or emerging countries, is notable for a profound restructuring of the systems of innovation on a global scale, with the United States at the head and having the large multinational corporations acting as core agents. Four over-arching aspects are characteristic of this restructuring:

1. Increasing *internationalization and fragmentation of research and development activities*. In contrast to the traditional innovation processes "behind closed doors" in research and development departments that suckle at the breast of large corporations, this trend is known as *open innovation*, referring to the sharing of knowledge-intensive corporate functions with the growing participation of external partners, such as suppliers, clients, subcontractors, universities, etc., that results in the creation of "ecosystems" or networks of innovation (OECD, 2008).
2. The creation of scientific cities –such as *Silicon Valley* in the United States and the new *"Silicon Valleys"* inaugurated in peripheral or emerging regions, principally in Asia– where collective synergies are created to accelerate innovation processes (Sturgeon, 2003). At its root, as Annalee Saxenian (1995 and 2002) noted, this represents a new paradigm, that departs from the old "closed" models of research and development embedded in large corporations and which opens the way to a *new culture of innovation* based on flexibility, decentralization and partnerships, under various modalities, with new and ever more numerous players that interact in local and transnational spaces. Within the latter, innovation platforms that are set up in peripheral countries tend to operate as extensions of the established platforms in the core countries, taking advantage of salary, tax and other kinds of advantages, which lends to them a character of *scientific maquiladoras* (Gallengher and Zarsky, 2007).
3. The development of new methods of controlling research agendas (through risk capital, partnerships and subcontracting, among others) and of appropriation of the products of scientific endeavours (through the acquisition of patents) by large multinational corporations, through so-called *strategic investment*. It is interesting to observe how, while 76% of the patents at universities and about half of the total patents in recent years registered in the United States were attributed to foreign inventors, 93% of those were granted to multinational corporations (National Science Board, 2012; Partnership for a New American Economy, 2012; Rand Corporation, 2008; United States Patent and Trademark Office, 2012).
4. An expansion along the South-North axis of the highly-skilled workforce, in particular in the areas of science and engineering and the increasing recruitment –via partnerships, outsourcing and offshoring– of that workforce with particular significance in the case of peripheral countries (Batelle, 2012; Moris & Kannankutty, 2008). In fact, the evolution of

this dynamic of restructuring has crystalized in a *new geography* of innovation such as the scientific/technological research and development associated with it. Since 2011, the United States was overtaken by China, Japan, South Korea and India as the principal investor in research and development, and it is anticipated that in another decade, China will surpass the United States along that line (Battelle, 2013). With regard to scientific/technological capacities (brain power), according to the American Community Survey in 2011, 1 of every 3 Masters and 1 of every 2 PhDs in science and engineering in the United States was awarded to a foreigner –principally from peripheral or emerging countries–while outside of the United States, notably in China and the European Union, the ranks of PhD holders in the knowledge fields are growing faster than in the colossus that is North America (Freeman, 2008; Galama and Hosek, 2008).

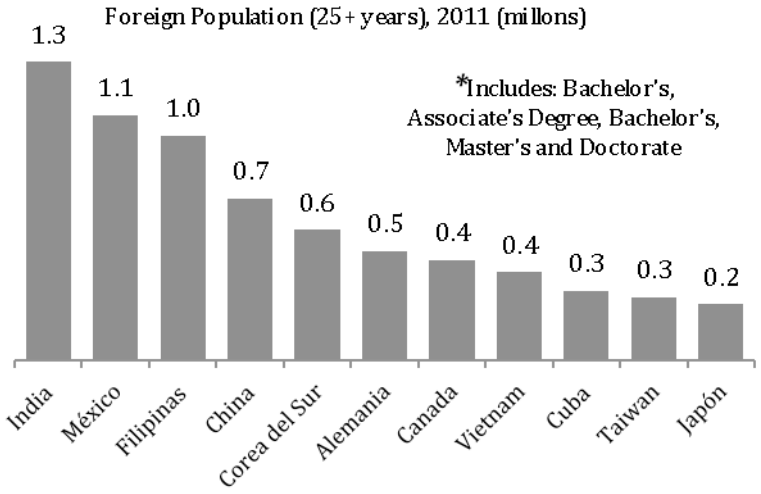
It is worth emphasizing that this restructuring dynamic has made it possible for large multinational corporations to employ a growing contingent of scientific-technological workers from the south, transferring risks and responsibilities and capitalizing on apparent benefits through an increased acquisition of patents. Under this new scheme, they have produced an unprecedented commercialization and monopolization of scientific work, with a short-term view that discards any social concern, where the physical and indirect emigration of highly-skilled workers from peripheral or emerging countries plays an increasingly important role.

Dimensions and characteristics of Mexican highly-skilled labour migration to the United States

Mexico is the top country in Latin America and sixth overall in the world for the volume of highly-skilled migrants it sends to OECD countries (Dumont, Spielvogel and Widmaier, 2010). The number of Mexican professionals with a Bachelor degree, Associate's degree, Master's and Doctorate that reside in the United States grew to 1.1-million, which places the country in second place among this category of immigrants to that country (see Figure 4). At the post-graduate level, the Mexican contingent –although relatively small compared to China or India– more than doubled in the last decade, reaching in 2011 a total of 129,027 with a Master's and 12,026 with a PhD. This figure is equivalent to 17% of all the postgraduates in the country (Tuirán and Ávila,

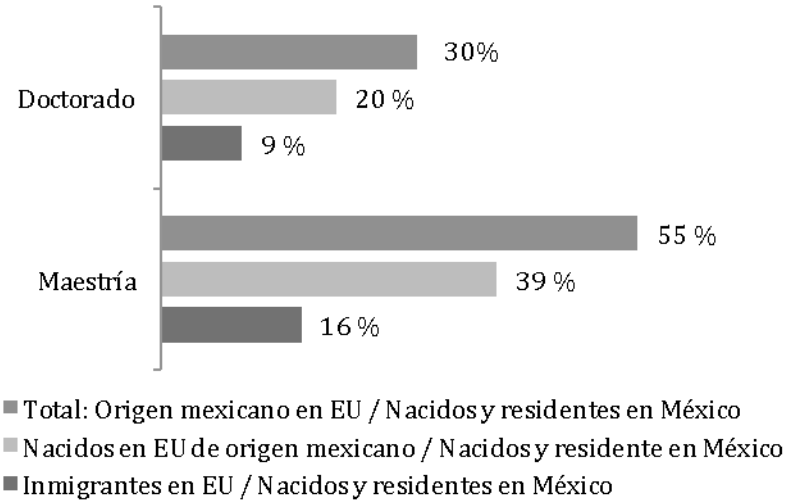
2013a). To those numbers, according to data drawn from the *American Community Survey*, we can add 2.5-million professionals of Mexican origin born in the United States, of whom 328,298 hold a Master's and 26,050 have earned a PhD. If we compare these figures with the highly-skilled population that resides in Mexico, the proportion of Masters' and PhDs of Mexican origin in the United States (immigrants and those born in that country) show –surprisingly and significantly– that they make up 55.2% and 29.7% of the total, respectively (see Figure 5). To these numbers another 60,000 highly-skilled Mexicans can be added that are classified as temporary migrants (Rodríguez, 2009).

Figure 4: Highly-skilled Immigrants in the United States by Country of Origin



Source: SIMDE UAZ. Estimates based upon U.S. Census Bureau, *American Community Survey* (ACS) 2011.

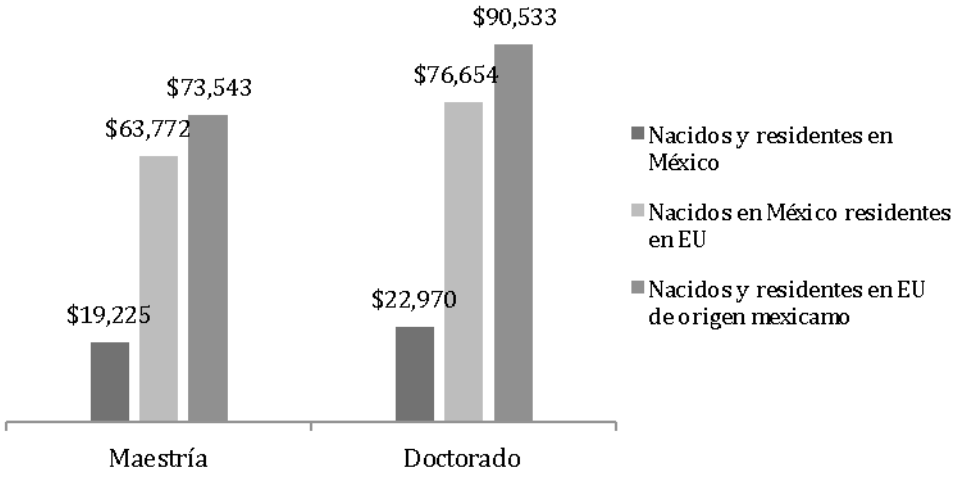
Figure 5. Relative weight of the population of Mexican origin with postgraduate education in the United States in contrast with the population resident in Mexico 2010-2011



Source: SIMDE. UAZ. Estimates based upon INEGI, Censo de Población y Vivienda 2010. y U.S. Census Bureau, American Community Survey (ACS), 2011.

Looking beyond these figures, which of themselves are shocking, it is necessary to highlight that only 54.7% of our countrymen are employed in professional or managerial activities in the United States (at the postgraduate level the proportion rises significantly: 74.3%) and that their incomes, including those of the professionals of Mexican origin, tend to be lower than the remainder of native-born citizens and immigrants. At the postgraduate level, the income picture for Mexicans and the population of Mexican origin in the United States follows the same pattern. Nonetheless, it is sufficient to note that in comparing these incomes with those received in our country, the situation is shown to be even more critical (see Figure 6).

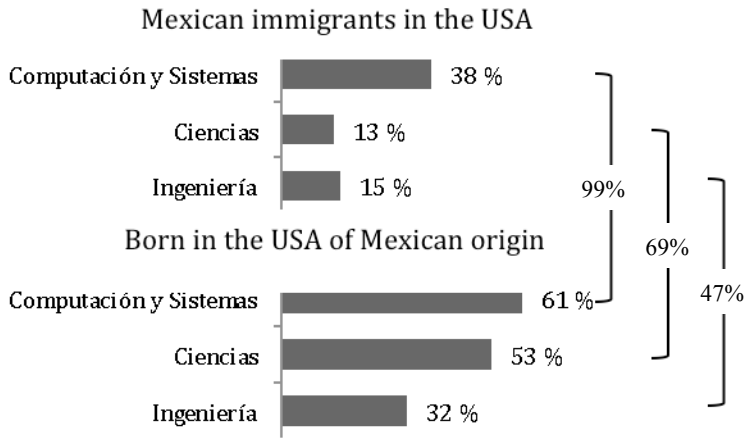
Figure 6. Monthly income in Mexican pesos of the population with a Mexican postgraduate education and of Mexican origin resident in Mexico and the United States, 2010



Source: SIMDE. UAZ. Estimates based upon U.S. Census Bureau, American Community Survey (ACS), 2011.

To the preceding we can add the low degree of higher education coverage that characterizes the country (30%), notwithstanding the ostensible increase that postgraduate education has had in the last decade, which underlines not only the limited creation of a highly-skilled workforce, but also a growing loss, waste and squandering of talents for national development. The situation takes on particular relevance when one considers the proportion of Mexican postgraduates in computing and systems analysis, sciences and engineering among those Mexicans resident in the United States (immigrants and those born in that country) compared to those who reside in Mexico, which represents 99%, 66% and 47%, respectively (see Figure 7). Furthermore, considering Areas I (Physics-Mathematics and Earth Sciences), II (Biology and Chemistry), IV (Biotechnology and Agricultural Sciences) and V (Engineering) of the National System of Researchers (SNI), the proportion of Mexican PhD holders resident in the United States (43%) exceeds by 11 percentage points the number who are resident in their home country (32%).

Figure 7. Relative weight of the population of Mexican origin with a postgraduate education in Sciences and Engineering resident in the USA contrasted to those resident in Mexico, 2010-2011



Source: SIMDE. UAZ. Estimates based on INEGI, Censo de Población y Vivienda 2010 and U.S. Census Bureau, American Community Survey (ACS), 2011.

In contrast to the Mexican migration experience in general, which is almost completely concentrated in the United States (98%), highly-skilled migration while principally oriented to that country exhibits a notable geographic diversification toward countries other than the USA, such as Europe, Asia and Oceania. The Institute of Mexicans Abroad has pushed for the creation of a network of skilled Mexicans abroad, which currently counts upon 27 chapters and has a presence in 12 countries.

The Fallacy of Brain Circulation

In the academic and political discussion on skilled migration the concept of "brain drain" has been abandoned, replaced by the notion of "brain or talent circulation" (Meyer, 2011; Saxenian, 2006). From this perspective, the pessimism and concern about South-North skilled emigration has been transformed into a rampant optimism that substitutes the notion of gain for that of loss. This view is based upon the supposition that knowledge is in itself beneficial for all and that contact with highly skilled compatriots abroad generates synergies that drive development in the country of origin, regardless of where, how, in what situation and for whom they work. Knowledge, as much as research agendas, are viewed as neutral, and in a similar vein the question of intellectual property –i.e., the appropriation of the products of scientific endeavour– is undervalued or simply ignored. Further, the unbridled euphoria around the "circulation of talent" and the creation of outreach programs with the "skilled diaspora" arise from the

assumption that innovation creates, through incubation processes, its own ties with the productive, commercial, financial and service sectors.

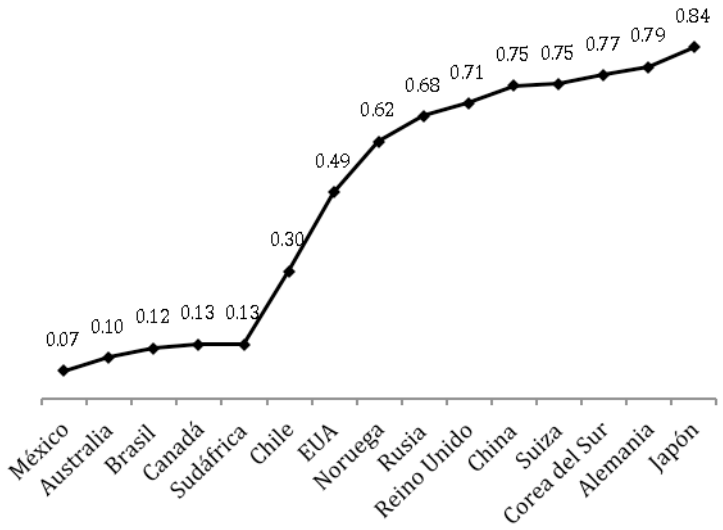
None of the assumptions upon which the optimism of the supporters and followers of the "brain or talent circulation" concept are grounded fit with the reality of contemporary capitalism. This does not mean, however, that the notion of "talent circulation" should be totally discarded. On the contrary, to explicitly identify its suppositions and to seek the mechanism by which it could be attained, particularly for the benefit of the country of origin's development, constitutes a useful reference point for the design of coherent public policies for innovation systems properly contextualized and tied to the country of origin, with direct pathways toward the productive, commercial and service sectors. A central element in this perspective is the establishment of a national patent system that allows for the appropriation of the fruits of scientific work, accompanied by incentives to drive strategic research lines that address the priorities and possibilities of national development.

In the Mexican case, the following facts and considerations allow for a better appreciation of the dimensions and characteristics of the problematic at hand:

- After China, Mexico is the country with the highest growth rate in doctoral programmes in the world: 17.1% between 1998 and 2006 (Cyranoski, Gilbert, Ledford, Nayar y Yahia, 2011).
- Postgraduate educational programmes in the country grew in number to 8,522, of which 5,865 were at the Master's level, 1,773 specialty, and 884 PhDs. These programmes were offered by 1,423 institutions, of which 1,134 are private and 289 are public. 56% of the doctoral programmes belong to the National Registry of Quality Postgraduate Studies in CONACYT, in contrast to the Master's programmes, of which only 16% are qualified at that level and where the greatest number of pogrammes are offered by private institutions (Sánchez Soler, Herrera and Ponce, 2012).
- The membership growth of the National System of Researchers (SNI - the programme that includes active researchers with a PhD in Mexico who work in universities or research centres) from 12,086 in 2006 to 18.554 in 2012, which also includes 700 members residing abroad, in no way compensates for the exodus of highly skilled emigrants from the country, given that in 2012 the number who returned amounted to no more than 93 (Sánchez Soler, Herrera and Ponce, 2012).

- In 2010, Mexico was awarded 14,576 patents, of which 93.5% belonged to foreign applicants (Villa Rivera, 2012). Similarly, the country is situated among the countries most dependent upon foreign technology in the world (see Figure 8).

Figure 8. Accounting of self-sufficiency in patents, by country



Source: SIMDE. UAZ. Based upon data from the Red de Indicadores de Ciencia y Tecnología Iberoamericana e Interamericana - RICYT. IMPI en cifras, 2011.

- In contrast to the previous accounting, which itself alludes to the practical nonexistence of a National System of Innovation, it is worth noting that Mexico is the top country in Latin America in regard to the outward migration of inventors (Miguélez and Carsten, 2013).

Clearly, then, the Mexican case not only fulfils the assumptions of the so-called *circulation of talents*, but also gained enormous wealth from the investment in higher education and particularly at the postgraduate level that has been implemented since the 1990s, although limited in comparison to more developed countries, where it had become somewhat superfluous. (Gandini and Lozano, 2012). In effect, without taking into account issues of quality –above all at the Master's level where, as we have seen, there has been a private institution *boom* in programme offerings– it is certain that the growth of Mexican postgraduate programmes had no

direct correlation with transformations in the labour market, due to the structural limitations derived from the cheap labourforce export model prevalent in the country. In this context, the ties –limited as they are– between scientific/technological development and the domestic economy tend to become even more dislocated and blurry, severely restricting the national demand for the highly skilled workforce. This situation translates into an excess supply of professionals and scientific/technological personnel, leading to a significant waste of talent (*brain waste*) and a growing increase in highly skilled emigration (*brain power*) to the United States and other destinations. If one considers, moreover, that salary incomes and labour opportunities for this segment of the population –although relatively few for citizens and other groups of immigrants– tend to be greater in the United States (and other countries) than in Mexico, it is easy to see that the exodus of Mexican talent will continue its ascendant course.

To this we can add the rising proportion of Mexican migrants who undertake their postgraduate studies in institutions of its northern neighbour (approximately 50%) and who for the most part were financed with public and/or private Mexican funding. This segment of the population, like that which received training in Mexico and resides abroad, is unable to find auspicious conditions, nor the salaries of those with professional development, to find a way to return or form ties from abroad with initiatives and projects that would contribute to national development. It is not unusual, in that sense, that barely 5.6% of the total number of returnees between 2005 and 2010 corresponded to highly skilled migrants (Tuirán y Ávila, 2013b).

Conclusions: the emergence of a new mode of dependency and its challenges

The restructuring of systems of innovation in the framework of neoliberal globalization constitutes a privileged vantage point for the analysis and understanding of the significance and implications of highly skilled migration as much for the countries of origin and destination, as for the key subjects involved: multinational corporations, universities, research centres and the migrants themselves. From this perspective, it is evident that notions of *brain drain*, *brain circulation*, and *brain gain* as supposed explanatory analytic categories for the phenomenon are unworkable and superficial.

Returning to the use of the notion of labourforce export to characterize the export model implemented in Mexico, it remains clear that the dynamics of the restructuring of systems of innovation referred to previously are etched into this dynamic. In fact, it takes the form of an

advanced or superior stage of that process that operates on two fronts: the direct export via migration of the highly skilled labourforce and the indirect export, via the implementation of *scientific maquiladoras*. The latter aspect is still relatively recent in the Mexican case. In this regard, Kevin Gallagher and Lyuba Zarsky (2007), in a fundamentally solid and significantly revealing study, revealed that foreign direct investment in information technologies to the so-called Mexican *Silicon Valley*[2] did not create a hotbed of innovation capable of generating multiplying effects on the Mexican economy and operated, rather, under the mode of an enclave economy.

In a deeper sense, it is necessary to caution that the export of the labourforce represents a new mode of *unequal exchange* on the North-South axis (and in our case, between Mexico and the United States), the understanding of which is crucial to reveal the processes of surplus transfer implied in the strategic / structural framework woven around the global commodity chains and that are at the foundation of the asymmetric reinsertion and subordination of the Mexican economy to that of the United States. Regardless of the centrality that the concept of unequal exchange had in decades past to explain the dynamics of unequal and destructive development, the nature of the ties between developed countries and emergent or peripheral countries –as conceived by the Economic Commission for Latin America (CEPAL) as well as among dependency theorists– its inclusion in the analysis of contemporary capitalism remains a weighty matter. It is important to keep in mind that most of the debate on unequal exchange was and remains limited to an analysis of the international division of labour that places the periphery in the role of source for raw materials and the developed countries as the providers of industrialized products. And although this division remains for a significant number of peripheral countries, it has stopped being exclusively a feature of North-South relations. Some recently-industrialized peripheral countries –principally in Asia– ever more frequently play the role of as providers of industrialized goods. Even more important is the fact that to this classic mode of unequal exchange a new factor has been added under the aegis of neoliberal globalization which is progressively taking centre-stage: the export, direct and indirect, of the labourforce.

To enter into the analysis of this modality with its dual fronts, it is important to note that the use of mechanisms of unequal exchange is more disadvantageous to the periphery than that implied in the exchange of raw materials for manufactured goods. On one hand, the indirect

[2] For some authors the Guadalajara region constitutes Mexico's Silicon Valley in counting on the presence of 12 manufacturers of original equipment,, 16 providers of electronic manufacturing services, dozens of design centres and more than, 700 companies that manufacture electronics (Manterola, 2008).

export of the labourforce associated with the participation of peripheral nations in adding value to global commodity chains, carries with it a net transfer of profits abroad. This represents an extreme form of unequal exchange, which implies a transfer abroad of practically the total economic surplus generated by the labourforce employed in the *maquiladoras* or assembly plants. This mechanism, which reasserts the logic of the export enclave, inhibits any economic growth and development derived from the process of export that, under the guise of manufactured exports, the peripheral nation performs. In fact, its key contribution to the process of national accumulation is limited to a meagre income flow –taking advantage of the enormous wage differential between countries, in our case between Mexico and the United States– and, in the best of cases, to a small multiplier effect by way of consumption. Even more, the installation and operation of assembly plants in peripheral countries, accompanied by subsidies and extended tax breaks, the weight of which is born by social capital of the country in question, such as collateral damage like the narrowing, differentiation and increased precariousness of the labour markets and environmental degradation. Another aspect of the indirect export of labourforce, which has begun to gather force in the context of peripheral or emerging countries, is the creation of joint scientific/technological complexes, as we have seen, to the restructuring of the systems of innovation in some of the more developed countries, with the United States in the lead role. By way of these complexes, which function under subcontracting arrangements, associations or other forms of partnership, intangible benefits are transferred abroad that have a value and a strategic significance beyond the net profits accruing from the *maquila* and assembly plants. We refer to the transfer of development capabilities and progress, which takes the form of competitive advantages and capabilities to generate extraordinary profits.

On the other hand, the direct export of the labourforce via labour migration implies a transfer of the anticipated future benefits that arise from the costs of training and the social reproduction of the workforce that emigrates. These costs –as the case of Mexico has shown– are not compensated for by the flow of remittances (Delgado Wise, Márquez and Rodríguez, 2009). In demographic terms, this transfer –for peripheral countries that are located in an advanced state of demographic transition– means that their demographic good, that is, the population of productive age that supports the population of pre-working age and seniors. In a more profound sense, this transfer implies the loss of the most important resource for capital accumulation in the country of origin: its labourforce. Furthermore, the export of the highly skilled labourforce

exacerbates the problem, seriously reducing the country of origin's capacity to innovate for its own benefit and drive technology-intensive development projects.

To analyse these new modes of unequal exchange presents theoretical, methodological and empirical challenges, which require changes to the perception and characterization of the categories typically used to interpret contemporary capitalism. Nonetheless, without disregarding the significant contributions of CEPAL to advance the understanding of this phenomenon (above all in regard to the central role played by technical progress), it is important to bring to bear Marxist theories of unequal exchange in its dual aspects: in a strict and broad sense they provide a solid and fertile conceptual basis upon which to advance the conceptualization of the emergent modes of unequal exchange implied in the export of the labourforce. On one hand, unequal exchange in the strictest sense places income differentials derived from barriers to population mobility (that, in more precise terms, refer to the differentials in the rates of surplus value) at the centre of the analysis, and on the other hand, unequal exchange in the wider sense adds to those differentials emanating from the diverse organic compositions of capital, i.e., the differentials in scientific / technological progress of the countries involved. We take into consideration that the internationalization of capital in the framework of neoliberal globalization seeks incessantly to lower labour costs –including those relating to the highly skilled labourforce– and maximize the transfer of surpluses between peripheral and developed countries, precisely in the taking advantage and deepening of wage differentials.

This leads us to conclude that the export of the highly skilled labourforce originating in peripheral or emerging countries, far from constituting an option in which everyone wins –as the currently in vogue notion of talent circulation declares– represents *a new mode of dependency* that is particularly devastating and predatory. Based on this scenario, the great challenge for Mexico consists in countering the dynamics that separate highly skilled migrants and professionals of Mexican origin who reside in the United States and other parts of the world from the processes of national development, in order to build an alternative project capable of taking on the prevailing systemic order for the benefit of the working classes.

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