



Associazione Studi e Ricerche  
Interdisciplinari sul Lavoro

**Working Paper n° 33/2018**

**STRUCTURAL CHANGE, EMPLOYMENT AND INSTITUTIONS**

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Anno 2018

**ISSN 2280 – 6229 -Working Papers - on line**

ASTRIL (Associazione Studi e Ricerche Interdisciplinari sul Lavoro)

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esemplare fuori commercio  
ai sensi della legge 14 aprile 2004 n.106

Per ciascuna pubblicazione vengono soddisfatti gli obblighi previsti dall'art. I del D.L.L. 31.8.1945, n. 660 e successive modifiche.

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## STRUCTURAL CHANGE, EMPLOYMENT AND THE ROLE OF INSTITUTIONS

(*Sebastiano Fadda\**)

### Introduction

The aim of the paper is not so much to describe the structural changes that have occurred (or that are occurring) during a certain period of time, but rather to detect the dynamic forces which drive the process of structural change and to detect the institutions that influence these forces and therefore the areas in which the State can play a role in governing the process. With this aim, the paper is organized as follows.

- The first section is devoted to clarify the concept of structural change and to place it in the contest of growth theory. Technical progress and demand expansion are considered uniform through the economy both in neoclassical models (in which the aggregate production function implies variable coefficients of production but is framed within the hypothesis of neutral technical progress à la Hicks) and in models à la Leontief (where the production system shows fixed coefficients of production and where growth is supposed to leave the internal proportions unchanged). On the contrary, the original Pasinetti's approach shows that the combination of disproportional changes in technology and disproportional changes in demand among the various sectors results in a disproportional growth of the economy and in a deep change in its structure.

- The second section elaborates on Pasinetti's approach in search of understanding the process of structural economic dynamics. Both the supply side and the demand side aspects are considered, although it is always the increase in productivity combined with the so-called Engel's law that causes a change in the composition of aggregate demand and consequently different rates of investment and growth in different sectors, creating in this way problems for economic and employment stability.

- The third section is devoted to discover the "determinants of the determinants" of structural change in order to suggest possible areas of public intervention for governing and somehow directing the process of change. In this light the attention is concentrated on the role of institutional factors, such as the trade regime, the degree of monopoly, the degree of income inequality, the industrial and innovation policy, public consumption and welfare state policy. All these factors may deeply influence on the one hand the intensity and the direction of technical progress in each sector and on the other the composition of final demand, significantly affecting the evolution of structural change.

Finally, the fourth section deals with the possibilities open (or, rather, simply left in a globalized economy) for every single country to effectively act on such institutional factors in order to manage the process of structural change of its own economy. The fifth section is a brief conclusion.

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1. Structural change can be defined and measured, in global and static terms, as half the sum of the absolute values of the differences in sectorial value added shares over time. This calculation avoids that differences in sign cancel each other:

$$\frac{1}{2} \sum x_{i,t} - x_{i,t-1}$$

where  $x_i$  are each sector's shares of total value added at times  $t$  and  $t-1$ .

Of course, this measure encounters two serious problems, which must be adequately solved in order to obtain a significant index of structural change. The first is the problem of changes in relative prices and the second is given by the changing boundaries and aggregations of sectors over time.

Having solved these problems the index represents a synthetic measure of the intensity of structural change over a period of time in aggregate terms; however the actual change of the structure of the economy can be seen only by looking at the full input-output table.

The change of the structure of the economy does not appear in standard models of growth: growth is always considered equiproportional in the sense that all sectors are assumed to grow at the same rate. In neoclassical models *a la* Hicks, where an aggregate production function with elasticity of substitution is assumed, this is due to the assumption of neutral technical progress. In the Harrod model, the assumption of fixed coefficients of production discards the hypothesis of non- proportional growth. Therefore, generally, structural dynamics is not embodied in growth models.

On the other hand, other models adopt a structural view of the economy but without considering growth. Sraffa (Sraffa, 1963), for instance, deals with the frame of structural interdependence, but no change in the volume of production is present in his model. Nevertheless, his model is a good starting point for combining the two aspects (growth and structural change) and for enlightening the process of structural dynamics.

The structure of the economy is given by:

$$A Q' + PN' = Q'$$

where  $A$  is the matrix of technical coefficients of production,  $Q'$  is the vector of final production and  $PN'$  is the net product vector, since  $A Q' < Q'$ .

The process of structural dynamics *à la* Pasinetti (Pasinetti, 1983) can be viewed considering that changes in the vector of final demand  $PN'$  will determine changes in  $Q'$  (final production). In fact, since  $PN' = Q' - AQ'$ ,  $PN' = (1-A) Q'$  and therefore  $Q' = (1-A)^{-1} PN'$ . But changes in the final production will mean changes in the allocation of capital and labour in different sectors, and this in turn will imply different rates of investment and technical change in different sectors and consequently a change in the whole matrix of technical coefficients  $A$  as well.

Consequently, given the disproportional growth of final demand implied by the so-called Engel's law, we have necessarily disproportional rates of investment and productivity increases in different sectors, and consequently disproportional and unbalanced growth associated with a continuous structural change of the economy.

Without entering into the details of the structural changes that have occurred in recent and less recent times (since the aim of this paper is not to describe the changes but to analyze the process of change and its driving forces), we can just mention the main, and well known, stylized facts.

First, the employment share of the agricultural sector generally declines during the development process.

Second, the employment share of the manufacturing sector increases in the early stages of development (“industrialization”) and decreases in later stages (“tertiarisation”).

Third, the employment share of services increases during the development process (with a boost of the financial sector in more recent times)<sup>1i</sup>.

It has to be stressed, though, that although these are general trends of the structural change worldwide, each country, each economic system, shows particular and specific features of change. It is precisely in order to understand and to explain the specific shape that the structural change takes in different countries that the discovery of the driving forces of the process of change is needed. Therefore, we have to turn now to consider the determinants of structural change. However, we should anticipate from now that spotting the explanatory factors will not be enough. If we are in search of elements for economic policy based on solid ground, we have to push the investigation further: we have to explore a second level of the causation chain, that of the determinants of the determinants, because it is on them that public policy should act in order to manage the process of structural change.

2. As far as the determinants (i.e. the driving forces) of structural change are concerned, two main, and perhaps opposite, views can be considered. The first one is the demand side view. According to this view, structural change, that is the disproportional evolution of the sectoral composition of national output, is a by-product of growth.

The existence of non-homothetic preferences implies that, with increasing income levels, the increase in aggregate demand, and therefore in the general level of activity, is disproportionately distributed across different sectors. Different factor intensities together with different rates of technical progress in different sectors give to this disproportional increase in aggregate demand the effect of changing the whole structural interdependence table of the economy. The composition of the final production will change and so will the allocation of capital and labour among sectors.

It is important to point out that this process, according to Pasinetti’s view, implies three particular structural features. First, different rates of profit will appear in different sectors; second, different rates of investment will take place in different sectors; third, the structure of relative prices will be altered. Therefore, the all structure of the economy will undergo deep transformations; capital, consumptions and output will

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<sup>1</sup> These general trends have been detected since the early works of Kuznets (1966) and, Chenery (1968), and are also confirmed in more recent studies (Maddison, 1991; Maddison, 2003; Haraguchi, 2010)

not grow at same constant rate all over the economy. In conclusion, the growth path is fundamentally unbalanced.

However, there is a second view, which we may call a supply side view, that sees a reverse direction of the causality chain. It is a view that can be traced in several and well known interpreters of the evolution of the economy all over the world. According to Rostow (1965), Kuznets (1966), and Chenery (1968), for instance, it is growth which is the result of changes in the sectoral composition of output, rather than the other way round. According to their findings the origin of the growth process has to be seen in the flow of capital and labour from less to more productive sectors. This movement raises the overall productivity and this in turn raises per capita income, demand, investment and growth. Actually, some relevant match between this view and several empirical evidences can be found. On the same ground, a process of decline can be explained by opposite flows of capital and labour. In fact the slowdown and also the decline of some economies in the context of globalization may be often attributed to a movement of capital and labour from more productive sectors (swept away by hard international competition) to less productive sectors (such as traditional service sectors and poor local unskilled manufacturing)<sup>2</sup>.

After all, this view is more compatible with the traditional neoclassic approach. In fact it shares the view of market clearing prices and of the working of a self-adjusting and equilibrating mechanism.

And, actually, it is on this ground that Acemoglu (Acemoglu and Guerrieri, 2008), although admitting the existence of unbalanced growth process in the short run; seems to believe in the automatic achievement of balanced growth in the long run. This is exactly the opposite of Pasinetti's view, according to whom disequilibrium and instability are the permanent state of the economy.

The distinction between supply side and demand side views concerning the driving forces of structural change does actually fades away when we consider at a deeper level the approach of Pasinetti. In a latter contribution (Pasinetti, 1993) he focus the analysis on the role of "learning", and in this light a strong interactive relationship is envisaged between the change of coefficients of production due to technical progress and the changing composition of consumer demand, both stimulated and shaped by the process of "learning". It is their uncoordinated interaction that results in permanently disproportional and unbalanced growth.

As it can be seen from  $Q' = A Q' + PN'$ , structural change could occur in two different hypothetical situations: a) without changes in demand composition if changes in the matrix of coefficients of production due to technical progress take place; b) without changes in the matrix of technical coefficients if changes in the vector of final demand due to consumers demand occur. The combination, or better the interaction, between the two opens the way to a process that can be called of "cumulative causation", which operates through a kind of multisectoral multiplier. The multisectoral multiplier

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<sup>2</sup> The Italian economy, for instance, shows some signs of a negative process of this kind, see Tridico (2014); while in several Latin America and Africa countries this process is due to reallocation of workers displaced by high productivity increase in sectors affected by FDI and technology transfers: see Rodrik (2014).

mechanism means that any increase in expenditure in one sector spreads its multiple effects in other sectors according to their own income elasticities of demand, which are bound to change, according to Engel's law, differently in different sectors as aggregate growth takes place. This mechanism in turn develops a cumulative causation process, in the sense that the sectors with higher expansion in demand will have higher capital investments and higher increases in productivity, which will cause new increases in income levels and in demand according to sectoral income and price elasticities<sup>3</sup>. Changes in elasticities, on the other hand, will set in motion new disproportional dynamics which will strengthen the character of persistent unbalance in the process of growth.

The above interaction is stimulated by factors lying on the demand and on the supply sides of the determinants. Detecting these factors is important not only for the sake of better understanding the process of structural change, but also for the purpose of being able to choose the appropriate policy measures for managing this process.

If we consider an economy open to international exchanges, the first of these factors is foreign trade. The balance of trade, actually the structure of imports and exports, does have a significant impact on final demand. The income and prices elasticities of imports and exports will contribute to model the cumulative causation process, so influencing the growth, or decline, of different sectors<sup>4</sup>.

Also on the demand side, a second factor of utmost importance is the distribution of income. Since the aggregate effect of the Engel's law is the sum of its operation at the individual level, income distribution, in addition to simple per capita income, clearly plays a significant role in the sectoral composition of final demand.

Demographic changes are a third important factor. The patterns of consumption significantly differ among people of different ages. Therefore a changing age composition of population undoubtedly implies changes in the structure of aggregate consumer demand.

Finally, autonomous evolution of tastes may alter the individual sectorial allocation of consumption expenditure of same disposable income. The term "autonomous" cannot be taken here in its absolute sense. For the evolution of tastes to materialize, the actual availability of new products up to then unavailable and, often, the influence of marketing strategies are determining factors.

The supply side also shows several determinants of the interactive process of structural change. As we have already said, a shift of labour or other productive resources between sectors is able, given the differences in the level of productivity among sectors, to raise or to lower the overall productivity level. This process will impact on the rate of growth and consequently on the structural change of the economy.

A second important factor, from the supply side, can be seen in exogenous technical progress. Pasinetti's view on this issue is rather ambiguous. In fact, in spite of assuming as given the changes in technical coefficients of production, he repeatedly stresses

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<sup>3</sup> For some interesting empirical examinations of the elasticities issue see Bosworth (1987) and Parker (1992)

<sup>4</sup> These aspects are deeply considered in: Thirlwall, A. (2013).

that “the relevance itself of technical progress depends on potential demand,...any investigation into technical progress must necessarily imply some hypotheses (and if not explicitly it necessarily does so implicitly) on the evolution of consumers preferences as income increases” (Pasinetti, 1983, p.69). It must be recognized that because of the so called “fourth industrial revolution” this statement may be reasonably pushed further, up to admit not only the existence of “some hypotheses on the evolution of consumers preferences”, but even the perfect foresee of such evolution if not its actual manipulation and construction by the producers. This fact goes beyond the old story of “hidden persuaders” and the old marketing techniques; it is a question of the present “revolutionary” use of the “big data”. Surely producers’ expectations about the evolution of demand may lead the process of innovation, but it doesn’t necessarily need to be so ; it is sufficient to assume the existence of a cost-reducing effect of technical progress and of a strong competitive Schumpeterian market in order to explain the impulse towards the adoption of technological innovation<sup>5</sup>. Therefore, in the light of the “permanent learning process” explored by Pasinetti, it seems possible to speak in this sense of endogenous technical progress as a trigger of the cumulative causation process of structural change.

Even according to more recent approaches economic growth is considered fundamentally linked to structural change via the different rates of technical progress taking place in different sectors. “Countries’ economic growth is largely expected to be related to processes of structural change which are in turn due to sectoral differences in innovation activities” (Malerba, 2004). These “differences in innovation activities” are explained in terms of “sectoral systems of innovation”, rather than with the old approach of “regional systems of innovation” or the “milieu innovativo”. According to this view, the differences among “sectoral systems of innovation” can be traced in three fields: knowledge and technological domain; actors and networks; institutions. All of these fields show specific features in different sectors and countries, and this fact seems to be, according to this approach, the root of structural change of the economy.

Having depicted the substance of the process of structural change, let us turn now to consider its implications for the quantitative dynamics of employment.

If growth with structural change takes place, it is clear that growth cannot exceed the rate at which the quantity of labour required would exceed the quantity of labour available in the economic system; therefore it must be:  $I Q' \leq L$  (where  $I$  is the vector of labour coefficients and  $L$  the total amount of labour available). On the other hand, if the initial condition is one of full employment, in order to full employment to be maintained it must be:  $I Q' = L$ , which means that given the changes in the vector of labour coefficients and in the matrix of technical coefficients, only appropriate changes in final demand (which could be calculated in a multisectoral model) will be consistent with maintaining full employment. If the sectoral composition of production were to remain unchanged, this would imply a growth of the demand coefficients proportional

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<sup>5</sup> In this regard, it is worth mentioning that from the well known “productivity function” of Sylos Labini (1999, p. 259) can be deduced that firms are pushed to adopt labour saving innovations simply by the difference between wages and price of machinery and also by the absolute labour cost, regardless of expectations about consumer demand.

to the reduction of the labour coefficients determined by technical progress. This by itself would create problems, since no demand coefficients can increase indefinitely at the same speed of technical progress. Moreover, the fact that both the sectoral composition of final demand and the matrix of technical and labour coefficients do change with growth creates a more problematic situation. Indeed the increase in demand coefficients of old goods and services could likely not be sufficient to make sure that the quantity of labour required equals the quantity of labour available. This equivalence would then be conditional on appropriate increase in demand for new goods and new services which, similarly, is not sure to happen.

At this point it must be specified that the “quantity of labour available” is the product of the standard working time per worker multiplied by the labour force. So, in case the increase in final demand should fall shorter of what is required for maintaining full employment, an appropriate change in working time per man could become necessary in order to convert the required *amount of labour* into the *amount of workers* required to keep all the labour force employed. Here the issue of the so called “technological unemployment” cannot be avoided. It is not possible to dismiss the problem simply by trusting in the working of a permanent self-adjustment mechanism or invoking the experience of the past. The nature and the scope of the so-called “fourth industrial revolution”, the growing diffusion of cyber-physic systems, are phenomena so new that no lessons can be drawn from the past about their effects. If the goal of full employment is not to be abandoned and the increase in final demand is not enough for this purpose, there seem to be but two directions of policy measures left: either the engagement of the State as “employer of last resort”, or the institutional shortening of the working time<sup>6</sup>.

It could be possible to work out through a multisectoral model a la Pasinetti the proper combination of the three variables (more demand for old goods and services, new demand for new goods and services, and shorter working time) required to cope with technological unemployment. It is beyond the scope of this paper to produce an exercise of this kind, but it is within our scope to emphasize that although such necessary adjustments could take place in the long run, they are neither necessarily automatically achieved nor necessarily achieved at all. On the contrary, according to Pasinetti, “the fulfilment of condition (13) (ie. the above aggregate condition on employment and expenditure)<sup>7</sup> by no means entails an automatic self-adjusting process. The spontaneous forces operating behind it are in fact tending to make it *not* satisfied.” (Pasinetti, 2007, p. 285), and so we must consider “disequilibrium and instability (not equilibrium) as the normal state of the industrial economies.” (Pasinetti,

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<sup>6</sup> There is huge literature on these fields. About the first, on the line of the well known Minsky’s idea, see a positive proposal in Wray (1998) and a critical view in Sawyer (2003); about the second, see Fadda (2016 b)

<sup>7</sup> This fundamental condition is, according to Pasinetti, the sum of two conditions: a capital accumulation condition (each sectoral new investment must be equal to the corresponding sectoral demand multiplied by the rate of growth of population) and a macroeconomic condition (total amount of demand equal to potential national income). If this condition is satisfied, full employment and full capacity utilization will be achieved (Pasinetti, 1983, pp.47-54)

2007, p. 229). Since consumers must “learn” how to spend their increased incomes and producers must anticipate consumers new preferences; lack of coordination is bound to create unbalances and mismatches. As a consequence, the transition from one structural composition to another, both in final production and in the matrix of coefficients, is likely to create unemployment, instability and significant changes in fundamental macroeconomic variables, such as the shares of wages, profits and rent in national income, as well in personal income distribution. Such distributional changes, in turn, affect both the level of aggregate demand and the expenditure patterns in consumption and in investment, feeding the cumulative causation process of structural change.

Before considering the State intervention as employer of last resort or as imposer of working time reduction to cope with the failure to achieve full employment, it is wise to see whether this process of cumulative causation of structural change can be managed in order to get closer to fulfill that normative central “condition (13)” through policy and institutional measures acting on those factors previously mentioned as driving forces, i.e. on the determinants operating from the demand and from the supply side.

A first level of dealing with structural change would simply be coping with its consequences. This action should basically be oriented in two directions. The first is the reduction of the “adjustment costs” for industrial restructuring, which implies the removal of all obstacles which make it difficult for capital and labour to move from declining to growing sectors and from old to new technologies. The second is to avoid mismatches between demand and supply in the labour market: this implies a timely and efficient adjustment of the educational and vocational training system. It is clear, though, that paving the way for a smooth process of structural change in this way could not be enough for canceling the negative effects on the level of employment. While the direct effects of process innovations (both technical and organizational) are undoubtedly negative in the short run, the possibility that in the long run they might be totally offset by product innovation through the creation of new goods and new services is far from sure when the path of technical progress and of its diffusion speeds up. The fact that new goods and services may simply replace old ones rather than add to them, plus the fact that they may themselves turn into process innovation by becoming intermediate factors of production, just cast more doubts about this optimistic long run perspective.

It is therefore of most importance to consider whether the process of structural change can be managed, in the sense of being directed or at least significantly influenced by public policy towards satisfying the conditions for full employment. In order to do this it is necessary to have a clear view of what determines the driving forces at the root of its complex and cumulative process; in other words, it is necessary to look at the working of the “determinants of the determinants”.

3. It has been noted that the explanation given by Pasinetti about the structural change is not a satisfactory one. “Although Pasinetti relates both factors (*changes in*

*coefficients of production and changes in the composition of consumers demand*) with the learning principle, learning itself is essentially unexplained and therefore the question of what moves the driving forces of the economy remains unanswered” (Silva and Teixeira, 2008, p. 286).

In search of “what moves the driving forces” of the process of structural change of an economic system, we intend to single out the policy and institutional factors which are directly manageable in order to impress to this process a direction strategically advantageous for the level of employment.

3.1 A first factor is the distribution of income. A demand increase for goods and services can derive from process innovation itself through the price and income effects of lower prices and differs according to individual price and income elasticities. Being these elasticities different according to individual levels of income, income distribution comes to affect the aggregate increase in demand both for old and for new goods and services. This increase in demand works in the direction of compensating the loss of jobs due to technical progress and can be considered endogenous to it. But additional increase in aggregate demand can be obtained exogenously from direct policy action towards reducing both personal and functional inequality in the distribution of income<sup>8</sup>.

A wide range of actions of institutional nature can be taken to this purpose. Although someone thinks of excessive income inequality (whatever the quantitative definition of it) as a result of the efficient working of a competitive market economy, it is more correct to see it as a consequence of its bad functioning, failures and distortions. The degree of monopoly, following Kalecky’s approach, can be considered one of the most institutional factors at the root of excessive income inequality. Therefore, measures taken in order to free the market from restrictions to competition and to reduce the degree of monopoly (together with the power of big multinational corporations) would help towards a more even income distribution and a higher aggregate demand.

The abnormal expansion of the financial sector (a distinctive feature itself of structural change) and the absence of appropriate regulation are notoriously seen as driving forces of the excessive uneven income distribution<sup>9</sup>. Actions towards establishing an effective frame of regulation of financial markets and consequently reducing their power and their size, besides being a step towards more macroeconomic stability, would also help to reduce excessive inequality in income distribution.

A third major cause of growing income inequality is the progressive deterioration of industrial relations, brought about by unleashed deregulation of labour markets and falling bargaining power of workers organizations. The persistent gap between the rate of wage increase and the rate of productivity increase (ILO, 2017) is the main mechanism through which this loss of power of labour vis a vis capital shows its effect. Ideology and strong pressure of big corporations together with unregulated

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<sup>8</sup> See, for a suggestion of main policies to reduce inequality of income distribution, Fadda (2016)

<sup>9</sup> For a good treatment of this issue, see: Tridico (2017)

movements of capital and labour in a globalized world converge towards growing concentration of income and wealth in a small portion of population.

Beside acting on these factors in order to affect market income distribution, institutional restructuring of transfers (both in money and in kind) plus taxation should help correcting excessive inequality in disposable income. In addition, of course public expenditure remains the traditional tool to be used to achieve an appropriate aggregate demand management,

All these kinds of measures should be organically planned if consumers demand has to be stimulated in order to provide new job opportunities for the workers initially displaced by technological and organizational process innovations, given the fact that “there is nothing in the structural evolution of technical coefficients on the one side and of per capita demand on the other, as such, that will ensure fulfillment of the macroeconomic condition (*total expenditure must equal potential national income*<sup>10</sup>), i.e. the maintenance of full employment. Therefore, if full employment is to be kept through time, it will have to be actively pursued as an explicit aim of economic policy” (Pasinetti, 1983 p. 90).

3.2 While the point developed above concerns the level of aggregate demand, of similar importance is a second factor: that is the composition of consumption demand. The evolution of the patterns of consumption is relevant because the expansion in production of new goods and services depends on it, and also because, given the different labour coefficients of different sectors, the capacity of creating new demand for labour is strictly linked with the evolution of the composition of final demand.

Precisely on the composition of final demand institutional factors play a major role. The “learning process” of consumers to which Pasinetti refers may develop in different ways because sticky habits, lacking or imperfect information, social pressure, emulation or consumerism and other sources of motivation are able not only to delay or speed up, but also to direct the choices about new consumption following income increase. In this field, cultural factors and all that mix of attitudes, tastes and higher level preferences that A. Sen labeled under the name of “capabilities” exert a strong effect. In addition to these cultural factors, a decisive impact on the composition of final demand is given by the structure of public expenditure. The provision of public goods and public services, the public commitment for merit wants, the expenditure for the environment, the improvement of the welfare state may impress a crucial impulse on the volume, the speed and the shape of the evolution of final demand. The capability of State institutions and the visions and preferences of policy makers are determinant factors in this field.

A new element must nowadays be considered as capable of deeply affecting the evolution of consumers demand. It is the power gained by the producers as a consequence of the development of the so called “fourth industrial revolution”. One of the most relevant features of cyber-physic systems is the use of Big Data. In fact an enormous mass of information about each individual personal profiles is collected,

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<sup>10</sup> As described in footnote note 7

without them being aware, simply through their daily access to various internet platforms. Through sophisticated software provided with gigantic treatment capacity these data are elaborated in order to obtain a strategic personalization of consumer-producer relationship. In this way producers are able to modify the behavior of consumers, who are led, without them realizing, to make specific consumption choices inspired by the producers themselves, whose decisions, in turn, are influenced by the treatment of the big data acquired from consumers<sup>11</sup>. If on the one side this has the beneficial property of easing the correspondence between producers choices and consumers choices, there is no guarantee that producers choices be sufficient to create jobs to the extent needed to compensate the jobs displaced by the growing flow of technological innovations. On the contrary, it is likely to happen that increased consumptions of new goods and services actually displace more jobs. For instance, the increase in the use of new electronic entertainment can displace attendance to theatres or cinemas; online shopping can throw out of the market small shopkeepers and shop assistants; online ticketing can destroy jobs in travel agencies, use of innovative electronic domestic equipment can promote the self-production of home services, and so on, with a possible negative net effect on employment. Actually some goods and some online services seem to stimulate the growth of a kind of “self-service society”, where the production of many services is shifted from the “wage economy” to the “non-wage economy”. Because of the complexity and the ambiguous trends of these dynamic forces this is another area where institutional factors may play a strong role.

3.3 A third field where institutions and policy measures play are m mostly relevant in governing the structural dynamics of the economy is given by the mix of determinants that affect both speed and direction of technical progress. It is surely not the case of introducing here a debate over the explanatory factors of technical progress. But, from an institutional point of view, attention must be drawn to the fact that innovation policy is the most important tool through which industrial policy can contribute to shape the future sectoral composition of national production of a country. It is clear that the effects of structural change can be beneficial for a country conditionally on the general reduction of coefficients of production (including labour coefficients) being associated with appropriate expansion of sectors of high growth and employment potential. Countries with fast growing sectors will reap the benefits of structural change, while countries with slow growing (or declining) sectors will only suffer negative consequences in terms of economic growth and of employment. Therefore, governing and somehow directing the process of innovation towards appropriate sectors means to a large extent governing the process of structural change and the balance between jobs destroyed and jobs created in a country.

Taking account of these interacting forces, two fields appear to be open for institutional adjustment. The first is the redefinition of the role of the State. Theoretical

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<sup>11</sup> Well before the full explosion of the “fourth Industrial revolution”, all these kinds of problems were clearly perceived by Harvey (2005)

analysis and empirical evidence show that it is not true that withdrawing the State and giving way only to free play of market forces will benefit the economy of a country. Particularly in this area a strong action of the State is required not only in terms of indirect incentives, but also in terms of direct investment in research and in innovation activity in public sectors in order not only to speed up the rate of technical progress, but also to channel it into directions that may support an appropriate evolution of the sectoral composition of national product. (Mazzucato, 2013).

The second field is the implementation of a strong industrial policy. Many ambiguities can hide behind this term. In opposition to the view that any industrial policy of the State would be not only useless but also harmful, because by interfering with the free play of market forces would distort all processes of efficient allocation, is the view that the State should directly manage, sector by sector, through a sort of centralized planning, all the production and investment decisions. None of these is correct. A correct interpretation of industrial policy should ascribe to the State the task of taking, within the frame of a strategic view of the evolution of the economic system, a set of coherent measures required for achieving a better economic performance than the simple working of the free market would be able to achieve (Lall, 2006). It is not a question of substituting the State for market forces, but of charging the State with the task of supporting the process of structural change towards the achievement of long term strategic goals. Public investment can be a very effective tool to this end, by providing public goods relevant for industrial development, supporting the short term social costs of adjustment, and producing a positive impact on final demand and its composition.

Two strategic sectors in which technical progress must be encouraged and stimulated by public intervention are those of energy and environment. Both are sectors from which the divergence between public interest and particular private interests could divert the flow of research and development activities. Public policy is required in order that public interest prevail and the process of structural change follow a path capable of ensuring sustainable growth and full employment.

Finally, it must be remembered that the speed of technical progress and of diffusion of innovations is positive correlated with the competitive structure of the market. All kinds of restrictions to competition tend to slow down the path of technical progress, although some degree of monopolistic protection seems to be acceptable in the early stage of the introduction of a new technology or of a new product, in order to attract resources and private investment in R&D. This latter possibility is, though, totally different from blocking the system with widespread areas of protection against market competition. This is clearly another area where policy for institutional change could help in governing the process of structural change of the economy.

3.4 As it has been mentioned before, in an open economy sectoral specialization is related to its rate of growth and to its dynamics of employment. In fact, the multiplier effects and the cumulative causation process of structural change have strong interactions with foreign trade. In the multisectoral model à la Pasinetti, a distinction

has to be made, within the vector of final demand, between demand for domestic and demand for imported goods, and similarly a specification has to be made in the matrix of technical coefficients whether the inputs are domestically produced or imported from abroad. Again, we do not intend to enter here into the possible calculations<sup>12</sup>, but rather we intend to look at the role that institutions can play about freeing the economy from the risk of being trapped into some specific sectoral specialization detrimental to its long term growth. Leaving aside the explanations of the structure of international exchanges based on the comparative advantage principle, or on the factor endowments theory, or on the Samuelson-Stolper theorem, and so on, attention must be drawn on the institutional factors more relevant in this field.

In general terms, if we adopt the notion of institutions as patterns of behavior actually followed even by organizations and states, we find that the main institutional factor affecting the evolution of international exchanges is the neo-liberal ideology according to which unregulated free trade is always good for all. This belief together with the tremendous fall of physical constraints to the movement of goods at global scale and the neo-mercantilist “mania” may lead to reinforce any initial disequilibrium in the balance of trade of a country, opening the way to a spiral of further specialization which may be harmful for growth and employment in less favored countries.

A second institutional factor of utmost importance in determining the structure of the international exchanges of countries is the overwhelming role played by multinational corporations. By “shopping around” among countries competing with each other to offer the best conditions (which often is tantamount to saying the worst social and labour standards) to attract foreign direct investments, they are able to decide where to place plants and services and what sectors and stages of production locate in different countries. This affects deeply the structure of foreign exchanges of a country and the structure of its productive system. The path and the content of technology transfer comes also to be influenced by foreign direct investment. Alongside this direct impact, the power of multinational corporations is able to exert an indirect impact by their deep influence on the content of international treaties and “free trade” agreements, such as NAFTA, WTO, CETA, TTIP and so on. We can add various operations such as mergers, acquisitions, downsizing, restructuring, relocations, disinvestments that multinational are usually free to accomplish in countries where they have located their plants, and we have a clear idea of how strict is the relationship between the institutional set up and the structure of international economic relations of a country. Therefore, acting on this institutional “determinant of the determinants” is a way of governing the evolution of the productive system of a country.

4. At this point a fundamental question comes to the fore: how possible is for each single country to act effectively on the mentioned institutional variables, i.e. to make the appropriate choices of economic policy, in order to govern and pilot the process of

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<sup>12</sup> Since the work by Miyazawa (1960), perhaps the most interesting and extensive considerations in this field are to be found in the works of Rodrik. See, for all, Rodrik (2007). Of great interest is the study by Autor (2014), in which about one third of the loss of manufacturing employment in the States is attributed to imports from China

structural change of its own economy towards the objective of more growth and employment. Part of the answer lies in the capability of the State apparatus of the Public Administration and in the willingness and ability of the politicians and policy makers in general. This is a problem that it is not going to be dealt with in this note, which is devoted instead to deal with the degree of freedom left to nation States, or, in other words, with the strength of the constraints that the global economy and the international institutions of governance of the world economy impose to single States. Surely many national Governments are not able to fully exploit in the right direction the degree of freedom that is left to them at the present (and this is already a problem), but the problem to focus here is the strength of these constraints and the search of possible ways to get over them.

In general terms we can consider the constraints as coming from three sources: the lack of regulation of worldwide movements of capital and goods, the international institutions of economic governance, the power of multinationals. This bundle of sources affects the four “determinants of the determinants” of institutional change that have been mentioned in the above paragraph.

The lack of regulations of international movements of goods and capital has come out of a deliberate choice of national governments to abolish all kind of boundaries, restrictions and regulations of the huge flows that the diffusion of technology of information processing, telecommunication networks and sharp decline in transport costs have made possible. The volume of trans-border transactions (particularly financial transactions) has become exorbitant even in comparison with the volume of the public budgets of National States and at the same time information asymmetries (most interconnections may even remain unknown to regulators) and altered balances of power between global actors have made any possible regulatory activity by nation States extremely difficult and generally powerless. Particularly, the boosted financialization in the world economy has severely curbed the possibility of effective national government action towards more equal income distribution and more nationally oriented industrial policy (Tridico, 2017).

The present structure of global economic governance is totally inadequate. International bodies on the one hand are pretty ineffective in regulating global markets and particularly financial markets, on the other hand some of them are able to impose severe restrictions to national choices of economic policy, especially in those countries that mostly suffer from distortions of the process of structural change and are more in need of financial help. Such bodies are mainly the World Bank, the International Monetary Fund and the European Commission. One could add that these institutions also suffer a certain lack of democratic legitimacy, both because they are unbalanced in their composition and in their decision making process with respect to the economic and political weight of countries in the world scenario and because they lack accountability (Fadda, 2014). Particularly, the economic governance of the European Union imposes to member States such severe constraints (moreover of recessionary nature) that prevent the less strong member States from planning adequate public investments and adopting those welfare systems that would be

necessary to influence the evolution of coefficients of production and coefficients of consumption towards an increase of growth and employment.

The power of multinational corporations is such that not only they are able to influence the content of any regulatory activity and international agreement, but also allows them to directly interfere and prevail over what would be the best policy decisions in the national interest. They may also override nation States sovereignty by penalizing, in their decisions about investment allocation, those countries with more strict legislation on social welfare, on environment regulations, on tax regimes, on employment protection and on labour standards. In addition, they may also compel nation states to soften their legislation on such matters. Beside, by plant relocations and downsizing they can directly affect the productive structure of one country, the diffusion of innovations, the level of unemployment and the level of aggregate demand, while, by simply threatening such decisions they can reduce the bargaining power of trade unions and disrupt solidarity among workers. All this behavior is also likely to impact negatively on income distribution. So, the degree of freedom left to nation States for effectively acting to change the institutional frame which regulate all these variables is severely reduced (Hertz, 2001; Roach, 2007).

If the limits imposed by these three sources of constraints on the possibility of effectively governing the determinants of structural change are to be overcome, it is necessary to take measures along three directions. The first measure is the introduction of a proper degree of regulation of markets. The international flow of goods and still more the financial flows must be put under control. The idea of self-regulating efficient markets is just a myth, and there is enough empirical evidence of the disastrous consequences of leaving the international markets, and particularly the financial markets, unregulated. The second direction is the reform of the international bodies of global economic governance. Since in the global economy nation States have legitimacy but lack effective powers and international bodies could have effective powers but lack democratic legitimacy, an efficient balanced combination should be found between regaining single States sovereignty in some fields (such as economic policy and fundamental rights) and at the same time strengthening cooperation among them in a multipolar world through ensuring democratic legitimacy and operative effectiveness to international bodies. The third direction is the reduction of the power of multinational corporations.

They must be put under and not above the law, and the law itself must not be shaped under their dictates or anyway under their pressure.

One could ask at this point how possible it is to make significant steps ahead along these directions, but in order to avoid engaging in an endless chain of questions about what makes possible what, (which would lead far away and beyond the nature of this paper), it is better to stop here. The belief remains that no deterministic mechanisms are responsible for the shape acquired by structural change, but, rather, that institutions and political choices are the main contributing factors.

5. As a way of conclusion we can sum up the main points touched in our line of reasoning. The aim of the paper was not to make quantitative descriptions or to work out a formal model to deal with the problem of structural change, but to draw attention to the institutional components of the process.

Structural change can be defined as the change in sectoral value added shares of an economy over time. It is associated to economic growth via changes in the vector of final demand and in the matrix of technical coefficients of production. The question whether it is growth which causes structural change or, the other way round, structural change which causes growth, cannot be answered in either way. It is better to view the integration of the two causality nexuses in a kind of cumulative causation process linked with a multisectoral multiplier mechanism. In this frame the main driving forces can be identified, within the demand side, in the level and the distribution of income via the Engel's law, in the autonomous evolution of consumer tastes, in the evolution of the demographic structure, and in the structure of import and exports; while, within the supply side, we found fundamentally the role of technical progress and the shift of capital and labour between sectors of different productivity and different rates of profit.

The change in final demand and in technical coefficients of production creates disproportional growth and mismatches in the short run, while appropriate adjustments in the economic system could take place in the long run. The required adjustments could be calculated through a multisectoral model à la Pasinetti, although it is not sure whether they could be fully achieved at all and in any case not automatically: instability and mismatches could become permanent.

The negative effects of structural change on the level of employment could be offset by appropriate increase in demand for old goods and services and for new goods and services. Again, it would be possible to calculate the requirements of these increases in order to maintain full employment. If income and price elasticities and the aggregate demand management were not able to ensure the achievement of such increases, then complementary working time reduction would become necessary.

In order to govern the process of structural change towards the goal of offsetting the negative effects on the demand for labour and achieving full employment, some action on the institutions which move the "determinants of the determinants" are suggested. These actions are grouped into four areas: the area of income distribution; the area of consumption patterns; the area of technical progress and the area of foreign trade. However, in order to act positively and effectively on these areas national governments must overcome some obstacles that derive from three sources: unregulated freedom of international movements of goods and capital; inadequacy of global economic governance; excessive power of multinational corporations. These are the origins of the main constraints to governments appropriate choices and actions towards governing the process of structural change, but the problem of removing them is beyond the scope of this paper.

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