

A Service of

ZBW

Leibniz-Informationszentrum Wirtschaft Leibniz Information Centre for Economics

Cappellin, Riccardo

Conference Paper Investments, balance of payment equilibrium and industrial and regional policies in Europe

56th Congress of the European Regional Science Association: "Cities & Regions: Smart, Sustainable, Inclusive?", 23-26 August 2016, Vienna, Austria

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Cappellin, Riccardo (2016) : Investments, balance of payment equilibrium and industrial and regional policies in Europe, 56th Congress of the European Regional Science Association: "Cities & Regions: Smart, Sustainable, Inclusive?", 23-26 August 2016, Vienna, Austria, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at: https://hdl.handle.net/10419/174693

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



WWW.ECONSTOR.EU

Investments, balance of payment equilibrium and industrial and regional policies in Europe

Riccardo Cappellin

Faculty of Economics University of Rome "Tor Vergata" Via Columbia, 2, 00133 Roma - Italy <u>cappellin@economia.uniroma2.it</u>

Abstract

This article aims to indicate that an economic recovery of the European economy can be pulled by an increase of investments and of the aggregate demand and that it requires the adoption of a new industrial policy having a territorial dimension. While the Harrod's and Thirlwall's model indicates that growth is determined by the growth of exports and it does not consider investments, the article presents a macroeconomic model of internal demand led growth, which indicates that an appropriate distribution of investments between the export and the domestic sector can determine both an increase of GDP and the equilibrium of the balance of payment. The article clarifies that investment should be driven by the expanding demand of private and public goods and services related to the increasing needs by the citizens in modern cities such as: housing, mobility, health and education, leisure and culture, energy and environment, which require the expansion of production capacity and new infrastructures and also drive an increase of the internal market in Europe. A new industrial and regional policy should focus on the market demand and on the innovation adopted by the companies and the consumers and it should aim to facilitate the creation of those new markets (*lead-markets*) and productions, which are emerging in developed countries notwithstanding the current period of slow growth.

JEL Codes: E14, L52, O14, O18, O33,

Keywords: balance of payment, investment, innovation, industrial structure, industrial policies, macroeconomic policies

Paper presented at S_M. Regional policy in Central and Eastern European countries - Memory session to Gyula Horvath 56th ERSA Congress Cities & Regions: Smart, Sustainable, Inclusive? 23-26 August 2016, Vienna, Austria°° The economic strategy of the European Union is based on fiscal austerity, "structural reforms" and an expansionary monetary policy and it has been largely unsuccessful. Notwithstanding the enormous increase of the money supply by the European Central Bank, the private investments by the companies are only slightly increasing, after having sharply decreased.

The investments in the Euro area (12 countries) have decreased by 269 billion euro, while the GDP has decreased by 64 billion euro in the 2007-2015 period. The absolute decrease of investment almost corresponds to the 300 billion of the Juncker Plan announced by the European Commission (European Commission 2014). Therefore, the share of investment on the GDP has substantially decreased from 22,9 per cent to 20,0 per cent. The fall of investment by the private firms, the households and the governments is the main factor which has determined the economic crisis in Europe. In the same period, the fall of investments (-12,3%) represents the most important negative factor (-2,82%) on the growth of the GDP (0,7%), compensating the positive role of personal consumption (0,27%) and of net exports (2,48%). In fact, the increase of exports (19,3%) has been partially compensate by the large increase (13,4%) of imports.

It is important for economic policies to identify the factors, which have determined the decrease of investments and those which may promote them. In fact, the firms prefer to hold large cash balances in the banks or to invest in public bonds. Other firms do not invest in new capital assets but prefer to buy back their own shares and to distribute high dividends, thus transferring the benefits to the shareholders, in order to avoid hostile takeovers, and to the managers through the stock options. Greenfield investments aimed at expanding the companies inside the country into new productions fields are much lower than the acquisitions of competing firms in the same production field especially abroad. Moreover, the shareholders often do not invest the proceedings of the sales of their companies in order to acquire other companies but rather buy financial assets. In the meantime the crisis of many large firms and the closure of many productive plants continue, leading to a decrease of the production capabilities.

The balance on current transactions of the Euro area with the rest of the world (National accounts) measured as a percentage of gross domestic product at market prices has been always positive and it is increasing since 2008 as it has been 3,7 per cent in 2015. This surplus of the trade balance of goods and services in the Euro area and especially in Germany (8,8%) and also in Italy (2,2%) indicates that the internal demand is lower than the internal production or that saving is greater than investments. In fact, at the global level, both in developed and in emerging economies, there is an enormous gap between saving and investment and that is due to the deleveraging process occurring in the balance sheets of the no financial companies, of the banks, of the governments and also of the households. However, in the long term a low investment decreases the growth of the internal production capacity. This surplus of saving on investment indicates that the economic growth could have been much greater if the actual austerity policies would not have decreased the internal demand.

In the Euro area, the GDP growth rate is very low and a long-term stagnation characterizes many European countries. As indicated by the European Commission: "The ongoing recovery remains driven by domestic demand and in particular, by private consumption" (Source: European Economic Forecast, Winter 2016). In fact, net exports will have an almost zero impact on future growth in European Union in the period 2016-2017. Thus, the future growth will be determined by the internal demand and not by exports and the forecast of an higher GDP growth in the coming years highly depends on a future increase of the investment, capable to invert the past trends.

Globally (excluding the EU), the growth rate for imports of goods and services likely bottomed out at an estimated 0,5% in 2015, their lowest level since 2009. This largely reflects the lower trade intensity assumed to prevail in emerging markets, where trade and its responsiveness to growth has

been slowing for a number of years (European Commission 2016). In the past the GDP elasticity of world trade was very high, but in recent years (after 2015) the ratio of world trade on global GDP has decreased. Key factor of this change has been the fall of the price of oil and of raw materials, as that has sharply decreased the value of the export/import flows and in particular the export revenues of emerging economies. That has had a negative impact on their GDP growth and their imports from the most developed countries. In fact, the process of trade globalization has stopped and the *reshoring* of productions seems to become increasingly important. At the same time, the domestic demand is also becoming increasingly more important than the exports to distant foreign markets. In particular, the growth of the European economy should depend on the internal demand, as the European economy represents the largest economy in the world and it is difficult to imagine that the other countries could significantly increase their imports from the EU, in order that exports may become the main driver of the long term growth of the European economy.

This article first illustrates a simple macroeconomic model of growth led by the internal demand and it indicates why investment in new sectors can determine an increase of the GDP, also in a short-medium term perspective, given an equilibrium constraint in the balance of payment. Then, it illustrates in which sectors investments should be concentrated, by distinguishing between an export oriented sector and a domestic sector addressed to the internal demand. These domestic productions should aim to satisfy the increasing service needs of the citizens and the firms.

The article also clarifies the territorial impact of this policy for the urban areas in Europe, as also the problems and factors of innovation which can promote investment decisions. That allows indicating that this theoretical approach has important policy implications in defining the characteristics of a "new industrial policy", which qualifies itself as the necessary complement to the traditional public budget and monetary policies in Europe.

1. The relationship between investment, GDP growth and the balance of payment.

Nearly three and a half decades ago, Thirlwall (1979 and 2011, Mc Combie 1981) first promulgated his "rule," or "law" as it has now become known, which indicates that the maximum sustainable growth of a country or the balance-of-payments constrained growth rate is explained by the equation:

$BP = x/\pi = \varepsilon z/\pi$

where x is the growth of the volume of exports, π is the domestic income elasticity of demand for imports, ε is the world income elasticity of demand for exports, and z is the growth of world income. The expression has also been defined as the dynamic Harrod's (1933) foreign trade multiplier.

Both the Harrod's and the Thirlwall's models do not consider the role of investment. In order to indicate the role of this latter both on the demand and the supply side of the economy, we may first investigate the same problem considered by the Harrod's multiplier model or aim to find the value of ΔY which allows that ΔX - ΔM =0.

However, we may suppose a different structure of the economy. In particular, consumption may be distributed between a domestic good (C_2), which can be only internally produced and can't be exported, and a international good (C_1), which may be imported and also exported. In particular, the domestic good (C_2) may represent those goods and services, which can't be imported and aim to satisfy increasingly diffused needs, such as those of housing, mobility, health and education, leisure and culture, energy saving and environmental protection. These goods and services represent

"collective goods and services", but they may also be produced by private firms and not only by public organizations. Moreover, they can represent "public goods", produced by the government and indicated as the "public consumption" in national accounting. According to these definitions the model can be represented by the following six equations (Cappellin 2012):

$\Delta \mathbf{Y} = \Delta \mathbf{Y}_1 + \Delta \mathbf{Y}_2$	(a
$\Delta \mathbf{Y}_2 = \Delta \mathbf{C}_2$	(b
$\Delta C_2 = c_2 \Delta Y$	(c
$\Delta C_1 = c_1 \Delta Y$	(d

$$\Delta \mathbf{M} = \mathbf{m} \ \Delta \mathbf{C}_1 \tag{e}$$

$$\Delta \mathbf{X} = \Delta \mathbf{X}^*$$

Proceeding as in the Harrod's model we have that:

 $\Delta X \text{-} \Delta M = 0$

 $\Delta X - m c_1 \Delta Y = 0$

 $\Delta \mathbf{Y} = \Delta \mathbf{X} / \mathbf{m} \mathbf{c}_1$

This last equation indicates that, given the equilibrium of the balance of payment as in the original Harrod's model, the increase of income should be equal to the increase to export divided by the propensity to average import, which in this model is determined by multiplying the propensity to consume of the international good (c_1) by the propensity to import of this latter (m).

(f

This equation can also be written as:

 $c_1 * \Delta Y = \Delta X / m$

which indicates a negative relationship or a trade-off between (ΔY) and (c_1) , if both (ΔX) and (m) are constant. Thus, the GDP is higher, the lower is the propensity to consume the international good.

According to this model the policy makers should aim to increase the production of the domestic good (Y_2) since it would increase the GDP. However that would lead to a deficit of the balance of payment. Therefore, if the policy-maker wants to respect the balance of payment constraint, he could reorient the pattern of consumption (c_1/c_2) toward the domestic good. For example, this latter may be provided either free of charge or at a lower price in order to induce the consumers to substitute the consumption of the international good (C_1) .

A second model may be proposed in order to represent the case, when the policy-maker is not only willing to act on the pattern of the final demand, but he is also capable to orient the supply of the economy. In fact, the above indicated Harrod's constraint to growth depends on the one hand on the competitiveness of the exports (X) produced by the exporting sectors (Y_1) and on the other hand on the capability of production of the domestic sector (Y_2) . In this perspective, it is interesting to investigate the most appropriate distribution of investment between the export sector and the domestic sector. Therefore, we may suppose that an increase of investment (I) does not only

increase the aggregate demand through the Keynesian multiplier and lead to an increase of import (M), but it may also increase the competitiveness of exports or it may create a new production capacity in the domestic sector. This second model can be represented by the following equations:

$\Delta \mathbf{Y} = \Delta \mathbf{Y}_1 + \Delta \mathbf{Y}_2$	(1
$\Delta \mathbf{Y} = \Delta \mathbf{C}_1 + \Delta \mathbf{C}_2 + \Delta \mathbf{G} + \Delta \mathbf{I} + \Delta \mathbf{X} - \Delta \mathbf{M}$	(2
$\Delta \mathbf{C} = \mathbf{c} \left(\Delta \mathbf{Y} - \Delta \mathbf{T} \right)$	(3
$\Delta C_2 + \Delta G = \Delta Y_2$	(4
$\Delta C_1 = \Delta C - \Delta C_2$	(5
$\Delta \mathbf{I} = \Delta \mathbf{I}_1 + \Delta \mathbf{I}_2$	(6
$\Delta I_2 = s \Delta I$	(7
$\Delta I_1 = (1-s) \Delta I$	(8
$\Delta \mathbf{Y}_2 = \mathbf{k}_2 \Delta \mathbf{I}_2$	(9
$\Delta X = k_1 \Delta I_1$	(10
$\Delta M = m \ \Delta C_1$	(11
$\Delta \mathbf{Y} - (\Delta \mathbf{C}_1 + \Delta \mathbf{C}_2) + (\Delta \mathbf{T} - \Delta \mathbf{G}) - \Delta \mathbf{I} = \Delta \mathbf{X} - \Delta \mathbf{M}$	(12
IRR (ΔI) = r* + risk premium*	(13

IRR = f(R&D, education, project design)

In this model, total consumption is a function of disposable income (equations 3, 4, 5) and it is distributed between the domestic good (ΔC_2) and the international good (ΔC_1). Therefore consumption of the domestic good should be equal to the production (ΔY_2) of the same good and the companies in this sector should either be financed by the prices paid by the individual consumers or by eventual subsidies given by the government, indicated by public consumption (G) which requires greater taxes (T).

The value of total investment (ΔI) is given by the condition that the internal rate of return (IRR) of the investment projects by the companies should be equal to the interest rate (r) plus a risk premium determined by the macroeconomic conditions and the risk aversion of the individual companies. The (IRR) depends also on "creativity" of the companies or on innovation adoption since these latter would affect the expected revenues and costs of the investment projects. The policy makers together with the individual companies can determine the parameter (s), which indicates the share on total investment of the domestic (ΔI_2) sector and of the international (ΔI_1) sector. Moreover, In this model differently from the previous model, which is based on the Thirlwall-Harrod's model, the government can also decide the level of public consumption (G) and of taxation (T).

From the previous equations, the equation (12) can be derived, which indicates that the deficit of the balance of payment (X-M) should compensate an eventual surplus of investment over the internal, private and public, saving. Clearly, a continuous deficit of the balance of payment is not sustainable

(14)

in the long run, since it would lead to an increase of the foreign debt and to an increase of interest rates and finally to a financial default. That also implies that, when the balance of payment is in equilibrium, all investment is financed with internal saving.

In the model, the exports (ΔX) depends on the investments (ΔI_1) targeted to the increase of the production capacity in the exporting sector. On the other hand, the production of the domestic sector (ΔY_2) is determined by the share (s) of the total investment (ΔI), which is devoted to the domestic sector (ΔI_2). The productivity of the investments in the exporting sector and in the domestic sector are indicated respectively by the parameters k_1 and k_2 .



The model indicates that investments operate both on exports (I_1) and on the production of the domestic sector (I_2) , as indicated in table 1. If the production of the domestic sector (Y_2) increases, then consumption (C_2) of the domestic good increases, while the domestic consumption (C_1) of the export good and its import (M) decrease and both the GDP and the surplus of the balance of payment increase.

From these equations it is possible, first of all, to calculate the impact of an increase of investment (ΔI), to be distributed between the two sectors, on the change of GDP and then to examine the impact of the same investment on the balance of payment.

According to the Keynesian multiplier in an open economy, the impact of investment on the GDP is positive and it is directly related to the propensity to consume (c) and inversely related to the import propensity (m). In fact, by substituting the various variables in the equation (2), we obtain:

$$\Delta \mathbf{Y} = \mathbf{c} \ \Delta \mathbf{Y} - \mathbf{c} \ \Delta \mathbf{T} + \Delta \mathbf{G} + \Delta \mathbf{I} + (1-s) \ \Delta \mathbf{I} \ \mathbf{k}_1 - \mathbf{m} \ \mathbf{c} \ (\Delta \mathbf{Y}) + \mathbf{m} \ \mathbf{k}_2 \ \Delta \mathbf{I} \ \mathbf{s}$$

If we suppose that $(\Delta T = \Delta G = 0)$, we obtain the value of the investment GDP multiplier:

$$\Delta Y / \Delta I = [1 + (1-s) k_1 + m k_2 s] / (1-c + mc)$$
(15)

Therefore in this model differently from the previous model, the investment GDP multiplier depends not only on the propensity to consume (c) and on the propensity to import (m), but also on

the distribution of investment between the exporting sector (1-s) and the domestic sector (s). In fact, an increase of the investment in the exporting sector is leading to an increase of the exports and then of the aggregated demand. Moreover, an increase of the investment in the domestic sector (s) would lead to a decrease of imports and then also to an increase of the aggregate demand. In fact, a greater investment in the domestic sector would lead to an increase the consumption of the domestic good and this latter would substitute the consumption of the international good and then lead to a decrease of the imports, which has a positive impact on the internal demand and the GDP.

It is also interesting to analyse how the value of the investment multiplier is affected by the share of investment (s) in the domestic sector and we may calculate the derivative with respect to (s):

$$\delta \left(\Delta Y / \Delta I \right) / \delta s = m k_2 - k_1 > = <0 \tag{16}$$

if $m k_2 > = < k_1$

That indicates that an increase of the share of investment in the domestic sector (s) may determine an increase of the income multiplier, if the productivity of capital in the domestic sector (k_2) multiplied by the propensity to import (m) of the international good is higher than the productivity of the capital in the exporting sector (k_1) . In fact, an increase of (s) would decrease the import and increase the internal demand but it would also decrease the export.

We may also compute and compare the values of the investment multiplier in the two extreme cases of s=0 and s=1 ($\Delta Y/\Delta I_{s=1}$; $\Delta Y/\Delta I_{s=0}$). In fact, if s =1 and all investment goes to the domestic sector the expression (15) is:

$$\Delta Y / \Delta I_{s=0} = (1 + k_1) / (1 - c + mc)$$
(17)

and if s = 0 and all investment goes to the foreign sector the expression (15) is:

$$\Delta Y / \Delta I_{s=1} = (1 + m k_2) / (1 - c + mc)$$
(18)

Clearly:

 $\Delta Y / \Delta I_{s=0} > = < \Delta Y / \Delta I_{s=1}$ if $(1 + k_1) - (1 + m k_2) > = < 0$

or if $(k_1 - m k_2) > = < 0$

These results coincide with the indication of the equation (16), which indicates that, if the productivity of investment on exports is low ($k_1 < m k_2$), then the value of $\Delta Y/\Delta I$ increases when (s) increases.

Therefore, if all investment is allocated to the exporting sector (s = 0), that may determine a greater income than in the case that all investment is allocated to the domestic sector (s = 1), only if ($k_1 > m k_2$). Otherwise, if ($k_1 < m k_2$), it is more convenient to allocate most investment to the domestic sector, since on the one hand the productivity of investment on export is low and on the other hand by allocating the investment to the domestic sector it would be possible to greatly decrease the import and that has also a positive impact on the GDP.

Clearly, the value of the marginal propensity to import and the values of the productivity of investment in the two sectors are an empirical question, depending on the specific sector, countries or regions and period to be considered. However, in a modern economy we may suppose that the process of globalization has greatly increased the marginal propensity to import, due to the

increasing competitiveness of external productions. Moreover, increasing complexity of technology has made increasingly difficult to develop completely new products to be international competitive and that implies a greater intensity of capital or a lower (k_1) capital productivity of the export sector. That is also determined by the increasing international competition and by the actual slow growth of the emerging countries and of the international trade.

On the contrary, the high labour intensity of the domestic sector, which is made mainly by service related sector, implies a rather high productivity of capital (k_2). Thus, we may suppose that the condition ($k_1 < m k_2$) is generally verified in the most modern economies, such as those in Europe. Therefore, an increase of the distribution of investment (s) in favour of the domestic sector (Y_2) should usually determine a greater increase of GDP, since it decreases the values of imports and it increases the internal demand by substituting the internally produced goods to the international goods.

As anticipated above, it is important to consider the balance of payment since in a long term perspective it is necessary for an economy to have an equilibrium of the balance of payment. In fact, a continuous deficit of the balance of payment, due to the fact that the internal demand is greater than the internal supply, would lead to a continuous increases of the external debt and that is not sustainable since the spread on interest rates would increase and the foreign creditors may finally decide to withdraw their loans and lead to a default or pretend to exchange their credit with real properties in the considered country, such as it has occurred in the case of the privatization of public infrastructures in Greece. On the other hand, a permanent surplus of the balance of payment, such as in Germany and China, would lead to a continuous increase of the official reserves of the Central Bank. That may be appropriate according to a "mercatilistic" ideology or for increasing international political power of the country, but it would not be economically convenient since the country could either increase the public investment and deficit or increase the private investment thus leading to a greater GDP and to an increase of the well-being for its citizens, if there is a lack of public infrastructures and an almost saturation of many traditional and material goods.

The analysis of the impact of an investment increase in the model may be extended by considering the balance of payment constraint, as indicated by Harrod and Thirlwall. Thus, the condition:

$$\Delta X / \Delta I = \Delta M / \Delta I$$

can be rewritten considering the equations (10), (11), (5), (3), (4) and (9) as:

 $\mathbf{k}_1 \left(1 - \mathbf{s}\right) = \mathbf{m} \, \Delta \mathbf{C}_1 / \Delta \mathbf{I}$

 $\mathbf{k}_1 (1 - \mathbf{s}) = \mathbf{m} \left(\Delta \mathbf{C} - \Delta \mathbf{C}_2 \right) / \Delta \mathbf{I}$

 $k_1 (1 - s) = m c \Delta Y / \Delta I - m k_2 s$

and by substituting the expression $\Delta Y/\Delta I$ indicated in equation (15) above, we obtain an expression of the balance of payment:

$$\Delta X/\Delta I - \Delta M/\Delta I = k_1 (1 - s) - m c [1 + (1 - s) k_1 + m k_2 s] / (1 - c + mc) + m k_2 s$$
(21)

It is therefore interesting to examine the change of the balance of payment with respect to an increase of the share of investment in the domestic sector (s) or to calculate the derivative of the surplus of the balance of payment with respect to (s):

$$\delta (\Delta X/\Delta I - \Delta M/\Delta I) / \delta s > = < 0$$

(20)

Taking into account the equation (21), after some elaborations we obtain:

 $\delta (\Delta X/\Delta I - \Delta M/\Delta I) / \delta s = (1-c) (mk_2 - k_1) > = < 0$

which is is positive if:

$$m k_2 > = < k_1$$

or
 $m > = < k_1 / k_2$ (22)

This condition is identical to the above condition (16), which indicates the derivative of $\Delta Y/\Delta I$ with respect to (s). Therefore, the balance of payment improves when (s) or the share of investment allocated in the domestic sector increases, if (m k₂ > k₁). In fact, an increased production in the domestic sector determined by the investment in this sector would lead to a decrease of the import, which is greater than the decrease of the exports to be determined by an equal decrease of investment in the export sector.

The two expressions (22) and (16) indicate that the impact on the balance of payment and on the GDP by an increase of investment depends on the distribution (s) of investment between the domestic and the exporting sector or on the relative productivity of investment in the domestic (k_2) and in the export sector (k_1) and on the marginal propensity to import (m). The expressions (22) and (16) are clearly similar to the Thirlwall's law of growth, which establishes a relationship between the growth rate of GDP and the growth of exports and the propensity to imports. Therefore, we may call these conditions (22) and (16) the "Cappellin's law" of the impact of investment on the balance of payment and on the GDP growth.

It results that it is convenient to invest in the domestic sector (I_2) if $m > k_1/k_2$ or :

- a) if the productivity of capital (k_2) is high in the domestic sector and
- b) if the propensity to import (m) the export good is very high and
- c) if the investment in the export sector (I_1) has a low productivity (k_1) or impact on the volume of exports.

If the condition $(m > k_1/k_2)$ is satisfied, an increase of the share (s) of investments in the domestic sector (I₂) has a positive impact both on the balance of payment and on the GDP.

We may also conclude that when the productivity of capital in the domestic sector is high and the propensity to import the foreign good is also very high, while the productivity of capital in the exporting sector is relatively lower ($mk_2 > k_1$), then an increase of investment and production in the domestic sector have a positive effect both on the GDP and on the balance of payment.

Therefore, differently form the Thirlwall and Harrod's model, an important conclusion of my model is that, when the share of investment in the domestic sector increases, there is not a trade-off between the growth of GDP and the surplus of the balance of trade, as they both will increase or decrease, provided that the condition $(mk_2 > k_1)$ is satisfied.

Since the two derivatives of the GDP and of the balance of payment with respect to the share (s) are linear and have both a positive slope (if $mk_2 > k_1$) or negative slope (if $mk_2 < k_1$). The level of (s) which leads to the maximize the GDP and the surplus of the balance of payment is an extreme value: either s=1 in the case of $mk_2 > k_1$ or s=0 in the case of $mk_2 < k_1$, as indicated in the figure 1.

The figure 1 considers the most common case in the developed countries $(mk_2 > k_1)$ and it indicates the values of the GDP and of the balance of payment in the two situations, when s=0 and s=1, and it indicates also the specific value s*, which insures an equilibrium of the balance of payment. The figure 1 indicates the income line, which has a slope:

 $\delta \left(\Delta Y / \Delta I \right) / \delta s = m k_2 - k_1 > 0$

and it also indicates the balance of payment line, which has a slope:

 $\delta (\Delta X/\Delta I - \Delta M/\Delta I) / \delta s = (1-c) (mk_2 - k_1) > 0$



Figure 1 – The impact of investment in the domestic sector on the GDP growth and the balance of payment if $m > k_1/k_2$

Therefore, the two objectives of the internal growth and of the surplus of the balance of payment (or the decrease of an external deficit) are not conflicting each other. If $(mk_2 > k_1)$ an increase of the share of investment in the domestic sector would lead to an increase both of the GDP and also of the improvement of the balance of payment, while, if $(mk_2 < k_1)$, an increase of the share of investment in the domestic sector would lead to a decrease both of the GDP and also of the surplus of the balance of payment.

Finally, we may compute the value of the share of investment (s^*) between the domestic and the exposed sector, which is leading to equilibrium of the balance of payment. Since the share of imports on GDP and the value of exports are not fixed in my model, differently from the Thirlwall-Harrod's model, the optimal value (s^*) depends on the effect of investment both on the production of the domestic good or the imports and on the supply of the export good. In fact, from the expression (21), it is possible to derive that:

 $\Delta X / \Delta I - \Delta M / \Delta I = 0$ if $s^* = [k_1 (1 - c) - mc] / (k_1 (1 - c) - m k_2)$

Therefore, given the value of (s^*) which allows the equilibrium of the balance of payment, if the economy has a deficit it is necessary to return to an equilibrium, while if there is a surplus it is convenient to increase the public expenditure in order to insure a further increase of GDP and to reduce the surplus of the balance of payment.

However, the model indicates that when $(mk_2 > k_1)$, there is not an incentive to choose an intermediate share (s*), determining the equilibrium of the balance of payment since both the GDP and the surplus of the balance of payment could be increased by increasing (s). In particular, if the balance of payment is positive when the GDP has reached the highest level, then the policy maker could decrease the surplus of the balance of payment by increasing the value of the public expenditure (G), and that would lead to a further increase of GDP.

The value of (s^*) which insures an equilibrium of the balance of payment is normally intermediate between 0 and 1. By calculating the derivatives of the value of the share of investment (s^*) , which insures the equilibrium of the balance of payment, with respect to the various parameters of the model, it is possible to verify that it varies as anticipated by economic logic.

 $\begin{array}{l} \delta \; s \; / \; \delta \; k_1 \! > \! 0 \\ \delta \; s \; / \; \delta \; k_2 \! < \! 0 \\ \delta \; s \; / \; \delta \; c \; < \! 0 \\ \delta \; s \; / \; \delta \; c \; < \! 0 \\ \delta \; s \; / \; \delta \; m < \! 0 \end{array}$

In fact, when the productivity of investment in the exposed sector (k_1) is higher, that leads to an increase of exports and the equilibrium of the balance of payment requires a corresponding increase of the imports. That requires the increase of (s^*) and of the investment (I_2) and the production (Y_2) in the domestic sector.

When the productivity of investment in the domestic sector (k_2) is higher, that leads to a decrease of imports and the equilibrium of the balance of payment requires a corresponding decrease of imports determined by a decrease of the share (s) of investment (I₂) in the domestic sector.

When propensity to consume is higher, that leads to an increase of imports and the equilibrium of the balance of payment requires a corresponding increase of exports or an increase of the investment (I_1) in the exporting sector and a decrease of the share (s) of investment (I_2) in the domestic sector.

Finally, when the propensity to import (m) is higher, that leads to an increase of imports and, as in the previous cases, the equilibrium of the balance of payment requires a corresponding increase of exports or an increase of the investment (I_1) in the exporting sector and a decrease of the share (s) of investment (I_2) in the domestic sector.

In fact, the model indicates that the share of investment in the domestic sector (s) may have only an extreme value (0 or 1). That depends on the hypothesis that the productivity in the two sectors (k_1 and k_2) are constant and on the hypothesis that all increased production of the domestic good is totally consumed and leads to a corresponding decrease of the consumption of the international good. In reality, various reasons may explain why total investment will be shared between the two sectors and the share (s) has an intermediate value. First of all, the domestic sector and the export sector correspond to two different social economic groups of actors and they will bargain and lobby with respect to the policy makers (i.e. government and banks), in order to insure a more balanced distribution of the available financial resources.

Second, the productivity of capital in the two sectors may indicate decreasing returns, as it is difficult to find efficient investment projects aiming to increase the exports or to produce domestic goods highly demanded by the citizens. In fact, the innovation capabilities of the economic actors in the two sectors are limited or each actor is naturally induced to invest mainly in the same sector where he has traditionally operated and often there are not enough profitable investment projects to be financed. For example, if the exports volume is very high, as in the case of the export of German cars, a further increase of the exports would require massive investments in technology and commercial distribution abroad and it would be more convenient to reorient the investment effort to the internal market, as for expanding the renewable energies or for reducing the congestion in the cities and motorways. Finally, also the demand by the consumers may depend on the relative scarcity of the export of domestic good to be considered, due to the existence of a decreasing

marginal utility, and that may decrease the willingness to pay by the user, the revenues of the firms and the relative profitability of investment projects in the domestic and the international sector.

Finally, the Harrod-Thirlwall's law: $(\Delta X = (m c) * \Delta Y)$ is not valid and the growth of GDP is not determined by the exports (X) and the propensity to import (m), as the GDP growth may be increased by the investment either in the export or in the domestic sector. In particular, differently from the Harrod-Thirwall model in my model a) the growth of the exports (X) is not exogenous, but it is determined by the national investment in the export sector (I₁) and b) the growth of imports depends on the investment in the domestic sector (I₂).

Therefore, the GDP growth depends on the distribution of investment decided by various actors, such as the companies, the banks and the policy-makers between the two alternative strategies: a) an export led strategy leading to an increase of the investment in the export sector (I_1) , b) an import substitution strategy, leading to an increase of the investment (I_2) and the production in the domestic sector (Y_2) and to a decrease the imports (M).

The use of expansionary monetary policy and the decrease of interest rates have been uncapable to stimulate the investment of the companies, while the model indicates that the government has two basic instruments of industrial and regional policy: a) to adopt various fiscal subsidies and other measures which may affect the distribution (s) of fixed investment in order to increase the production capacity in the export sector or in the domestic sector, b) to increase those immaterial investments in R&D, education levels of the labour force and the project design of the companies and planning effort, which stimulate the adoption of innovation and the flow of knowledge, aiming to increase the productivity of capital (k_2 and k_2) or the profitability (IRR) of the investment by the private firms in the various sectors.

2. The microeconomic factors for the recovery of the internal demand

The macroeconomic model described in the previous section indicates that GDP growth depends on investment, since this latter affects the production both in the exporting sector and in the domestic sector. It indicates the crucial role of the domestic sector, which is oriented to the internal market, and the conditions which allow a balanced economic growth allowing the equilibrium of the balance of payment. Therefore, it important to examine in a more rigorous way the nature of these local economic activities, the temporal phases of their development, the territorial context where they develop and the actors who should promote them. In fact, it is not sufficient to design a macroeconomic growth model, which indicates the relationships between aggregate variables, while it is necessary to indicate what this model implies for an operative strategy aiming to the development of new productions in specific regional and national contexts.

According to a traditional Keynesian model, the sectors and the companies oriented to the exports and the factors of their competitiveness are the drivers of economic growth. On the contrary, according to a different theoretical framework innovation is the driver of investments and the internal demand and not the external demand could be the driver of the future economic development of the European Union. This different approach allows highlighting the endogenous, bottom-up and self-sustained character of a new development strategy in the industrial and regional policies for the European cohesion.

In particular, differently from the macroeconomic perspective which only considers the aggregate growth, there is the need to consider the change in the relative relevance between the various sectors and the process of "creative destruction" which leads to the substitution of some new activities to other traditional activities. Thus, there is the need to identify the factors of the growth

of the supply and of the demand of the new productions, as also the factors which affect the investment capable to expand the production capacity in the various sectors and how the banks and the other financial institutions could finance these investments. Finally, it is crucial to define the factors, which lead to the territorial concentration at the national and European level of the new sectors of specialization.

Economic growth depends on the investment choice between different sectors and on the selection of new "smart specializations" (Boschma 2016, Foray 2015, McCann and Ortega-Argiles 2013). The strategic factor is not only the international demand, but also the internal potential demand or the emerging needs by the citizens. The true drivers of growth in a new industrial policy are knowledge, investments, the new preferences of the users and the governance of the changes and of the relationships between actors.

As indicated by the product life cycle model, the economic growth is linked to the sequence of many different innovation waves, which determine the creation, growth and decline of new productions, characterized by an increase of labour productivity with respect to the previous productions and the creation of new employment. That leads to the increase of wages and incomes and also of the internal demand in the country and this latter drives the investment by the companies. In the early stage of the product life cycle, the development of new sectors requires major investments and various forms of financing, such as: public funds and venture capital. Later, in the development phase of the product life cycle, investments are financed by equity and bank credit. Finally, in the maturity phase of the product life cycle, corporations have to decide whether just to rationalize the existing productions and to disinvest or rather to reconvert and to create spinoff in new productions, which require more investments. Only the firms which have the required entrepreneurship capabilities can do spin-offs, the acquisition of new innovative firms and can diversify into new "smart specializations". Therefore, the lack of development of new productions after the boom of the internet economy at the turn of the century is most probably the factor behind the decline of the capital expenditure of the companies in all countries, even more than the effect of the financial crisis of subprime assets and of sovereign bonds.

As indicated in the above illustrated macroeconomic model and also in the product life cycle model the change in the structure of the final and intermediate demand and of the sectorial structure of the economy is the factor leading to the economic growth. The preferences of the consumers shift from goods exported in the international markets to services and infrastructures, which are mainly addressed to the domestic market. The development of "disruptive" technologies creates new production opportunities and the market of these new productions is not created, as in the past, by the general growth of GDP, but rather by the gradual substitution of new productivity of labour and also are less capable to satisfy the changing needs of the citizens (Markusen 2007, Markusen and Schrok 2009, Cappellin 2011 and 2012). The process of "creative destruction" works on the supply side, with the transfer of production factors: labor and capital, from the traditional productions to the mark side with the shift of consumption fron traditional goods and services to innovative goods and services.

The demand of the new productions is becoming more customized or segmented, as the product innovations are mainly "demand led" or driven by the change in the behaviours of the most expert users (*lead users*) (Von Hippel 1994), which pull the demand of the other more traditional users (*followers*). This increasing differentiation of the demand is the result of the need of a tight interaction between the producer and the user and between the goods and the services, which have to be produced nearby and even with the tight collaboration of the user, as it is typical for the service productions. The evolution of the demand is crucial for the investment decision of the companies and often successful new productions have developed by following the evolution of the

demand of existing users, rather than by developing potentially useful applications of new technologies and by looking for distant markets.

At the same time the shift from an industrial society to a knowledge society is characterized by a shift from individual to "collective goods" or "common goods". In fact, the demand of individual goods is almost saturated, while the demand of collective goods and services, which are addressed to specific local, social, age and cultural groups of consumers or citizens, is still largely unsatisfied. Due to the collective nature of the new productions, the individual demands should first be aggregated by the producers in order to create new "*lead markets*", which may allow the efficient production of the new goods or services not only by public organizations but also increasingly by private companies. In fact, while the production of these services was traditionally reserved to public institutions the growing demand, the increasing specialization of the citizen's needs and the development of new technologies and forms of organization has led to the development of an increasing number of private firms working for the market in the productions indicated above.

The new productions should respond to the to the increasing needs by the citizens, such as those of: a) housing, b) mobility and logistics, c) free time and leisure, culture, sport, tourism media, d) health, wellness and education, e) environment and energy saving. Moreover, these new service productions may drive the development of new manufacturing supply chains or clusters, both within the specific urban areas and also at the national and international level (Cappellin et al. 2014 and 2015).

The economic relevance of these productions is highlighted by the following data. The percentage of employment in industry except construction on total employment was just 14,9 in the Euro area in 2015 and it is decreasing since it was 18,6 per cent in 2000. Moreover, final consumption expenditure and gross capital formation represented 96,1 per cent of GDP in 2015 and Exports-Imports of goods and services only 3,9 per cent (European Commission 2016). The importance of these activities for the future development of the European economy is underlined, for example, by the fact that the high congestion within the cities determines the loss of many working hours and it requires major investment in the improvement and expansion of transport infrastructures. The large unused rail areas in highly accessible urban sections could be used for expanding affordable housing, which is required by the demographic shifts and the large immigrations from outside the European Union, or for creating green areas and improving the environment and quality of life in many European cities.

These productions are specific example of the domestic sector (Y_2) indicated in the macroeconomic model above. The reconversion toward these new "smart specializations" has the advantage that these productions seem to have an high income elasticity and are not subject to external competition, as they have to be produced very close to the final users and require a strong interaction between the user and the producer. Moreover, the development of these new productions for the internal demand would exploit the comparative advantage in these productions, existing in Europe with respect to less developed countries, due the higher experience and skills accumulated in these productions during the past decades.

In the future, these new productions, first developed for the European market, could promote the development of investments by European firms in foreign countries, in order to supply similar goods and services in these countries. Thus, the internal European market, which accounts 500 million of consumers, represents an alternative to the new markets in distant countries, and the driver of the growth of the European firms may be represented by the demand of new products and services determined by the increasingly sophisticated needs of the European citizens and firms.

A sustainable urban environment requires major investments in the cities and it would also lead to the development of many new modern productions. The economic growth depends on a dynamic process in which the demand and the supply of the new productions interact between them (Cappellin 2014a and 2014b). In fact, the creation of new production capacity into innovative collective products and services by the most innovative firms stimulates the final demand by the consumers or the intermediate demand by the companies, to experiment these goods and services. The individual market demand can't lead to the development of these new productions by itself and the demand is logically revealing itself after the creation of the supply. The new needs of the users determine the market demand and that drives the companies to modify their traditional production specializations. Firms should anticipate the emerging needs of the specific communities of innovative users (*lead users*) and be willing to do large investments in order to create the new production capabilities, which are required in order to satisfy the user needs.

These new productions are linked between themselves and they are complementary in the use and also in the production, as for example housing is linked to mobility and to the services provision. The development of horizontal and vertical integration between the various firms and sectors is very important. In fact in the case of the new services, specific segments of users and of producers often tightly collaborate in the introduction of the innovation (Fagerberg 2005, Capello 2007, Cappellin and Wink 2009) and tacit knowledge and asymmetric information represent key strategic production resource and determine the evolution both of the demand and the supply of the various productions. Therefore, industrial and regional policies should promote the tight integration of the users and the producers.

The new specializations of the firms develop into the new contiguous technological domains (Boschma 2016), as the process of horizontal and vertical integration between the various firms is important. The new lead markets and new productions are not completely new vertical sectors, separated from the other vertical sectors, but rather new complex and localized production complexes, characterized by the horizontal integration of various production technologies and capable to respond to the various complementary needs by the users.

Therefore, a second factor of the crisis of capital expenditure in developed countries, beside the lack of development of new sectors, is the fact that the nature of investment has changed. First of all many immaterial investments (R&D and technical design and organizational innovations) are not captured by the existing macroeconomic statistics and they are often considered as part of the current expenditure of the companies, as they have a short life span and can't be depreciated in various periods. Moreover, as highlighted by the six "lead markets" indicated above, there is the need of very large and innovative and complex investments, which are beyond the current management, technical and financial capabilities of the individual small firms. The new investments require the cooperation between various firms, which operate in different sectors and have complementary competencies and are capable identifying a common operative goal and to create strategic alliances and are characterized by trust relationships, common cultural models and modern legal governance instruments.

Innovation can't be done in isolation and large innovative projects depend on the investments of the individual firms in the internal R&D activities and labour skilled resources, on the collaboration with the other firms in the territorial clusters and in the sectorial supply chains, on the collaboration with the universities and on the collaboration with the citizens in the territory and the local public institutions.

In general, the new industrial economy based on knowledge and the progress of information and communication technologies is characterized by a decrease of the transaction costs, the coordination times and the various actors and firms work in a synchronized way and "just in time" and that leads

to a shortening both of time and space. The interdependencies of the firms at the regional, national and international level and the role of external economies are increasing and that leads to tighter relationships of the companies with the final users, the financial intermediaries and the public institutions. These increasing interdependencies make the investment decisions more complex and risky. Due to the existence of various external economies and the high risk and the low expected returns of individual isolated projects, the individual private firms do not have an incentive to act alone and only public or collective actors can coordinate the various investment projects and exploit the synergies between the various private firms and that is more possible at the local scale than at the national scale.

In fact, the tight relationships between the development of modern services and the agglomeration economies determine that the cities are at the centre of the long term transformation of the national and European economy toward the model of the service economy and the knowledge society. Urban areas perform the role of incubator of innovation and attract the national and international investments. The urban agglomeration of service activities allows a tight interaction and to decrease the transaction costs, as urban areas allow a greater geographical, organizational and cognitive proximity or relatedness of the actors (Cappellin 1988, Boschma 2016). In fact, first of all, the capabilities of innovative services are higher in the urban centres, Secondly, the demand of services is concentrated in the urban areas, since in these areas the citizens are characterized by higher income levels, greater education level and due to demographic factors often have more time for leisure services than the population in no urban areas.

Territorial proximity allows connecting the individual demand of the people, but also connects the companies and allows the access to those complementary capabilities, which are required in the development of the supply of modern innovative productions. Finally, territorial proximity allows a tight interaction between the demand and the supply of innovations.

In this network perspective, it seems that the modern post-industrial city is not characterized by high rise buildings, the business headquarters or also the existence of large garden and parks for a better environment, while it is especially characterized by the increasing mobility of people during the work and in the free time and by the increasing diversity of the people and the companies, which belong to different sectors, scientific disciplines, cultural backgrounds, regional and national origins, different income brackets and social groups. These tight linkages between people are crucial for the circulation of information, the creation of new knowledge and for socialization purposes, which are key factors for a better quality of life and well-being.

Therefore, the concept of "smart cities" should not coincide with the use of advanced technologies in the cities, but rather indicate a new development strategy of the cities aiming to promote the creativity (or smart specialization) or the creation of new innovative productions and of innovation networks in the local economy and community. These changes determine the existence of new opportunities for private and public investment in the cities and may thus play a key role in increasing the national aggregate demand, the GDP and the employment level.

In a policy perspective, cities may represent the material and immaterial platforms of the processes of innovation and internationalization due to their endowment of higly qualified competencies and the capability to facilitate the collaboration between different and complementary actors (Lundvall e Johnson 1994, Cappellin 2010). In fact, the existence of well-structured production and innovation networks, of material and immaterial infrastructures and of a well-developed and stable institutional system allow a decrease of the transaction costs and of the adjustment costs to innovation (Cappellin 1988). That allows a greater flexibility and speed of the process of change, to accelerate the process of political decision making and to decrease the time of policy implementation.

Therefore, a large European investment program (European Commission 2010 and 2014) aiming to promote the economic recovery should start from the hundreds existing large and intermediate cities in the European territory. An investment program focused on the quality of life of the European citizens would be capable to have a significant and immediate effect on the GDP, but it would require the adoption of a modern multi-level governance approach and a great empowerment of local and regional self-government (Cappellin 2009). In fact, investment policies in the various cities should be based on a bottom-up approach, since to stimulate the creativity and the design capabilities in the development of high quality services and infrastructures would require to mobilize the demand, the ideas and the active participation by the citizens and the various social groups. Therefore, the local and regional institutions should create those immaterial platforms, such as forum, foundations, task forces, planning centres, which are capable to create the "missing links" between the complementary capabilities of different local actors, such as the users of the new services, the universities and research centres, the large public utilities companies and other private and public partners, leading to the development of interactive learning processes and the creation of new knowledge networks.

3. Conclusions

According to orthodox macroeconomic policies the long term economic growth depends on the evolution of the aggregate supply side of the economy. Paradoxically, the aggregate supply in a macroeconomic model does not explicitly consider the companies and the sectorial structure of the economy, but just the labour supply function. The continuous downward shift of the labour supply schedule and the increase of the cost competitiveness of exports in the international market could lead to the increase of the GDP (very similar to a "mercantilistic" perspective). These policies underestimate the role of the demand in the internal market and the various long term factors acting on the consumption and investment functions.

According to the Harrod-Thirdwall's model, the growth of an economy is limited by the export growth and the balance of payment constraint. The model of internal demand led growth presented in this article is different since it indicates that innovation affects the investments and these latter promote the GDP growth and allow to partially remove the constraints of the balance of payment, both by expanding the exports and by redirecting the internal demand toward the domestic productions thus reducing the imports. Therefore the growth of GDP is a function of innovation in the companies and of changes in the needs of the consumers, rather than only a function of the cost competitiveness of exports.

According to the model of internal demand led growth presented in this article, if the condition (m > k_1/k_2) is satisfied, macroeconomic and industrial policies and regional policies can succeed to increase both the GDP and the surplus of the balance of payment by developing the internal market and the share of the domestic sector in the national investment. In fact, macroeconomic policies, industrial policies and regional policies should aim to increase the share of investment in the domestic sectors (s), if the productivity of capital expenditure in the domestic sector (k_2) is high and if the propensity to imports (m) is high, as a greater production of the domestic goods may decrease the import of the international goods, and if the effectiveness of investment on the competitiveness of exports (k_1) is low.

The recent evolution of the European economy indicates that the slow growth of investment is the cause of the slow growth of GDP and that investment should not only be oriented to the aim of improving the competitiveness of exports, but also to the aim of expanding the production of those domestic goods and services, where the demand of citizens is continuously increasing and new innovative efficient productions for private firms and for public institutions are possible. Thus

industrial and regional policies should promote a dynamic balance between the new demand expressed by the innovative consumers and the new supply created by the innovative firms.

The investments should be oriented to those productions which aim to respond to the increasing needs by the European citizens of new modern goods and services and of better infrastructures, especially in the largest European cities. In particular, investment policies in Europe should be addressed to fill wide gap between the demand and the supply in the following modern productions and markets: 1) housing, 2) mobility, 3) health and education, 4) leisure and culture, 5) energy and environment, 6) advanced manufacturing productions, which produce the intermediate goods which are driven by those final productions.

In conclusion, the strategic priorities for an economic policy aiming to the recovery of the GDP growth rate in the European Union (Cappellin et al. 2014 and 2015) are not lower labour costs for a greater international competitiveness through an *"internal devaluation"* strategy, but rather the increase of the productivity of the economy through the reconversion or diversification towards new smart specializations, the relaunch of the medium and long term strategies of innovation and investment by the private companies, a change in the structure of the credit and financial sector, which should provide capital to the companies rather than just invest in financial assets, and finally the concentration of a large share of national investments in the cities, in order to respond to the new emerging needs of the citizens.

4. References

Boschma, R. (2016) Relatedness as driver behind regional diversification: a research agenda, Regional Studies, forthcoming.

Cappellin, R., 1988, Transaction Costs and Urban Agglomeration, *Revue d'Economie Régionale*, 2: 260-278.

Cappellin, R. (2011), Growth, consumption and knowledge cities, in *Symphonya. Emerging Issues in Management*, n. 2, 6-22.

Cappellin , R. (2012), Growth in post-industrial cities: an endogenous model, in Cappellin, R., Ferlaino, F e Rizzi, P. (eds.), *La città nell'economia della conoscenza*, Milano, Franco Angeli, 29-49.

Cappellin, R. (2014a), Growth in post-industrial cities: an endogenous model, *Karlsruhe Papers on Economic Policy Research*, Volume 34, , ISBN print: 978-3-8487-1917-4, ISBN online: 978-3-8452-6044-0, DOI: 10.5771/9783845260440_1, 505-523.

Cappellin, R. (2014b), *Innovation and investments in an urban cross-sectoral growth model: a change of course is needed in macroeconomic policies*, relazione presentata alla Riunione Scientifica della SIE – Società Italiana degli Economisti, Università di Trento, 23-25 ottobre 2014, <u>http://www.siecon.org/online/wp-content/uploads/2014/10/Cappellin.pdf</u>

Cappellin, R., Wink, R. (2009), International Knowledge and Innovation Networks: Knowledge Creation and Innovation in Medium Technology Clusters. Edward Elgar Publishing, Cheltenham.

Cappellin R., Marelli E., Rullani E., Sterlacchini A. (2014), a cura di, *Crescita, investimenti e territorio: il ruolo delle politiche industriali e regionali*, Website "Scienze Regionali", eBook 2014.1 <u>www.economia.uniroma2.it/dedi/ebook-politiche-industriali/</u>

Cappellin, R., Baravelli, M, Bellandi, M., Camagni, R., Ciciotti, E. e E. Marelli, E. (2015), *Investimenti, innovazione e città: una nuova politica industriale per la crescita*, Milano: Egea www.egeaonline.it/ita/investimentiinnovazionecitta.aspx

Capello, R., 2007, Regional Economics, London, Routledge.

Cappellin, R., 2010, The governance of regional knowledge networks, *Scienze Regionali*, Vol. 9, Issue3, 5-42.

European Commission, 2010, EUROPE 2020: a strategy for smart, sustainable and inclusive growth, Communication from the Commission, 3.3.2010

European Commission, 2014, President Juncker's Political Guidelines. A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. 15 July 2014.

European Commission (2016), European Economic Forecast, Spring 2016, ISSN 2443-8014 (online).

Fagerberg J., 2005, Innovation. A guide to the literature, in: Fagerberg J., Mowery D.C., Nelson R.R., *The Oxford Handbook of Innovation*, Oxford University Press, Oxford, 1-26.

Foray, D., 2015, Smart Specialisation: Challenges and opportunities for regional innovation policy, Routledge, Abingdon.

Harrod, R. (1933), International economics, Cambridge: Cambridge University Press.

McCombie, J.SL. (1981), "Are international growth rates constrained by the balance of payments?" *BNL Quarterly Review*, December.

Lundvall B.A. and Johnson B., 1994, The Learning Economy, *Journal of Industry Studies*, Vol. 1, Issue 2, 23-42.

Markusen A., 2007, A Consumption Base Theory of Development: An Application to the Rural Cultural Economy, *Agricultural and Resource Economics Review*, Vol. 36, *1-13*.

Markusen A. and Schrock G., 2009, Consumption driven urban development, *Urban Geography*, Vol. 30, Issue 4, 344-367.

McCann, P. and R. Ortega-Argilés, 2013, Smart specialisation, regional growth and applications to EU Cohesion Policy, Regional Studies.

Thirlwall, A.P. (1979), "The balance of payments constraint as an explanation of international growth rate differences", *BNL Quarterly Review*, March.

Thirlwall, A.P. (2011), Balance of payments constrained growth models: history and overview, *PSL Quarterly Review*, 64, 259, 307-351

Von Hippel, E., 1994, The Sources of Innovation, Oxford, Oxford University Press.