

# Global & Local Economic Review

Volume 15 No. 2

2011

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scholar, friend, colleague and a gentleman*

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Aut. Trib. PE n. 7 del 14.7.1999, No. 2/2011

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ISSN (*print*) 1722-4241 ISSN (*online*) 1974-5125

«Global & Local Economic Review» is included in JEL on CD, e-JEL and Econlit,  
the electronic indexing and abstracting service  
of the American Economic Association

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**Kumaraswamy Vela Velupillai\***

**FERDINANDO TARGETTI - IN MEMORIAM  
SCHOLAR, FRIEND, COLLEAGUE AND A GENTLEMAN**

**Abstract**

*In all of my 64 years of living I have rarely been able to say, of any of the hundreds of friends and acquaintances that have entered, and left, my personal or professional life, that any one of them left only happy memories of our encounters. Of Ferdinando Targetti I have only very happy memories - of a perennially smiling face, of an animated soul, of an engaging and engaged intellectual, of a personal friend of immense loyalty and of a generous and kind human being.*

*Not very strangely, I have a picture-perfect memory of the first time we met, 38 years ago, between the narrow space of the bookshelves that lined the copiously endowed University Library at Cambridge University. The ever-smiling face, the impeccably dressed Gentleman, the warm and firm handshake, and a friendship was born, even as my instincts confirmed that it would last - but not that it would end as abruptly as it did, with the intervention of the termination of a tenancy on time.*

*This paper is a personal, very private, tribute - albeit hopelessly inadequate - by one very ordinary academic economist, to another remarkable one. It is in the nature of our intrinsic measure as professionals that my tribute to Targetti should fall far short of what he deserves.*

*But this is almost the best I can manage, at this point in time.*

*I dedicate this paper to lovely 'Bogna', a widow before her time, a formidable personality who combined an enchanting beauty with deep intellectual interests, pursued with unusual - but, perhaps, not so for a Pole - passion.*

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*Only she will understand, and so it should be, the subtexts to my dedication to her.  
In sadness - but with memories to sustain it,  
Vela Velupillai*

Trento  
18 Luglio 2011  
Revised: 20 March 2012

**JEL CLASSIFICATION:** E02; E22; O20; O40.

**KEYWORDS:** TARGETTI'S MEMORIAM; MACROECONOMIC DEVELOPMENT THEORY.

*"And so it is with our own past. It is a labour in vain to attempt to recapture it: all the efforts of our intellect must prove futile. The past is hidden somewhere outside the realm, beyond the reach of intellect, in some material object (in the sensation which that material object will give us) of which we have no inkling. And it depends on chance whether or not we come upon this object before we ourselves must die." (Marcel Proust: Remembrances of Things Past (Penguin, 1983))*

## **1. A Personal Preamble**

*Do not go gentle into that good night,  
Old age should burn and rave at close of day;  
Rage, rage against the dying of the light.*

(Dylan Thomas)

The paper is divided into four parts, apart from this brief personal preamble, with my attempts to portray – *In Memoriam* – Ferdinando Targetti, in his incarnation as a Scholar, Friend, Colleague, and all in his characteristically Gentlemanly ways.

On Tamil New Year day, 14 April, 2008, I wrote Ferdinando and Bogna with wishes in Tamil, *without a translation*. He wrote back the

next day:

Caro Vela

Mi sa che Dante avrà un bel da fare a far spazio nel suo Inferno a tanti politici italiani.

Povero il nostro Paese che vede come innovatori e come difensori dei più deboli un partito di proprietà di un imbonitore e un partito con ideali medioevali!

Vorrei poter leggere il tuo poema Tamil che forse mi rincuorerebbe

Un abbraccio

Ferdi

He was deeply troubled by what he saw as the development of Italian society, its values, its politics, and the economics it was practicing, and for once I saw him display helplessness, even while trying to find ways to salvage something of value, in the depth of despair.

Ferdinando Targetti was an honest intellectual. He never compromised on intellectual integrity and never worked on any issue, or tried to contribute to any discussion, for the sake of 'fashion', academic, societal or political. He possessed a strength of conviction that he had arrived at with scholarship, sympathy and genuine compassion for every kind of underprivileged minority - in every walk of life.

He waxed lyrical, a few years ago, after Bogna and he visited India, purely as tourists. They did not ignore the massive and visible poverty; but they were enlightened intellectuals, with a deep understanding of cultural evolution and historical contingencies to know that societies and cultures ebb and flow. His vision of economics was intrinsically dynamic, in what we - he and I - felt was a Cambridge vision of endogenously driven evolution. The seeds of greatness, and the powers to undermine its fruits, were both intrinsic to the endogenous dynamics of a society. This vision underpinned his warm, generous and acute impressions and appreciation of the sleeping giant he thought India was - and, *ex post*, to be terribly Swedish about it, he has been proven to be amply correct.

When he told me how much Bogna and he had been mesmerised by the frescos of the majestic caves of Ajanta and I told him that he, then, must also visit the Sigiriya Fortress in my own, once salubrious Island, he promised me he would do so, as soon as possible. Alas, as a tenant

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of time, like all of us, his lease ran out before his time.

Our interests and visions were deeply influenced by the Cambridge Economics fashioned by Keynes's immediate colleagues, followers and students, who happened to be our own common teachers: Kaldor, Goodwin, Kahn, Robinson and Sraffa, at the 'old' Cambridge; but we also shared a common esteem for the economics of the Stockholm School, particularly the works of the immediate followers of Wicksell: Lindahl, Myrdal and Lundberg<sup>1</sup>; and, above all, for the extraordinary contributions of Kalecki<sup>2</sup>.

## 2. Remembrances of a Friend

"My dear *very aged* friend (but aged only as a friend, remember that you are younger than me!!),

It is always a pleasure to receive news and "scribbles" from you, which, together with your letters, are nice little pieces of English literature, which I am used to read to Bogna, pretending to be an English actor!

It is not a pleasure to see unemployed people and to have lost some of my cumulated savings, *but it is a pleasure that we, old keynesians, are vindicated by the events of the world capitalism ..... "*

Targetti to Velupillai (e-mail, Christmas day, 2008; last set of italics added)

I first met Ferdinando Targetti, *The Ambassador*<sup>3</sup>, as he was affectionately known among us, the perennially *poor* graduate students at Cambridge in the early 1970<sup>4</sup>s, on the fourth floor of the University

<sup>1</sup> I had an unfair advantage over Ferdinando on this front, being a 'Swede' ('by adoption' as Hicks once wrote to our common good friend, Guglielmo Chiodi about me).

<sup>2</sup> Contrariwise, he had an 'unfair' advantage over me on the Kalecki front, having access to Polish, not only through Bogna!

<sup>3</sup> Targetti was always immaculately and stylishly dressed, with a tie, expensive-looking jacket, perfectly creased trousers and starched shirts - in complete contrast to those like me, shabily dressed, as if the clothes on us had been bought at the nearest Church sale, and moving about in dilapidated cycles. I had never seen Targetti on a bicycle, during our shared Cambridge years, both in the early and, then, at the end of 1970s.

<sup>4</sup> To be precise, during the Michaelmas Term of 1973, when I had just arrived in Cambridge and he was already a veteran. My impression, then, was that he knew anyone worth knowing and, more importantly, knew everything worth knowing. I had very little reason to change my mind on either of these 'first impression' during the next almost four decades of our friendship.

Library, where I had 'colonised' a small table, piled up with all kinds of books and Journals. He would breeze in, know exactly which shelf he wanted to 'raid', pick up the many Journals and books he needed, and disappear again – but not without a polite and friendly greeting, a gentle, but penetrating question on what I was reading, how my research was progressing. From time to time we would go down to the basement canteen and talk about 'dis & 'dat, gossip, mostly, but also some serious interchanges about Cambridge Economics as we understood it, then.

We, neither he, nor I, had any idea that we were living in the afterglow of the *Cambridge Controversies in Capital Theory*<sup>5</sup>; we thought we were living in its *High Noon*, at its *zenith*. Of course we never even imagined that we were actually living through the last days of the demise of *Cambridge Economics in the Keynesian vein*, and were then young enough to live long enough to experience its *nadir*, too.

The bare bones of Targetti's distinguished professional career are easy enough to state in a concise form<sup>6</sup>. He was born on 1 July, 1945, in Moltrasio, in the province of Como and died on Sunday, 10 July, 2011, in Milan. He graduated from Milan's Bocconi University, from the faculty of Economics and Commerce, in 1970, and studied at the LSE and Cambridge (Pembroke College) in the early 1970. Apart from various short-term and visiting assignments at Universities in Europe and the US (Bocconi, Brescia, Castellana, Paris XIII and NYU), he spent almost his entire Professorial life at the University of Trento, from 1974, till early retirement due to ill health, in 2010.

He was on leave from his Professorial duties, during the period 1996-2001, when he was a Member of Parliament, representing the left wing 'Olive Coalition', from an electoral district of Milan.

During the last decade of his Professorial tenure at Trento, he was also associated with the University's graduate *School of International*

<sup>5</sup> The title of Geoff Harcourt's classic text (Harcourt, 1972), paraphrasing Harry Johnson's earlier work on *Some Cambridge Controversies in Monetary Theory* (Johnson, 1951-52). In a very recent e-mail to me (5 February, 2011), Targetti wrote: "In 1973, I invited Geoff Harcourt (he was my supervisor) for a tour to give conferences in the Italian universities; Pavia University invited him at the Grand Hotel. Geoff started the speech with one of his jokes, praising the generosity of Italians, because in the back of the big bed of his room, he saw the initials of his name in forged iron!

<sup>6</sup> Others abler and more familiar with his professional and personal life would, no doubt, write more finessed 'obituaries', where the full details of his career will appear, in the goodness of time.

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*Studies*, and its Director for the first five years of that period. In Spring 2011 I agreed to give the graduate course Targetti had been responsible for, at this School, only as a *moral duty* of a friend, to a prematurely departed friend, at that time 'only' in 'early retirement', and have continued for a second year, entirely because I feel – and hope – I can continue a part of the tradition he would have wanted the students to learn. Whether I have been faithful to at least a part of the tradition he believed in, and practised, is another matter.

My chosen textbook for the course was **Growth and Policy in Developing Countries** by Ocampo, Rada and Taylor<sup>7</sup> (Ocampo, et.al., 2009), an outstanding, uncompromising and unabashed Kaldor-Goodwin approach to policy-oriented macroeconomics, in direct contrast with every kind of orthodox macroeconomic development theory. Kaldor and Goodwin were more than simply our - Targetti's and my - intellectual godfathers: they became, over the years, our mentors, friends and sometime colleagues, in England and in Italy.

He co-edited, with Anthony Thirlwall, the posthumously published *Raffaele Mattioli Lectures* of 1984, by Kaldor (1996)<sup>8</sup>.

He has been a prolific contributor, in the classic pamphleteering tradition of the Neapolitan Count Carafa (Schumpeter, 1954, p. 162), to current issues in the political economy scene, in all of the leading

<sup>7</sup> Lance Taylor is, in my opinion, the true successor to the 'third incarnation of Kaldor - see §3, below - in combination with the Goodwin of the celebrated Growth Cycle (Goodwin, 1967), an aspect of Kaldor's 'second incarnation' (functional income distribution), and an enlightened synthesis of Minsky's Keynes and Godley's Kaldor. Godley was himself inspired to develop his New Cambridge Stock-Flow accounting schemes on the basis of Kaldor's work that led to his 'third' incarnation, but Lance Taylor's adoption of Godley's Kaldor (see, for example, Shaikh, 2007, p. 7 & fn. 2, p. 17 and *ibid*, chapter 5) was only, in fact, an adaptation of his own fundamental modelling vision, that was first outlined more than thirty years ago (see, for example, Taylor, 1979 - which was, in fact, not only the textbook I used when lecturing on development economics in the early 1980s and, again, in the second half of the 1990s, but also a 'manual' I carried with me during my own, short-lived, career as a policy advisor at one or another UN organ). Incidentally, the so-called New Cambridge models came into being in the early 1970s, during my graduate student days at Cambridge. We, as students, only dimly perceived the conflicts between 'Old Cambridge', represented most explicitly by Kahn and Posner, and the 'New Cambridge' of Godley & the Department of Applied Economics which he was directing, together with Robert Nield. However, there was no doubt, even in the minds of raw graduate students, that the intellectual spirit underpinning New Cambridge was Kaldor.

<sup>8</sup> Alas, Targetti's important, mildly provocative and wise, five questions, in the Discussion section, were left unanswered by the distinguished Lord of Newnham (see pp. 138-141 & the footnote on p. 141).

Italian 'broadsheets', in the whole political spectrum, ranging from the right to the left: *l'Unità, Il Sole 24 Ore, Il Corriere della Sera, la Repubblica, Il Giorno, L'Alto Adige* and *il Manifesto*.

He married the distinguished Polish economist, Dr Boguslawa Kinda, in 1982. They had no children.

One of my lasting pleasant memories of times shared with this gentle, gentlemanly, scholar, and his charming, erudite wife, 'Bogna', occurred in the late 1980s. At that time, I was a Professor in Denmark, but my wife and I spent as many months of any given year at our home on the majestic Lake of Como, on its 'Manzoni side'. One side of Targetti's ancestral heritage was on the 'other' side of that enchanting lake. Our mutual friend, Roman Frydman and his charming wife, Halina, spent - occasionally - some of their time in Denmark, where many of their relatives had sought refuge from the late-1960s anti-semitic Gomulka regime in Poland. Consequently, I was able to persuade them, during a period the Frydmans spent with the Targettis, to visit us at our home in Valsassina. That day, when the six of us were blessed with a classically exquisite Lombard sky<sup>9</sup>, was one of the happiest days for my wife and me.

Over the almost forty years that we knew each other, we sent each other our occasional scribbles - his more nuanced and policy oriented, but anchored, always, in solid, classical economic theory; mine more abstruse and getting 'abstruser', as Alice may have said - and commented frankly on them. I always valued his comments on my various papers, expressed with gentle frankness, chiding me for being abstruse, but doing so constructively, and suggesting ways of making them appealing to a wider audience. They were always valuable, always erudite and always pertinent - and always expressed from any one of many current streams in which the *Zeitgeist* seemed to have been flowing.

<sup>9</sup> "Quel cielo di Lombardia, così bello quand'è bello, così splendido, così in pace" – Manzoni's famous lines in his 'Betrothed'.

### **3. Wisdom of a Scholar**

“..... When I was young I made my first steps into that direction [of fitting events, i.e., factual propositions, analytical propositions or simple sentences or even ‘boutades’ in a high theory context], but for the fragility of my mind and because of the overwhelming interests for the novelty of facts I did not go much ahead along that way, even if I did not elaborate anything of some importance about the new facts which stimulate my intellectual curiosity. But at least I generally know (it is not much, but it is something) what are the main questions on the carpet.”

*Targetti to Velupillai [e-mail, 26 October, 2008]*

Over many years of interacting with Targetti I have been blessed with his wisdom on policy issues, at almost every crucial, current, historical point of crisis. He would write me, in his invariably gentle way, pointing out the critical junctures that were important in any actual path neglecting possible alternatives, in a historical context – and why the alternatives were ignored.

In one recent wonderful epistle (e-mail, 26 October, 2008), he summarised the current conundrums with immaculate clarity.

As far as the recent financial crisis is concerned I would enumerate this “decalogo” - from the most limited question to the most all-embracing.

- 1 In the future the **investment banks** will disappear: which are the risks (conflict of interests or “gemelli siamesi” [Siamese twins] following Mattioli) of having universal banks?
- 2 In the future a **super-national Bank Regulator** will be necessary facing a financial market which is global. That will be settled or the countries will pass a set of administrative rules which will limit the globalization of financial markets?
- 3 In the future world we will likely see emerging a **monetary and**

**financial model** different from the one prevailing in the last 10-15 years: less finance, less financial leverage, greater regulation, less liquidity and higher interest rates. Will America be able to cope with it?

- 4 The contagion passed from investment banks to all banks, from banks to stock exchange, from USA to the rest of the world, it will be from finance to real economics. It will affect investment and consumption, then employment and consumption and hence income and imports. It will then affect even the emerging countries less dependent from finance, but more dependent from export. It will be a **recession or a stagnation** with millions of unemployed people?
- 5 The financial crisis hits small economies (Island) or economies with banks having liabilities larger than the GNP of the country in which these banks are located. It is conceivable a spread **bankruptcy of the States**?
- 6 The differences with 1929 is mainly due to the fact that at that time the Governments and the Central Bank did not react with an **anti-cyclical policy**, but with a procyclical one (because of wrong theories and ideologies). Now it is not the case. It is enough?
- 7 To strengthen the Keynesian measures it is necessary a coordination among the big economies in terms of financial measures and in terms of a **coordinated fiscal policy**. Will be this the (proper) answer or the countries or they will prefer to follow one's own route and give the way to a new Smooth- Hawley Tariff Act à la 1930?
- 8 The coordination is a possible answer in the short run. But in the medium-long the countries will be willing and able to create a new economic order? Take the example of the macro imbalance between USA in a constant internal (private and public) and external deficit and China (Asia) with constant internal and external surplus and under-valued currency (vis à vis the dollar). Which institution or set of institutions will be entitled to tackle these problems: G7, G14, a new IMF? Furthermore the developed world is ready to abandon the ideological myth of the all-power market, and to give a bigger role to the **regulatory tasks of the State**?
- 9 **USA-EU**. At the onset of the crisis one could suppose that the USA will emerge weaker from this crisis vis a vis the Europe, but perhaps

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it will not be the case. In fact they have one Parliament, one Treasury and one Central Bank, Europe have several institutions, a Treaty which in these circumstances is a burden, an inflexible Central Bank. Furthermore in the short run Spain is affected by Argentina crisis, UK is in recession, UK, Spain and Ireland have housing market problems, Eastern Europe (Hungary, Baltic countries, Ukraine) is in a mess which draw into it the Western Countries and Banks which have invested a lot there, Italy have less financial problems than the others, but bigger problems in terms of economic structure.

10 The Western world will emerge weaker from this crisis from economic, intellectual and moral ground (even if Obama will win as everybody of us hope for). The USA (despite point 9) less and less will remain as the unique super-power. It is conceivable that the institutional reforms, necessary for a new economic order, could emerge from a **world without a single hegemonic power**: something which never happened before?

Many years ago, Richard Goodwin wrote down the *Ten Golden Rules*<sup>10</sup> of Capitalism's dynamics. He later titled this as 'Capitalism's Golden Rules' (Goodwin, 1972 [1982]). Goodwin first presented them the year Targetti arrived in Cambridge, 1972. For the benefit of younger friends of Targetti, I give it in its entirety, here (Goodwin, op. cit, chapter 13, pp. 171-2):

***"Capitalism's Golden Rules"***

*[Bulletin of the Conference of Socialist Economists, 1971]*

A set of simple, interrelated propositions, based on premises widely accepted by bourgeois economists.

- 1 To each profit rate corresponds a set of relative prices. A change in relative prices alters the technique of production chosen by competitive producers.
- 2 To any particular growth rate there corresponds an efficient technique, i.e., that collection of production processes which, after allowing for necessary accumulation, yields a greater consumption than any other technique.

<sup>10</sup> Or, were they the *Ten Commandments*?

- 3 The best technique will be chosen by competitive producers if the profit rate on invested capital equals the growth rate.
- 4 Any consumption by owners of produced capital goods means that the profit rate is greater than the growth rate. The result is the choice of an inefficient technique, in the sense that both capitalists and workers could consume more had the technique associated with equal growth and profit rates been chosen.
- 5 All capitalist economies are inefficient in this sense, since capitalists do in fact consume a part of profits.
- 6 Any profit rate greater than growth rate amounts to levying taxes on output for the benefit of a particular class. Like all such taxes they fall unequally on different goods, so that there is an alteration of relative prices which corresponds to no operative aspect of the production process. The result is an inefficient technique and a sub-optimal allocation of resources. This is separate from and additional to the unjustifiable distribution of consumption.
- 7 Therefore, optimality requires in effect expropriation of capitalists, since if the owners of capital can never, now or in the future, consume any of the income the ownership of capital is nominal, its 'fruits' accruing to the whole of society.
- 8 Just as to each profit and growth rate there corresponds a best technique, so also there is a best technique for the stationary state with zero growth rate. Only a zero profit rate will lead producers to choose that technique.
- 9 Therefore, if capitalists cease, either voluntarily or under compulsion, their accumulation, optimality requires the reduction of their revenue to zero in the absence of growth.
- 10 Capitalists have been, and still are, engines of growth, however imperfect or wasteful their performance may have been. Consequently, as the industrialised economies gradually but inevitably decelerate, the capitalist loses his function. The determination of the rate of return on capital then becomes a naked struggle over shares in the product. But also the outcome will affect adversely the size of the product to be shared in exactly the same way as monopolistic pricing or excise taxes."

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Coupling Goodwin's ten golden rules with Targetti's wise 'decalogo', would easily enable me to design an interesting course on Capitalism's macroeconomic conundrums. I doubt many could do much better – and certainly not any current macroeconomic orthodoxy, of any hue.

#### **4. Reflections on a Gentleman's Biography of an Itinerant Lord<sup>11</sup>**

"I have been asked ... to give a talk about Kaldor. Once upon a time [it] would [have been] very simple, but now I am rusty - it is more than 10 years that I do not water that garden! You are a master not only in math-economics, but also in reconstructing the ideas and atmosphere of the time when the ideas developed. If you will continue with your Trappist behaviour, your silence will be difficult to interpret: agreement or vow of silence?

*Targetti to Velupillai [e-mail, 20 March, 2009]*

I was privileged to have been weaned, for my education as an economist, on the magisterial Wicksell biography, *Knut Wicksell: Rebell I Det Nya Riket*, by Torsten Gårdlund<sup>12</sup>. From that original inspiration, I sought to understand the contribution of the pioneers of economic theory by first trying to understand their own intellectual formation<sup>13</sup>.

<sup>11</sup> I refer to Nicholas Kaldor and use the word 'itinerant' not in its sense of a 'nomad', but in the sense of an intellectual wanderer. Kaldor, to be stylistic about it, in Kaldorian vein, became internationally renowned as a follower, expositor - even a translator - of Austrian capital theory, and at the end of his life was one of the foremost exponents of one variant of Keynesian economics. There were many allegiances and adherences in between, and some of them spawned whole variants of Keynesian economics and economic dynamics, from macroeconomic distribution theory and nonlinear endogenous business cycle theory to refreshing approaches to growth and trade theories. Indeed, Targetti perceptively noted that 'Kaldor wrote about everything' (Targetti, 1992, p. viii). Yet, that Targetti was able to tell a coherent story about this ceaseless, restless, 'itinerant' academic, is a tribute to his powers of synthesis, which - in my opinion - was entirely due to his mastery of the history of economic thought and analysis.

<sup>12</sup> I was fluent enough in Swedish, by 1971, to have had the serendipitous opportunity to have read it in the original language - even while being a student in Torsten Gårdlund's last lecture classes at the University of Lund, in autumn, 1971.

<sup>13</sup> Most recently, during the Cambridge Journal of Economics sponsored Conference in Honour of Geoff Harcourt, at Cambridge in the end of June, I met Peter Groenewegen, whom I complimented on his own magnificently comprehensive biography of Marshall: *A Soaring Eagle* (Groenewegen, 1995), and added that 'it was in the great tradition broached by Gårdlund'. His response was: 'Gårdlund's was in a class by itself'!

It was, therefore, natural for me to have been interested in, and absorbed by, Targetti's scholarly and comprehensive study of Kaldor's many faceted contributions to economics<sup>14</sup>. There were (at least) three Kaldorian incarnations in one full lifetime: the early Kaldor with strong allegiance, in particular, to *Austrian Capital Theory*, handsomely and unequivocally disowned in his famous Corfu Conference debates with Samuelson, Solow and Domar (Kaldor, 1961, especially p. 294)<sup>15</sup>; then there was the *Keynesian* Kaldor of the 1950s and early 1960s, developing, at the same time as Kahn, Joan Robinson and Goodwin, growth and distributive cycle models in the Cambridge Keynesian tradition<sup>16</sup>. Finally, there was the 'third incarnation' of Kaldor, developing his own vision of intersectoral and multisectoral macroeconomic dynamics, inspired by Adam Smith and Allyn Young, on the one hand, and trying to remain faithful to the effective demand traditions of the Keynesian he always remained.

Kaldor, to a very large extent, and to a much lesser degree, Goodwin, were the intellectual lines of intersection between the contents of this fine book by Targetti and one, early, aspect of my work. In particular, the admirable, albeit not completely successful, attempt to provide a comprehensive background to (mathematical) endogenous trade cycle theory, from its origins in the early 1930s, to a transitory culmination on the eve of the Lucasian revolution and its *ad hoc stochastic shock theory*

<sup>14</sup> Kaldor was my first doctoral supervisor at Cambridge, for the Michaelmas and Lent Terms of 1973/74. Given the 'Swedish Connection' in Kaldor's early intellectual and professional life documented by Targetti (1992, p. 5 & p.11), it may be amusing to narrate the following story of my first encounter with Kaldor, in May, 1973. I was to be interviewed by Kaldor (who was the Chairman of the Faculty that year), before consideration for admission to the doctoral program at Cambridge. I presented myself in Kaldor's small office in the Faculty, quite nervous, and was asked, immediately, by Kaldor: 'Why do you want to come here when you have Lindahl and Myrdal in Sweden'? It was, of course, out of the question for me to reply by saying: 'Lindahl had died in early 1960'! Incidentally, Myrdal, who had been the Trade Minister in the Social democratic government till 1947, had to resign under controversial circumstance, before taking up his Directorship at the Economic Commission for Europe, to which he hired Kaldor to be the Head of its Planning and Research Division (Targetti, op. cit, p. 11).

<sup>15</sup> Björn Thalberg, my gentle and generous first serious teacher of macroeconomics, who was present at the Corfu Conference, told me, in personal conversations, that Kaldor sat opposite the formidable trio of Samuelson, Solow and Domar and, with characteristic confidence, asserted: 'I have Marx and von Neumann on my side'!

<sup>16</sup> In my opinion, the classic Kaldorian endogenous, nonlinear, trade cycle model was the one time Kaldor tried to fuse Keynesian elements with Kaleckian insights, and it was not a subject to which he returned in any systematic way in his mature Keynesian years of the 1950s.

*Ferdinando Targetti - in memoriam scholar, friend, colleague and a gentleman*

of the cycle, to place in a proper context Kaldor's classic Keynesian nonlinear model of the trade cycle (Kaldor, 1940), in Chapter 3 of the Kaldor Biography, attracted my serious attention.

Two other aspect of Targetti's fine summary of Kaldor's contributions was of considerable and lasting interest for my own work, over the years: growth theory and Kaldor's later methodological invectives against what Clower has felicitously referred to as the *Neo- Walrasian Code* (see Velupillai, 2011).

With hindsight at our disposal, it may not be too unfair to note that both Kaldor's nonlinear, Keynesian, model of the trade cycle and his various lofty invectives against the *Neo Walrasian code*, may not survive the merciless tests of time. This is, I think the orthodox view that I am stating, not my own, personal, view of the desirability of their persistence and eventual success, in some form, in a possible future.

Be that as it may, chapter 3 in Targetti's book is truly comprehensive in its attempt at portraying the background and setting in which to place Kaldor's classic Keynesian, nonlinear, model of the trade cycle. If I had to assign one 'survey' type article to a graduate class on Mathematical Theories of the Trade Cycle: From Tinbergen (1931) and Frisch (1933) to Lucas (1987) and Kydland & Prescott (1982), one that would provide the base from which to teach the nonlinear, endogenous, theory of the trade cycle, I would still choose this wonderful chapter by Targetti.

But I would need to add many and various caveats to its inclusion and to the way it should be read and used by graduate students. The chapter is marred by serious mathematical, bibliographical, conceptual and doctrine historical infelicities. But these are easy to rectify; the important point is that it provides a beautiful - even if flawed - touchstone for the serious teacher, to interested and mathematically competent students, of the place that was nobly occupied by nonlinear, endogenous, theories of aggregate fluctuations.

*Growth at Different Rates and Kaldor's Laws*, chapter 7 in the book, serendipitously, has provided my graduate course on *Macroeconomic Development Economics*, at the **School of International Economics**, the perfect framework to give the students an alternative vision (see Chapter 15 in Targetti, op. cit) of the possible world of policy in a developing context. I am particularly proud and happy that I agreed to

give this course, since I was sure that the way I structured the contents and scope of the course were meant to harmonise with the spirit of Kaldor and the wisdom and vision of Targetti - alas, now also the phantom of the latter, too.

Finally, there remains, at least for me, the puzzle of Kaldor's negligence of Schumpeter, indeed even hostility to his fellow 'Austro-Hungarian'. There are only a handful of innocuous references to Schumpeter in Targetti's magisterial biography. One of them (fn. 50, p. 131) gives the impression that Kaldor may have endorsed a role for the Schumpeterian innovating entrepreneur. But that quote continues in a less than felicitous way (Kaldor, 1954, p. 53; see below).

I have always wondered whether the less than intimate relationship between the gentle, laidback, Goodwin and the restless, even effervescent, Kaldor may have its source - or one of its sources - in this 'Schumpeterian dissonance'. Just as Kaldor, in his third incarnation, as his own master, fused Adam Smith and Allyn Young with Keynes, there was Goodwin nobly trying the almost impossible with Marx, Schumpeter and Keynes. In the end, the common element remained Keynes, perhaps in two different Harrodian inspirations, diametrically opposed to each other: for Kaldor it was Harrod's foreign-trade multiplier (Harrod, 1933), but not his fundamental resource constraint of labour leading to an intrinsic, always active, nonlinearity; for Goodwin, it was the multisectoral Keynes-Leontief multiplier, together with the intrinsic Harrodian nonlinearity<sup>17</sup>.

Ferdinando Targetti was too well-mannered a biographer to emphasise these dissonances between the giants who were also his friends and mentors.

## 5. The Noble Colleague

"Thank you very much for the pictures [of Dick Goodwin with the Cambridge Phillips Machine] and the letter of Dick. Reading those letters I see his smile and I felt his presence close to me. They remind me [of] his lectures in the '70s and the feeling I got: I liked a lot his

<sup>17</sup> It is my thesis that it was only in the work of the mature Lance Taylor that all these elements came together, but even he may not have incorporated those Schumpeterian elements that came to dominate Goodwin's work in his last years.

diagrammatic representation of Sraffa-Leontief and all that (I tried to use the same diagrams to represent the Theorem of Non substitution without reaching anything acceptable); I also liked his Kolmogorov-Volterra<sup>18</sup> graphic representation of Marx's cycle that I taught to classes often not fascinated as we were, [when] listening to [Dick]. Later in the '90s [Dick] came back to his '50's studies and when I tried to read his articles about "special attractors" or about the application to economic cycles of the theory of chaos - well a certain chaos is exactly what happened in my mind. However I was fascinated by the message, strong and convincing, of the representation of the market (capitalist?) system as a completely deterministic system but having endogenous irregularity and unpredictability of the outcome. What a differences in comparison with the representation of the market as an optimum intertemporal allocation system! The actual crisis seems a vindication of that approach."

#### Targetti to Velupillai [e-mail, 3 February, 2009]

<sup>18</sup> This was a characteristically wise and illuminating seemingly erroneous – at least in the eyes of the hair-splitters – reference to Goodwin's use of the classic Lotka-Volterra system of equations to model the 'contradiction of capitalism's aggregate dynamics'. But it is a tribute to Targetti's memory that he remembers it as the 'Kolmogorov-Volterra graphic representation'. There is a very personal story to the way Goodwin became aware of Kolmogorov (1936). From the very first months of my arrival as a graduate student at Cambridge, and even though I was formally Kaldor's pupil, I began seeing and working with Goodwin. One of the first suggestions he made to me was: 'Read and master Minorsky (1962) and Andronov-Chaikin (1949)' – and he lent me both books (the later, expanded, edition of Andronov, Chaikin and Vitt (1966) was a thing of the future, for me, never for Goodwin). In a footnote on p. 69 of Minorsky's book there is a reference to Kolmogorov's 1936 classic – but it was in an Italian journal and in Italian. During the winter break of 1973, I wrote my friend, Guglielmo Chiodi, requesting him to get me a copy of the paper (those were, of course, years before JSTOR, Science Direct and so on). Chiodi not only obtained a copy of the paper – he also translated it into English and sent it to me. During the Easter term one of our fellow graduate students, on the verge of completing his doctoral dissertation, gave a seminar, outlining the main results in the thesis. I was astonished to listen to the presentation – because it was a simple application of the framework in Kolmogorov! I wrote a note to Goodwin, with a copy of Kolmogorov's original, together with Chiodi's translation and pointed out that the core model in the thesis of our fellow graduate student was nothing more than one aspect of Kolmogorov's result. The further ramification of this particular aspect is another story – but from that time onwards, i.e., Spring 1974, Goodwin always used what Targetti correctly remembers as the 'Kolmogorov-Volterra graphic technique'. There were three – obviously hand-drawn – diagrams of dynamics in the phase-plane, in a paper of really only a little more than effectively four pages of text in that classic by Kolmogorov, made easily accessible for a new generation of young aficionados of dynamical systems theory by its 'popularisation' in chapter 12 of the first edition of Hirsch-Smale (1974), which was also introduced to me by Goodwin. But this time I was able to run a race with the champion, as we both read it almost simultaneously; there was no question as to who mastered it first, and quite comprehensively!

Our lives - his and mine – were plagued by debilitating illnesses during the past decade and a half - indeed literally from my arrival at Trento, in the last years of the last century. Thus, for almost the first eight or nine years of my official tenure here, at Trento, I was almost only present as a ghost, with very little stamina or drive to work intensively. Equally, Ferdinando was increasingly plagued by the illness that, cruelly and mercilessly, first debilitated him and then took him away from us, prematurely.

The many ways we could have collaborated on expanding Kaldorian visions never materialised. In particular, my own conviction, honed by years of instruction at Goodwin's enlightened feet, that Kaldor (1940) was, actually, a proverbial 'flash-in-the-pan', although it did inspire a great deal of later work on nonlinear, endogenous, macrodynamics, particularly at the hands of the remarkable Japanese trio of Yasui<sup>19</sup>, Ichimura and Morishima (see Velupillai, 2008). I did not think Kaldor ever managed to synthesise growth and cycles, in the way Goodwin did, but that may have been the influence of Schumpeter, as well as Keynes, on the latter.

Targetti was a master expositor of Kaldor's various transmogrifications as he moved from one model of growth theory to another, finally ending up with the kind of applied growth theory, underpinned by Allyn Young's visions and tempered by 'Verdoorn's Law'<sup>20</sup>. Very few, apart from Ferdinando Targetti, Tony Thirlwall and Lance Taylor managed to provide coherent stories for those of us who wanted to base our *development* visions, from a policy perspective, on Kaldorian multisector models, where supply and demand played crucial roles in that sense made famous by Allyn Young and Gunnar Myrdal: cumulative and circular causation - and, thereby taking us back, too to those famous sections in the first three chapters of *Book I* of **The Wealth of Nations**.

<sup>19</sup> During a characteristically enchanting lunch in the Tuscan countryside, in 1983, Kaldor, in conversing with me, his former pupil, still remembered, vividly and fondly, Yasui's work, to which he had referred in footnote 3, p. 9 of the Introduction to Kaldor (1960). Incidentally, during that conversation he 'castigated' me for leaving Cambridge (while Joan Robinson had told my good friend, Professor Roger Sandilands, in Strathclyde, where her daughter was living, that she was expecting me to return to Cambridge, shortly!). Almost a quarter of a century elapsed before my return to Cambridge, but it was almost still-born!

<sup>20</sup> Verdoorn became a part of the powerful team Kaldor assembled to work with him at ECE in Geneva, in the late 1940s; the others being Tibor Barna and Robert Nield (see Targetti, op. cit, p. 11).

Kaldorian macrodynamic models did manage to be underpinned by Smith and Ricardo, but Marxian dynamics did not enter that world, in the way it did in Goodwin's more powerful nonlinear endogenous macrodynamic models, always trying to find a meaningful synthesis of the cycle and the trend, of growth and cycles, not, thereby, neglecting functional distribution.

It was in this synthesis between Kaldorian visions of growth and development and Goodwin's nonlinear dynamics of growth cycles that I thought Targetti and I could have collaborated. His mastery of Kaldor, supplemented by my sympathies for Kaldor's visions; my 'mastery' of Goodwin, coupled to his deep interest and attachment to Goodwin's Marx-Schumpeter<sup>21</sup> world of capitalism's contradictory dynamic contours, may have been the source of a happy collaborative effort.

*It was not to be – at least not in the past; perhaps I will be inspired to work with Targetti's inspirational spirit along that path that we sometimes spoke about – for over a quarter of a century.*

Yet, we kept in touch, and on those rare occasions when our presence in Trento coincided, we had long and interesting conversations – mostly Ferdinando updating me on the events of the world, against the backdrop of history. In one wonderful conversation, over dinner, not too many years ago, he explained to me French politics, policy and visions in terms of a reincarnation of *Jean-Baptiste Colbert's resurrection as Nikolas Sarkozy's official 'muse'*.

<sup>21</sup> Although Goodwin never expressed open disagreement with Kaldor's visions, on growth or cycle theory, in personal conversations he was less than happy – to put it mildly - with Kaldor's neglect of Schumpeter's maxim: 'the cycle is a manifestation of growth'. Kaldor (1954) is replete with unwarranted criticisms of the Goodwin approach to growth cycles, underpinned by Schumpeter's theory of innovations, and even more, scathing, attacks on Schumpeter's theory itself (ibid, p. 53):

“[I]t is not possible to make the [Schumpeter] story as a whole into a 'model' (meaning by a model the sum total of assumptions which are just sufficient - no more no less - together to provide the necessary and sufficient conditions for the generation of a recurrent cycle with a clear periodicity) without incorporating into it elements which would suffice by themselves to explain the cycle - without recourse to Schumpeter's own stage army of initiators and imitators, or even the very concept of technical progress.”

Two comments are in order: one, how does Kaldor know that 'it is not possible to make the [Schumpeter] story as a whole into a model'? Is this an 'impossibility theorem', within some mathematical formalism of theories and models? Secondly, it is precisely the construction of a 'model' to encapsulate the 'Schumpeter story' that was attempted and achieved in Goodwin (1946) - but, of course, not 'with a clear periodicity, which was not a criterion in the 'Schumpeter story'.

It was vintage Targetti, full of humour, tinged with scholarship in the narrative that placed current dilemmas in the way they were approached and resolved in a society's past, from which it could not - often, would not - run away. Indeed, the way he would structure his narrative, it was as if any society's political traditions cast a spell on the visions it was able to devise, at any one point in time.

This was a healthy and wise antidote to the biologically determined, evolutionary mania that is driving the social and humanistic sciences to embrace, mindlessly (sic!), *neuromania* as the panacea for all and every policy dilemma facing the politician and the poor rational fool, that underpins economic theory.

I am sure the noble spirit of Targetti would have abhorred these new developments that are driving economics, politics and political economy away from their noble humanistic and moral traditions – those that his teachers at Cambridge, who were also mine, tried to impart to us, as their students, and we, in turn, are obliged to pass on to our students.

This he did with unswerving commitment, as a colleague, as a scholar, as a friend and, above all, in a Gentlemanly way.

I can do no better than end with some of Tennyson's lines from *In Memoriam A.H.H.*:

*I falter where I firmly trod,  
And falling with my weight of cares  
Upon the great world's altar-stairs  
That slope thro' darkness up to God.*

## 6. Addendum

In my reconstruction of the origins of macroeconomics the key pioneers are Lindahl, Kalecki and Keynes<sup>22</sup>, in that chronological order. Thus, one of the great perplexities of Keynesian and Post-Keynesian economics - at least for me, personally - is why it took almost half-a-century for Kalecki's review of the *General Theory* to be translated into

<sup>22</sup> I do not consider Hayek as one of the pioneers of Macroeconomics. Frisch comes close to making the triumvirate a quartet, but in my opinion he owed too much to the Swedes – particularly Lindahl – that I do not feel able to include him in the list of pioneers (see Velupillai, 2009).

English (Targetti & Kinda-Haas, 1982) and for Lindahl's view of the *Keynesian System* to have been completely ignored (Lindahl, 1953)<sup>23</sup>. My intention here is not to try to unravel this perplexity. My aim is simply to make a few classificatory and explanatory notes so that a future generation of Keynesian, Kaleckian and Stockholm School scholars may not forget or ignore these classics.

Unfortunately, in the reprinting of Kalecki's review of the GT, in Kalecki (1990, Part 5, first chapter), the editor, Jerzy Osiatynski, omits the comprehensive, rich, *Introduction* (§I) and the *Bibliographical Note and a Comment* (§III) by Targetti and Kinda-Haas (for the rest of this addendum referred to as T&K-H). Instead the editor chose simply to 'summarise' them (*ibid*, pp. 509-510), thereby doing a disservice to both Keynes and Kalecki scholars.

A. Three points of 'Swedish' clarifications may make the Introduction more complete and correct:

- I. In the opening paragraph, p. 244, T & K-H, state: 'Lindal (sic!), Ohlin and Lundberg were also working on similar lines [to Myrdal, 1931]. The key figure, building the bridge between Lindahl and Myrdal, on the one hand, and Lundberg, as the 'culmination' of the 'disequilibrium period analysis' of the Neo Wicksellians, was Hammarskjöld (1933). Ohlin was, in this respect, quite marginal<sup>24</sup>.
- II. In the same paragraph T & K-H state: "Frisch, however, had applied his model [Frisch, 1933] only to shipbuilding cycles while Kalecki's model was related to the whole economy." There was - and there remained - a long and distinguished tradition of modelling shipbuilding cycles by Norwegian economist, partly in the technical (not political economic) Marxian tradition of

<sup>23</sup> It remains a mystery, too, that Keynes himself never reviewed, in any meaningful way, any of *Lindahl's classics*, nor reflected, in any published way, Kalecki's classic contributions to business cycle theory. Ohlin was not quite the 'insider' to the development of the Macroeconomics of Stockholm School, nor did many of the 'young Turks' feel Ohlin's representation of their work in monetary and business cycle theory in his debates with Keynes was faithful to the Neo-Wicksellian work they were doing, as is usually made out in the Anglo-Saxon literature (see Velupillai, 1988).

<sup>24</sup> In an uncharacteristically pungent letter to Hammarskjöld, dated 13<sup>th</sup> March, 1932, Lindahl wrote: 'Even Ohlin is *now* trying to learn monetary theory ...' (my translation from the original Swedish; letter deposited in the Lindahl Archives at his family home, where I worked in the early 1980s). See also Velupillai (1988, footnote 6).

reinvestment cycles, especially under Frisch's direction at Oslo (see, for example, Einarsen, 1938). But the classic **Cassel Festschrift** article by Frisch was explicitly Macrodynamical in the same sense in which Kalecki's classic of 1935 was. It is possible T & K-H were thinking of Tinbergen's classic on *Ein Schiffbauzyklus* (Tinbergen, 1931), the fountainhead of mathematical business cycle theories, in this writer's opinion.

- III. I conjecture that T & K-H would welcome the comprehensive demonstration by Zambelli (2007) of the infelicities in Frisch (1933), which places his critique, at the Leyden meeting of the Econometric Society, in September-October, 1933, of Kalecki's structurally unstable model, in proper analytical perspective! In a sense, both were guilty of the same kind of analytical 'sin', as incontrovertibly demonstrated by Zambelli (op. cit).
- IV. Finally, with respect to the second full paragraph on p. 244, it may be of some help to the uninitiated reader, if there be such left in the profession, to refer him or her to Lundberg (1996, particularly, pp. 99-100 & 119-120) for a full report of the interchange between Targetti and Lundberg on Kalecki<sup>25</sup> and his sojourn in Stockholm, in 1936.

Explanatory notes on Lindahl's two part reflection *On Keynes' Economic System* (Lindahl, 1953):

- I. Some interesting points, relating to the way Lindahl came to a serious reading of the *GT* is described with sensitivity and finesse by Bent Hansen in his letter to me, of January 2, 1985, which is included here, as Appendix I. This letter should, ideally, be read together with the brief section on Keynes (§8, Ch. VII) in Myrdal's **Hur Styr Landet** (Myrdal, 1982).

<sup>25</sup> Indeed, in his thesis of 1937 (Lundberg, 1937), Kalecki is referred to as Kalecky! Incidentally, Richard Goodwin, for his lectures on economic dynamics at Cambridge – those that Targetti and I regularly attended – would begin by writing up, on an old-fashioned blackboard, with old-fashioned white chalk, just three 'recommended' texts: **Schumpeter, Kalecki and Lundberg!** In December, 1973, with a recommendation from Goodwin, I made an appointment to see Lundberg at his office in Stockholm, at the Stockholm School of Economics. The appointment date, chosen by Lundberg, was the afternoon of 23 December; I turned up at the exact hour – but he was not there! I waited for a while, and then left, heading for the subway trains to take me back 'home'. There, at the station, on the other side of the platform, I saw the impassive figure of Erik Lundberg, waiting for the train going in the opposite direction!

II. In this much neglected minor classic by Lindahl - a master expositor of complex ideas in deceptively elegant prose, much in the mode of John Hicks – he uses a series of ingenious and unusual diagrams to make his arguments persuasive (knowing, as always, the limitations of two-dimensional graphical expositions). In footnote 1 on the second page of the article he refers to his indebtedness to an article by Ira Scott (1950-51). To the best of my knowledge, the genesis of the diagrammatic technique used by Lindahl, ostensibly deriving from Ira Scott, has never been explained. Since the story of its origins are both very personal and somewhat painful for the true inventor of the particular diagrammatic technique, and since the inventor was a close friend and teacher of both Targetti and myself, I thought I might tell the story of its genesis to settle priorities once and for all!

In May, 1985, Geoff Harcourt sent me a reprint of his wonderful portrait of Richard Goodwin, referring to him, in the title, as *A Twentieth-Century Eclectic* (Harcourt, 1985). On pp. 415-6, he states:

“At Harvard, Goodwin took part in the debate about Keynes. He was assistant to John Williams and taught Keynesian economics as part of a money and banking course. (Goodwin used a four quadrant, rather than the Hicks-Hansen two quadrant, diagram which he never published, though one of his students – he forgets who – did.)”

I wrote almost immediately to Harcourt, on the 3rd of June, 1985, as follows:

“I think I can enlighten you on who the student was! I am working on a monograph on the Contributions of Erik Lindahl (with full blessings and cooperation from Mrs Lindahl ....). One of his fundamental Keynesian papers was, in fact, published in the *Economic Record*. In that Lindahl used the ‘four quadrant’ technique and referred to a paper by Ira O. Scott in the RES, Vol. XIX. ... Footnote 3 on p. 13 of Scott’s paper provides a solution to the above query:

“After preparing the first draft of this paper, the author benefitted greatly from reading an unpublished manuscript in which Professor Goodwin presents a slightly different version of the Keynesian system in diagrammatic form.”

A few months ago I showed this to Goodwin who, then, remembered that it was, in fact, Ira Scott. This, was, obviously, after your interview so that he couldn't enlighten you at that time. In any case my own discovery was an entertaining process. Lindahl's path to the writing of the article I have cited above is even more interesting. I have had long correspondences with Bent Hansen and Don Patinkin about it<sup>26</sup>."

I sent off a copy of my letter to Harcourt, almost immediately, together with one of my regular (and frequent) letters to Goodwin. He responded, immediately<sup>27</sup> (Goodwin, 1985):

"I was interested by your letter to Geoff. In talking to him I had forgotten you had uncovered the name of my pupil Scott. He was intellectually dishonest in an effort to promote his own originality. He attended my lectures and published that diagram, which I believe was essentially the same as my own, afterward! I developed it as a teaching-aid and only gradually, or subsequently, realised that it was simply an elaboration of Hicks' IS\*LM. Possibly for that reason I never published it, but more likely because it was simply good for teaching the G.T. ----- and therefore of limited interest. I used it an elaborated cob-web, giving a cycle which was asymptotic to equilibrium. It only became really interesting if one added, as did Harrod, Kalecki, and later Kaldor, the accumulation process.

And that was what I was interested in --- trying to formulate a model which would show that Harrod was right and Tinbergen wrong in that rather brutal review he [Tinbergen, 1937] wrote of Harrod's book<sup>28</sup>. That is what I should have said and not what Geoff reports me (quite possibly correctly) as saying - as you point out."

<sup>26</sup> The letter from Bent Hansen, appended below, is part of this correspondence; I am not including the Patinkin part of the correspondence for aesthetic and ethical reasons.

<sup>27</sup> Those were the days, in those pre-email halcyon age, when the mailman's 'horse & cart' reigned supreme, the old Remington's ruled and the fountain pen and bond paper were treasured possessions, whereby the brain in the hand was exercised at leisure.

<sup>28</sup> The 'rather brutal' sentence, in Tinbergen's review, to which Goodwin refers is (ibid, p. 90; italics added): "Die Kombination also der 'relation' mit dem Satz über den 'multiplier' in der oben beschriebenen Weise gibt essentiell *keine Theorie des Zyklus*, und zwar ohne Rücksicht auf die gestalt der Funktion  $\varphi(x)$ ."

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Ferdinando Targetti - in memoriam scholar, friend, colleague and a gentleman

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**INDUSTRIAL PATTERNS IN CHINESE CITIES, AN ANALYSIS  
USING SOM NEURAL NETWORKS**

**Abstract**

*Our purpose in this paper is twofold. First we intend to verify whether the industrial patterns characterising the selected Chinese cities present heterogeneous or homogeneous structures.*

*Secondly, we aim at understanding whether there exists a way to codify effectively such industrial patterns in terms of an interindustry relationship. We also try to provide some insights on the dynamics of the process of industrial convergence observed in China. The paper is structured as follows. After a brief survey of the literature (section 2) and a description of SOM neural networks (section 3), we investigate industrial patterns in Chinese cities (sections 4 and 5). Finally, we discuss the dynamics of convergence in China and draw some conclusive remarks (section 6).*

**JEL CLASSIFICATION:** C18; C45; R11; R12.

**KEYWORDS:** CHINA, INDUSTRIAL PATTERNS, CITIES, SOM NEURAL NETWORKS.

**1. Introduction**

Our purpose in this paper is twofold: first we intend to verify

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whether the industrial patterns characterising the selected Chinese cities present heterogeneous or homogeneous structures; secondly, we aim at understanding whether there exists a way to codify effectively such industrial patterns in terms of an inter-industry relationship. For industrial pattern we mean the particular distribution of employees in the N economic sectors.

We also try to provide some insights on the dynamics of the process of industrial convergence observed in China.

To this end we focus on the strongest regularities, in terms of industrial patterns, emerging from the computation of a complex indicator called Relative Industrial Relevance (RIR). The overwhelming presence of a specific economic sector can be identified through the computation of a simple concentration index, while RIR is a complex indicator obtained from computation of Kohonen's layering of self-organising maps (SOM)<sup>1</sup>. In other words, our methodology allows us to understand whether an industry is important in relative (rather than in absolute) terms and how it contributes to the formation of observed industrial patterns for understanding the development and adaptive transformation of the economic landscape (see Batty 2005, Martin and Sunley 2006, 2007).

Our results represent an attempt to support empirically recent studies on the supposed process of convergence (started in 1979) of the industrial patterns of Chinese provinces and cities, and also provide an effort to select some elements of the dynamics of convergence which seem to better describe this process.

The value added of our analysis with respect of previous approaches is that we do not reason in terms of a single notion of what a pattern can be (Bottazzi et al 2007), as endogenously defined. Rather, we explore how many different and meaningful alternative instances of patterns we can find out in the data and, then, after that we have characterized and compared them, we emphasise that there are many possible forms of functionally integrated and cohesive spatial patterns of productive activities.

By extending the range of exogeneity not only to the determination

<sup>1</sup> SOM are a computational method for the visualization and analysis of high-dimensional data, especially experimentally acquired information (Kohonen 1982, 1995).

of the industrial pattern but even to the range of possible types, we acknowledge that each industrial pattern should be seen as the outcomes of a complex, non-linear spatial process of dynamic adaptation of interdependent productive activities.

In doing so SOM are a suitable tool for at least two reasons. First, SOM allow to map every kind of relationship among variables, in as much they make use of non-linear functions. Secondly, SOM provide a topologic clustering, because they are turned to preserve the actual structure in the original space (even though at the end of the process they provide a more compressed representation that allows to detect existing regularities and similarities).

This implies that inter-industry relationships are properly maintained during the process of data elaboration: it follows that close industrial patterns in the feature map form a cluster of cities with similar topologic relationship between economic sectors in the original space. Finally, by means of features mapping, it is possible to determine the relationship between our variables on a general level (taking the Kohonen layer as a benchmark) and within each group of similar industrial structures (within each codebook).

After providing a brief survey of the literature (section 2) and some references on SOM neural networks (section 3), we investigate industrial patterns in Chinese cities (sections 4 and 5). Finally, some conclusive remarks are drawn (section 6).

## **2. Industrial patterns in Chinese cities: an overview of the literature**

In an interesting article entitled *"The razor's edge: distortions and incremental reform in the People's Republic of China"*, Alwyn Young argues that China's markets became less integrated over time, at least until the early 1990s (Young 2000). Following the same thesis, through different methods and data, Poncet maintains that the trend toward less integrated markets protracted even beyond, until the late 1990s (see Batisse and Poncet, 2003 and Poncet 2003). In this connection, Zhang and Tan (2004) obtain results consistent with Young's findings on the evolution of primary, secondary, and tertiary sectors.

One of the main empirical findings brought by Young (2000) was

that the structure of economic output across provinces converged during the reform period, as the different provinces duplicated each other's industries. To provide evidence of this, the author makes use of two different time series from 1952 to 1997 consisting, on one hand, of output data divided into five sectors (agriculture, industry, construction, transport and commerce) and, on the other, of GDP levels related to primary, secondary and tertiary sectors.

With regards to the secondary sector, for example, Young finds out an enormous compression in the variation in the share of mining, manufacturing, construction and utilities between 1978 and 1997. Provinces with high initial secondary shares witnessed a dramatic decline in the share of that sector, while provinces with low initial shares generally experienced a rise in its contribution to GDP. Excluding Hainan and Tibet (two outliers), the range of variation in the share of secondary industry went from between 34% and 77% in 1978 to between 37% and 54% in 1997 (Young 2000: 1110).

Park and Du (2003) take a critical view of Young's empirical findings that the structure of economic output across provinces converged: they calculate an adjusted regional specialization index and show that trends in specialization over time differ rather sharply. This suggests that while regional specialization decreased during the socialist period, it increased substantially during the reform period, beginning in the early 1980s (Park and Du 2003: 4).

Our purpose is to provide a computational exercise to corroborate Young's findings that the production structure of different Chinese provinces looked increasingly similar over time. We do not intend to investigate the possible causes behind this factual result. We aim at investigating Chinese industrial patterns, trying to identify the state of the art in industrial interplay that led, through complex and dynamic processes, to the current economic system in China.

A number of interesting contributions have dealt with the causes of the convergence or divergence of output structures within and outside Chinese provinces. According to Kim (1995), a process of output divergence might depend first and foremost on changes in technology that affect scale economies. For Imbs and Wacziarg (2003), the stages of diversification are associated with different levels of economic

development (as countries develop, they first diversify, or spread economic activity more equally across sectors, and then specialize again). Hence, poor Chinese provinces might have been in the diversification state, which is likely to reduce measures of regional specialization.

According to Young (2000), again, similarities in the industrial structure of Chinese provinces followed the economic reform that began in 1978 and would be consistent with two hypotheses: increased interregional trade barriers, and the opening of China's economy internationally (in terms of the former, it is possible that interregional patterns of comparative advantage converged during the reform period and that this alone explains the convergence in output composition in terms of the opening of China's economy, its provinces would have had different specializations previously, but international openness has resulted in comparative advantages based on common industrial patterns, as exemplified in our analysis). Interregional trade barriers or local protectionism is a recurrent explanation (see Poncet 2003 and, contra, Li et al. (2005) who find decreasing local protectionism in product markets). Interestingly, Bai et al. (2004), based on output patterns, conclude that "history plays the most important role in determining the degree of regional specialization, followed immediately by protectionism".

Before discussing the several reasons behind the process of convergence or divergence of Chinese provinces output structure, it is indispensable to concentrate on measuring the industrial structures existing in China to find out a statistical approach which allows to develop an analysis based on multi-dimensional similarities rather than on an overwhelming presence of a particular industry.

### **3. Conditions of investment and remuneration of capital granted: Extra Profit**

The industrial patterns emerge from the computation of the SOM as a multidimensional map of the features analyzed. The process is completely unsupervised and based only on the features observed: the number of employees in each industry of the 288 cities and their surrounding districts.

In SOM networks the characterising element is a layer, called Kohonen layer, made up of spatially ordered Processing Elements (PEs). In theory we could consider Kohonen layers of one, two, three and even more dimensions. Typically a Kohonen layer is bi-dimensional and, if not differently specified, we'll speak about it as it's what has been used for this work. Such a PE layer evolves during the learning, specialising each PE positions as indicators of important statistic features of input data. This spatial organising process for important statistic features of input data is also known as Feature Mapping. SOM finds the feature mapping by an unsupervised learning technique.

Mapping made up by SOM has interesting characteristics, in fact through a non linear mapping, it preserves topological relationships of input data and codes them into the Kohonen map.

The feature maps of the SOM consist of two layers:

1. an input layer, with a processing element ( $PE_i$ ) for each of the  $N$  input components  $X=(x_1, x_2, \dots, x_N)$ ;
2. a layer (typically bi-dimensional, here the "Kohonen layer") made of a certain number  $M$  of  $PE_s$  organised in a grid, with  $M=MC \cdot MR$  and where  $MC$  is the number of the columns and  $MR$  is the number of the rows.

The input layer is connected to the Kohonen layer: it is important to stress that each  $PE_s$  in the Kohonen layer is affected (and, hence, its value is altered) by all the  $PE_i$  in the input layer.

A specific vector  $W_r=(w_1, w_2, \dots, w_N)$ , whose elements are given by the weights relative to the connections with the input  $PE_i$ , is associated with the generic  $PE_s$  in the Kohonen layer.

The output is computed through the Kohonen layer and is given by the position of the PEs in the grid, which takes discrete values. Note that the Kohonen layer is not a simple output layer, but is the "core" layer in the network used by the algorithm; during the learning process input vectors are introduced randomly until an equilibrium state.

This is referred to as "vectorial quantisation", and identifies the winning  $PE_s$ . Closeness of vectors can be estimated in several ways: we chose those  $PE_s$  that minimise the Euclidean distance ( $D_s$ ) between  $W_r$  and  $X$ :

$$[1] \quad PE_s: D_s = \min_{r \in \{1..M\}} \left\{ D_r = \|X - W_r\| = \sqrt{\sum_{i=1}^N (x_i - w_{ri})^2} \right\}$$

When the winning  $PE_s$  has been determined, its weights and those of its neighbors are automatically updated. Updating the weights of the entire  $PE_s$  neighborhood is essential to preserve the topological features of the input data throughout the mapping process.

The underlying definition of neighborhood is based on the Euclidean distance ( $d$ ) between the generic  $PE_s$  and the winning  $PE_s$  in the Kohonen layer. Basically we define a function  $h(d)$  which describes how the generic  $PE_s$  will update under the updating  $W(d)$  of the associated array of weights  $W_r$ :

$$[2] \quad \Delta W(d) = h(d) \times (X - W_r)$$

Usually the function  $h$

( $d$ ) assumes positive values, has a maximum for  $d=0$  and is strictly decreasing. This means that each time values are updated, the array of the  $PE_s$  weights moves towards the input data with decreasing intensity with increasing distance from the winning  $PE_s$ . Then, the Kohonen layer is a matrix of  $PE_s$  which compete and associated vectors tend iteratively to assimilate to the different input patterns. An example of the function  $h(d)$ , which exemplifies all these general characteristics, is the Gaussian:

$$[3] \quad h(d) = H e^{-\frac{d^2}{2\sigma^2}}$$

This function is defined on the entire Kohonen layer: as  $H$  and  $\sigma$  change, the effects on the  $PE_s$  and some of the learning features change. The parameters used usually change iteratively to optimise learning.

#### 4. The Leverage effect

The following analysis is turned to highlight the intersectoral dynamics (feature mapping SOM) which account for the convergence

of industrial patterns in China. In this respect, first we need to assess whether industrial patterns exist and, next, to determine the dispersion of industries which constitute identified patterns and, finally, to compute a common matrix of co-occurring sectors, with the aim of understanding how observed industrial patterns might vary their structures when changes in the value of one variable (feature) in SOM codebook occur. Such an indicator, called RIR (Relative Industrial Relevance), shows, by means of the properties of Kohonen layer, how the relevance of industrial sectors changes when only one sector modifies its features and it thus finally lead to patterns configuration.

Each features of the Kohonen Layer corresponds to a RIR and it is computed during the evolution of the SOM network, providing two results: first, each RIR is obtained as a nonlinear function of all the others, and secondly each RIR is the result of the convergence process of the industrial pattern in terms of likelihood. So when the value of a RIR varies, for example to higher values, the other RIR change their value, describing patterns of industrial groups alike.

The data used for the analysis are the number of employees in 288 Chinese Cities and the relative districts in 14 economic sectors<sup>2</sup>. Sectors include: Farming, Forestry, Animal Husbandry, Fishery; Mining and Quarrying; Manufacturing; Electric Power, Gas and Water Production and Supply; Construction; Transportation, Storage, Post and Telecommunications; Wholesale & Retail Trade; Banking and Insurance; Real Estate; Social Services; Public Management and Social Organization; Scientific Research, Technical Service and Geologic Prospecting; Management of Water Conservancy, Environment and Public Facilities; Health, Social Security and Social Welfare.

We consider cities as the minimal suitable units of analysis and take a substantial step towards an endogenous definition of patterns.

To apply our analytical framework and identify industrial patterns, we need to represent each unit of investigation (city) in a form that, although well known in the data-mining literature, is less common in the economic statistics one. The actual data encoding choices that we have made to construct the matrix – which organizes information about employment levels in 14 industries in 288 cities – have been driven

<sup>2</sup> China Data Online (2010), at [chinadataonline.org](http://chinadataonline.org).

by several different concerns. This point should not to be regarded as purely instrumental: we have reason to maintain that it also presents a tactical dimension.

In particular, we need to pre-process our data matrix by “standardizing” it, that is to say, to rewrite it by means of a generic scaling for each column-variable. We actually carried out a re-scaling by rows (instead of columns) of the data matrix, using a logistic function: Our goal is to preserve some key properties of the local distribution of employees across the 14 macro-sectors under exam for each City in order to underline the patterns for the process of the SOMs.

Let  $u_{i,j}$  be the elements of matrix U and let:

$$\alpha_i = \frac{1}{\max_j(u_{i,j})};$$

$$\beta_i = \frac{\min_j(u_{i,j})}{\max_j(u_{i,j}) - \min_j(u_{i,j})}$$

and  $\gamma\alpha + \beta u_{i,j}$

We obtain a coded matrix Y whose elements  $y_{ij}$  yij are defined as

$$y_{i,j} = \frac{e^{\lambda}}{1 + e^{\lambda}}$$

The logistic function carries out a non-linear scaling which tends to emphasize differences among the central values of the distribution, while being relatively unaffected by differentials that occur at its extremes. In our case, this means that we are going to characterize patterns in terms of the systematic characteristics of their productive structures, without paying too much attention to isolated, atypical outliers.

Distributions are defined upon the interval [0, 1], so that the minimum value for the distribution will always be 0, and the maximum will always be 1. In this way, we are able to represent each Chinese city in terms of a pattern whose properties capture the specific way in which human resources are locally allocated across the various economic activities. Moreover, we will be able to compare these patterns in a

relatively easy and direct way, and will be able to carry out an in-depth similarity analysis.

We remind that we assumed that the pattern of the human resources allocation for each city in the 14 economic sectors serves as a good proxy for the underlying non-linear phenomena that shape the local spatial productive organization.

In doing this, we are working in the wake of previous studies, as discussed above, and attempting to introduce some substantial methodological and technical improvements. Nevertheless, there may be reasons to object, in the first place, to our focus on employment data as proxy. Rather than attempting to justify this choice, we take the opposite approach: we check whether we are able to characterize endogenously and effectively alternative patterns of spatial organization of economic activities in spite of the fact of using only a partial proxy such as employment data. As we will show, our methodology does not imply in principle that we should make use only of employment data. If we could have relied upon a richer data set containing a wider array of characteristic variables, this would have in all likelihood enhanced the power and accuracy of our results (for instance, controlling for the different levels of labour intensity of the various industries) and would have been entirely coherent with our multi-dimensional approach to industrial interdependencies. Due to the current lack of available data at the right level of disaggregation, and lacking consensus upon alternative criteria for proxies selection, we decided to stick as much as possible to the existing standards and look forward to possibly improving them in future research.

Through our similarity analysis, we will be able to find out and characterise new types of multi-dimensional patterns that do not reflect the existing conventional wisdom and can be regarded as additional prototypes (with respect to the well known concentration-based one) of representative spatial agglomeration patterns for the Chinese context.

## **5. Empirical evidence and discussion of results**

Our analysis of the spatial distribution of industrial activities in Chinese cities enables us to make some comparison in terms of attained

results, which in turn allows us to confirm the following assumptions:

- 1) the convergence of Chinese provinces' output structure;
- 2) the higher level of information disclosed in relation to the characteristics of industrial patterns in China and the dynamics of their spatial distribution;

Regarding (1) and (2), we benchmark our results with those could be attained by using an approach based on concentration indexes. First we measure the distribution of employment data in 14 industries in 288 cities (see Table 1), then verify the existence of patterns and regularities via a measure of variability and, finally, compare results. Moreover, we analyse the correlation between industries to highlight possible co-occurrences in the dynamics of spatial distribution (correlations for the 14 sectors in the 288 cities).

In relation to (3), we analyse some of the patterns identified in order to investigate the spatial organization of economic activities in Chinese cities.

**Table 1. Industrial sectors investigated**

1	'Farming'	8	'Banking & Insurance'
2	'Mining'	9	'Real Estate'
3	'Manufacturing'	10	'Social'
4	'Energy'	11	'Public Management'
5	'Construction'	12	'R&D and Technologies'
6	'Transportation'	13	'Water & Environment'
7	'Wholesale'	14	'Health & Welfare'

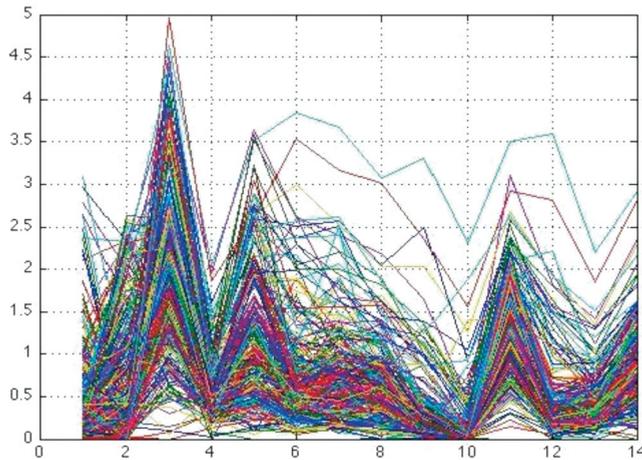
Source: our representation

Comparative analysis of the patterns of allocation of the workforce provides a range of results (see Figures 1 and 2). The analysis of concentration values shows several areas flattened towards lower values and close to zero, with the exception of those with very high concentration values (Manufacturing, Public Management and Construction).

Analysis of the patterns developed by SOM, shows a wide range

of values of the RIR, leading to results that are more credible and informative. However, in order to verify the results through less qualitative analysis it is necessary to identify a metric that defines the efficiency of the two approaches.

**Figure 1. Spatial Distribution Analysis of 288 Chinese cities**

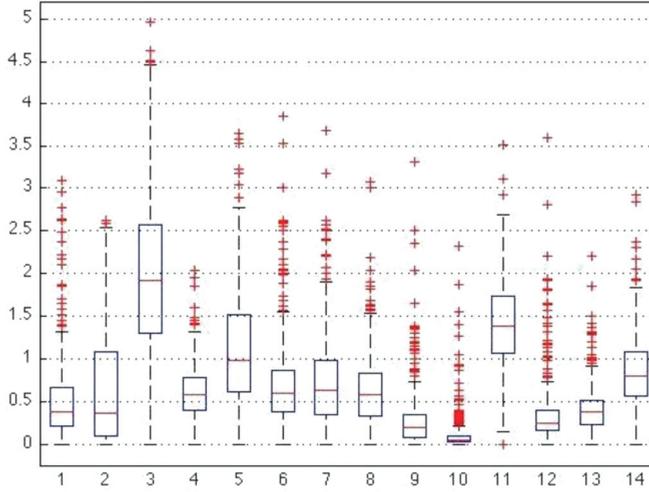


Source: our elaboration

It is possible to measure the stability of the values obtained to describe industrial patterns. Using a box-plot analysis we can measure the dispersion of the values of the indicators in each sector, calculated to represent the actual industrial patterns. This analysis emphasizes how quickly the variability in RIR, obtained through the SOM, produces an offset substantially lower than the concentration indexes. The stability of the RIR values is clearly due to the improved industrial categorization enabled by the SOM. The curves, in Figure 2, show the industrial patterns derived from the SOM network.

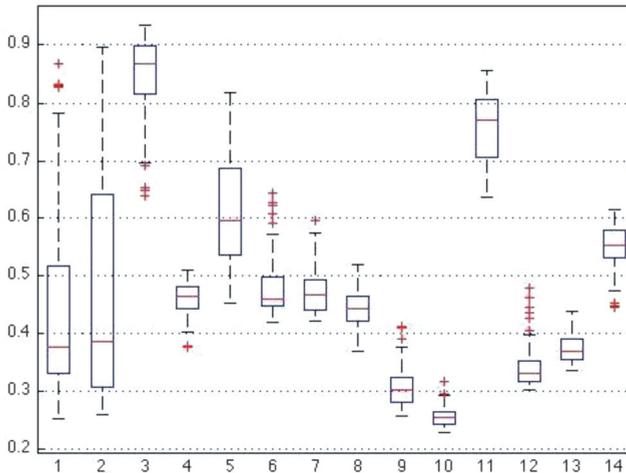
The curves in Figure 1 represent the 288 cities, and their individual degrees of industrial concentration. However, the patterns developed through the SOM seem to be a good approximation for the rules governing the evolution of spatial distribution of economic activities in Chinese cities (Figure 2).

**Figure 3. Boxplot Analysis of industrial concentration in 288 Chinese cities**



Source: our elaboration

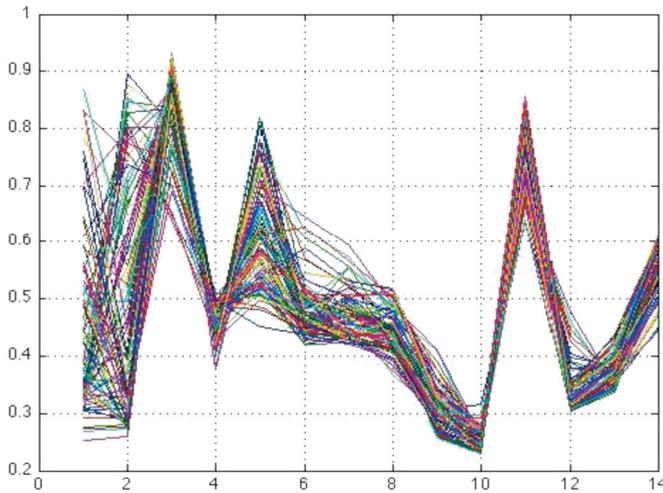
**Figure 4. Boxplot Analysis of 55 industrial patterns with SOM**



Source: our elaboration

These patterns clearly show the inter-relations that are present, and shed light on the degree of association among industries. The correlation matrix highlights this latter point.

**Figure 2. Spatial Distribution Analysis of 55 patterns of Neural Network SOM**

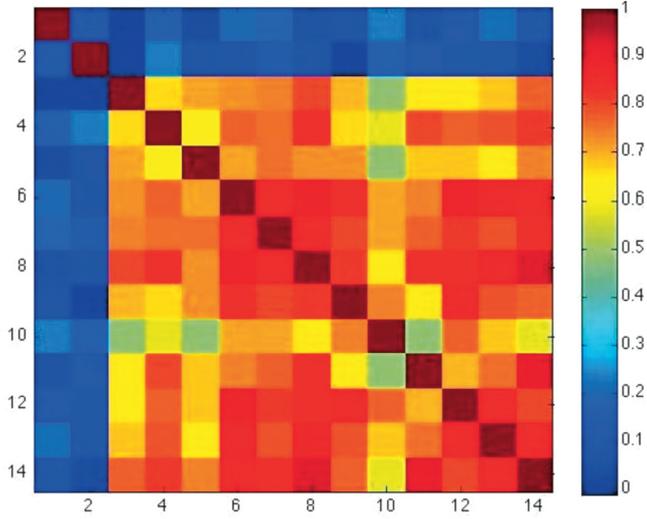


Source: our elaboration

Figure 5 shows that the correlation coefficients obtained from the data on sectoral concentration are generally positive and quite high, with the exception of 'Mining' and 'Farming' which are not positively correlated to any of the other sectors. Figure 6 shows the correlation matrix based on the RIR for each sector. We see that there are both positive and negative correlations between sectors. However, in this matrix 'Farming' and 'Mining' are still not positively associated with many areas, although 'Farming' is positively associated with 'Energy' and 'Water & Environment', and 'Mining' is negatively associated with all sectors except 'Energy'.

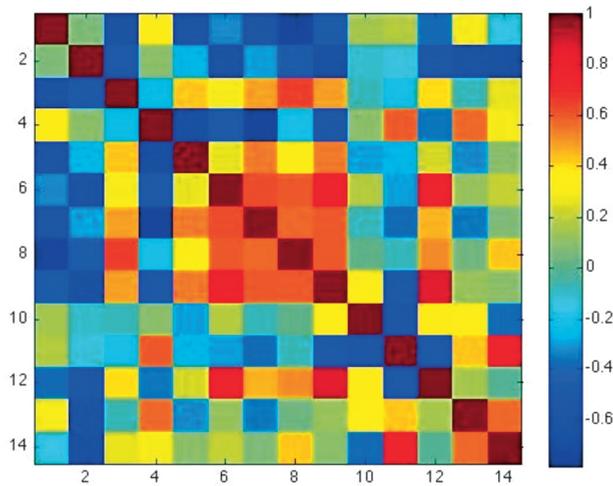
The sectors most strongly associated are 'Manufacturing', 'Constructions', 'Transportation', 'Wholesale', 'Banking & Insurance' and 'Real Estate', which we can consider to be leading sectors in the development of Chinese cities.

**Figure 5. Correlation matrix of industrial sectors of 288 Chinese cities**



Source: our elaboration

**Figure 6. Correlation matrix of industrial sectors of 55 patterns of Network SOM**



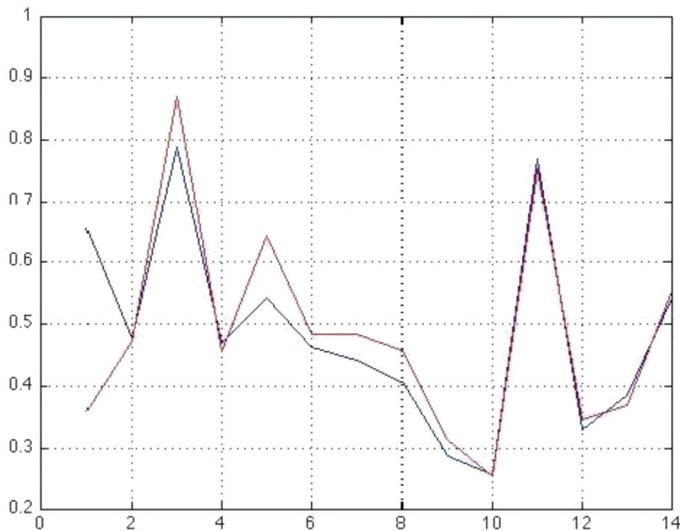
Source: our elaboration

## 6. Leverage in Commercial Banks

In the third and final part of our study we analyse the stability of the industrial patterns in Chinese cities as identified by SOM and, next, investigate the implications of variability in some areas on the form of the industrial patterns.

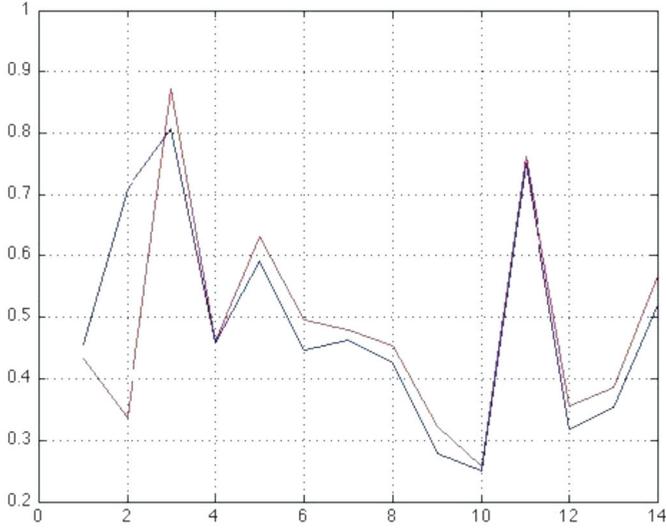
We notice that the patterns identified are stable and vary little from city to city, with some exceptions mainly 'Farming' and 'Mining', which show strong variability in terms of RIR, which requires further investigation. Figures 7 and 8 show the industrial patterns compared to the maximum and minimum RIR for 'Farming' and 'Mining'.

**Figure 7. The variation of the industrial Patterns with minimum and maximum values of RIR in 'Farming' sector**



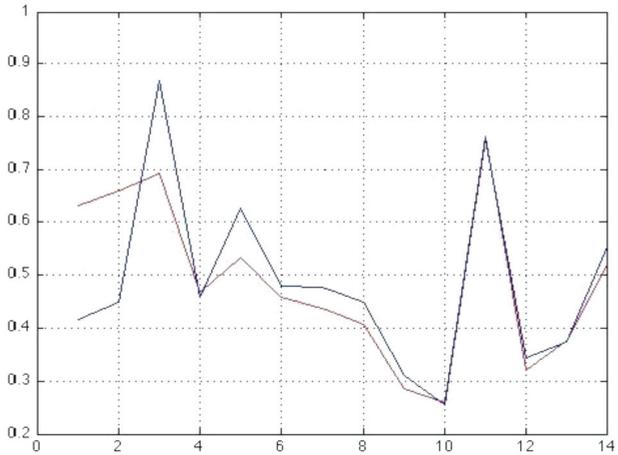
Source: our elaboration

**Figure 8. The variation of the industrial Patterns with minimum and maximum values of RIR in 'Mining' sector**



Source: our elaboration

**Figure 9. The variation of the industrial Patterns with minimum and maximum values of RIR in 'Manufacturing' sector**



Source: our elaboration

Figure 9 traces the industrial patterns with respect to maximum and minimum values of RIR for 'Manufacturing'. Analysis of these figures shows that the variations in RIR for 'Farming' and Mining' do not affect the patterns of the RIR values for other sectors which appear to be more or less constant. If we vary the RIR of the 'Manufacturing' sector, however, this causes substantial variations in the RIR values of industrial patterns, especially in the 'Construction', 'Transportation' and 'Wholesale' sectors, and generally lowers the RIR of most sectors.

To sum up, the analysis provided in this paper allows us to limit the variability of the indicator of RIR for 'Farming' and 'Mining' in relation to the effects on the industrial patterns identified. The analysis developed using SOM is significant as its results are in line with the evidence provided by other studies which make use of different approaches: the spatial distribution of productive activities in Chinese cities shows some convergence to a stable industrial pattern, especially in emerging sectors. In this respect, we define these sectors (Manufacturing, Transportation, Construction, Wholesale) as 'core' industries in the recent development of Chinese cities.

The method introduced in this paper provides some interesting scenarios that require further investigation (Mattosco and Carlei 2006).

An interesting interpretation that emerges from the analysis might concern the role played by the demographic trend in Chinese growth. With no doubt, human population levels represent one of the most explanatory variables of the formation and evolution of Chinese urban platforms and cities, which also significantly accounts for economic growth and industrial patterns.

Moreover, our results might offer further insights on the profile of the process of convergence itself.

In effect, the shape of this process can be interpreted as the result of the evolution of the set of knowledge which supports development of cities: in such a way, then, it emerges the role of human capital (see Loasby 1997) as complementary to those factors usually employed in the investigation of the determinants of the growth and development in China in the last thirty years. Common industrial patterns, then, could be interpreted as the result of a process of convergence towards a complex model of development, in terms of both productive output

and intangible assets or human capital (Carlei et al 2008), in which the latter is conceived as stratified knowledge's dynamics (Breschi et al 2009) and intersectoral spillovers (Frenken and Boschma 2007).

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Maria Pompò\*

**THE LABOUR MARKET IN THE EUROZONE DURING THE  
FINANCIAL -ECONOMIC CRISIS**

**Abstract**

*This paper presents an analysis of the eurozone labour market, highlighting limits and interventions directed at modifying its structure. Particular stress has been placed on the VAR econometric model, which confirms how productivity of labour is the cause of product.*

**JEL CLASSIFICATION:** F15, F31, F32, F33, E31.

**KEYWORDS:** LABOUR MARKET, EMPLOYMENT, UNEMPLOYMENT.

**1. Introduction**

The financial crisis of the summer of 2007 was followed by a critical macroeconomic framework, with a strong slowdown of the global economy. Low economic growth has repercussions on the labour market; if the economy is strong and growing, employment grows and unemployment falls. We must not forget, however, that the labour market is conditioned by labour policy. There are, in fact, policies that have a positive impact on the economy and that encourage growth.

Since 2008, the eurozone has seen a decline in internal demand that has limited production. In particular, consumers have postponed spending and enterprises have reduced inventories. The weakness in consumer spending was also caused by the steep reduction in financial and real estate wealth: this has led to a decline in savings by

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families, who have chosen to finance consumption. Consequently, the adjustment of employment levels to low levels of activity, has been gradual and household budgets did not initially suffer significantly the effects of the crisis. In contrast, the situation was more serious for enterprises.

This work is an attempt to identify the main determinants of labour market weakness in the eurozone. In a broader perspective we have tried to provide a framework on the limits of unemployment stabilization policies and on output. There is also a focus on econometric analysis. In particular, the empirical analysis assesses whether labour productivity is the cause of product, as is emphasized in economic theory.

The discussion is organized as follows: the issue of employment in the eurozone labour market is presented in the second and third sections. In the fourth section we briefly discuss the limits of the labour market in Italy. The fifth section addresses the problem of unemployment. In the sixth section we discuss how to overcome limitations in the eurozone's labour market. The seventh section presents the econometric analysis.

## **2. The dynamics of the labour market**

Coming now to the topic of the labour market, during the recession of 2008 enterprises chose a strategy of labour hoarding<sup>1</sup> and revised the input of labour, therefore reducing the hours of work and not intervening in the number of employees<sup>2</sup>. The demand for labour was late in adapting to low production. We must consider that low production has conditioned labour productivity: in the first phase of the crisis this decreased, but when the demand for labour adjusted to the new level of product, productivity began to increase, showing a pro-cyclical trend.

So, in the first phase of crisis, labour productivity was able to absorb the consequences of the fall of value added and job losses were contained. In the growth phase (the second half of 2009 to the end

<sup>1</sup> The labour hoarding strategy leads enterprises to avoid redundancies during periods of crisis, as they try to reduce work hours less than they reduce production. However, this is an expensive strategy: since firms bear costs for the hours not used, this strategy can therefore be used for brief periods of time.

<sup>2</sup> The reduction in hours worked has resulted in the reduction of overtime and the increase in part-time work, used mainly in 2009. Another way to reduce work hours may be making workers temporarily redundant using the wages guarantee fund.

of 2010) enterprises increased their working hours, but the effect on employment was modest, and the employment rate became positive only in the last quarter of 2010. In the first quarter of 2011 employment growth was 0.1 percent, while in the fourth quarter of 2010 the increase was 0.2 percent (ECB, 2011); (see Table 1). The recovery of production was followed by a slight growth in productivity and employment (see Figure 1), which did not, however, result in a significant increase in income. The labour hoarding strategy therefore produced a positive effect only until the first months of 2009, while from the second half of 2009 until the end of 2010 there was a substantial weakness in household income.

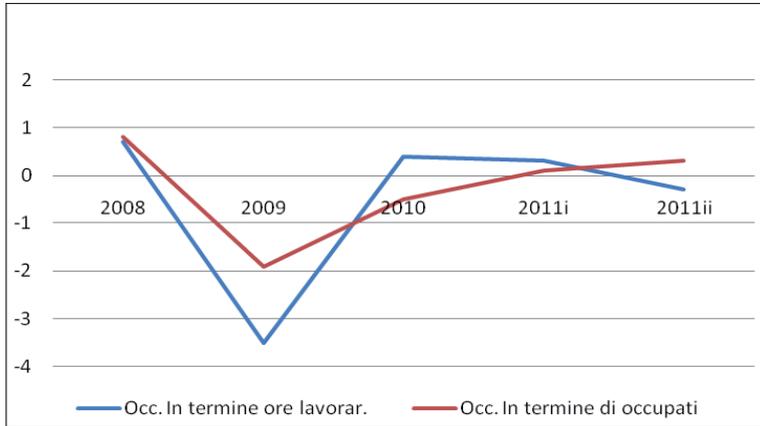
So it is evident that the economic recovery that took place in 2010 for both the euro area and for the European Union did not have a positive effect on the labour market. In fact, against a 0.4 percent increase in labour demand, there was a contraction in employment of 0.8 percent. We must nevertheless consider that labour demand<sup>3</sup> in the eurozone has recovered faster than employment.

**Table 1 Employment growth in the eurozone (%)**

Sector	Variation								
	Annual		Trim.			Annual		Variation – Variation	
	2009	2010	3 <sup>rd</sup> 2010	4 <sup>th</sup> 2010	1 <sup>st</sup> 2011	2009	2010	2010	4 <sup>th</sup> trim. – 1 <sup>st</sup> trim.
Total	-1.9	-0.5	0.0	0.2	0.1	-3.5	0.4	0.0	0.3
Agriculture fishery	-2.4	-0.6	0.3	0.4	-1.6	-2.3	-1.2	0.0	-0.5
Industry	-5.7	-3.3	-0.4	-0.2	0.0	-9.2	-1.3	-0.5	0.6
Construction	-6.7	-3.7	-1.0	-0.9	-0.8	-8.6	-3.3	-1.7	0.5
Services	-0.5	0.5	0.1	0.3	0.2	-1.6	1.0	0.2	0.3

<sup>3</sup> Labour demand, which is measured by hours worked, underwent a strong contraction in 2009.

**Figure 1. Employment**



Blue: Employment in terms of hours worked  
Red: Employment in terms of people working  
Source: Eurostat, our elaboration

### 3. Evolution of labour market and employment

It should be noted that the evolution of the labour market has not been homogeneous, in either the euro area or in the European Union. The European labour market, in fact, presents different sectoral trends. This means that some areas were more affected than others by the crisis. The hardest-hit sectors were industry and construction, with repercussions on the employment structure. In times of crisis the employment structure follows different dynamics than those of normal periods. Normally, the sectors that suffer little from the phases of the economic cycle and that have stable employment levels take on a relatively greater weight than the weakening sectors. With the crisis, in fact, sectors such as construction and industry, which have had a decisive role for employment in 2000s, have sustained job losses and, therefore, their weight in the employment structure has been reduced. In contrast, a sector that has taken a leading role in the employment structure, with increased levels of employment, is the services sector. (Table 1).

The greater relative importance taken on by the service sector in the employment structure depends on the decline in other sectors for its growth in absolute terms.

The critical situation requires comprehensive strategies that allow fiscal consolidation and the accomplishment of structural reforms. This is especially true in the labour market, where fiscal distortions are most evident, such as the tax wedge, which increases costs and lowers the demand for labour. To improve employment it is appropriate to place attention on public spending, because it represents a tool for supporting the long-term economic growth. This of course is only true if one considers production costs (such as investment and education) rather than redistributive.

#### **4. The labour market in Italy**

For the euro area, 2010 was a year of economic recovery, and the end of the decline in labour demand. This trend also occurred in Italy, where losses in terms of employment levels were smaller than those recorded during the recession. With regard to sectoral trends, reactions noticed in Italy were different from those of the eurozone. In Italy there are, in fact, sectors where the demand for labour has reached the same levels as product, or rather, sectors in which labour demand has not adjusted to the low level of product. The industrial sector is that in which the fall in activity was marked. This phenomenon has contributed to changing the production structure, which in Italy had a strong industrial base. The number of those employed in industry today represents 19.4 percent, with a loss of three points over the year 2000. As previously said, the services sector is the one that has had an increase in employment, representing 69 percent, relative to 66 percent in 2000 (Istat, 2011).

##### **(Youth employment in Italy)**

Youth employment presents a diminishing trend, which was already present before the crisis because of several factors, such as the prolongation of the scholastic curriculum, which has lowered the propensity to seek employment. This phenomenon has worsened with the crisis. Lower employment levels have been recorded for the 15-24

age group, also because a small number of these young people seek to enter the labour market. On the other hand, employment in the central 35-54 age group has increased. In reality, this is merely a demographic phenomenon in that there are greater numbers entering the labour market than there are leaving. Employment levels, consequently, are also falling for this age group<sup>4</sup> (Table 2.). The group in which labour market entry is most concentrated, with the highest number of workers, is that aged 25-34.

Low levels of employment are measured in southern Italy, confirming a trend already present before the crisis<sup>5</sup>. In the wake of the crisis, the South has lost 87,000 jobs.

Low employment has hit males especially hard, with a loss, in 2010, of 430,000 jobs. This is explained by the fact that the crisis has affected sectors (e.g. industry, construction) with a low presence of women (respectively 27 and 5 percent of employment); (Istat, 2010). Employment among women in 2010 was substantially unchanged, as the employment of women has been favoured in service sectors with low skills.

In general, we can say that unskilled employment has increased. This reflects the dualism of the Italian labour market. (Table 2).

<sup>4</sup> We find the breadwinners, that is, the main earners in the family, in this class.

<sup>5</sup> A strong divergence emerged between the occupational levels in the North and those in the South starting in 2002. The gap between North and South is remarkable, accentuated by the fact that in the South there is little recourse to temporary redundancy using the wages guarantee funds.

**Table 2. Employment rate in Italy by age and profession**

	Var.% 2009/10	V.a. ('000)	V.a. ('000) vs. 2008
<b>Age</b>			
15-34	-5.7	-75	-235
25-34	-5.5	-293	-619
35-54	0.8	107	107
55-64	4.1	107	233
65 and up	0.3	1	-18
<b>Gender</b>			
Men	-1.1	-155	-430
Women	0.0	3	-103
<b>Area</b>			
Northwest	-0.7	-50	-130
Northeast	-0.3	-17	-98
Centre	0.0	1	-24
South	-1.4	-87	-280
<b>Employment</b>			
Executive	-7.1	-70	-174
Intellectual prof.	-3.3	-77	-141
Technical prof.	-2.2	-103	-347
Clerical	2.4	61	80
Sales and services	0.8	32	71
Artisans	-2.5	-109	-125
Plant workers	-1.4	-26	-140
Unskilled personnel	5.8	130	229
Armed forces	4.0	10	16
Independent workers	0.2	14	-196
Dependent workers	-1.0	-167	-336
<b>Working hours</b>			
Full time	-1.6	-308	-623
Part time	4.7	156	90

Source: Istat (2010)

Regarding self-employment, 2010 saw an upturn<sup>6</sup>, or rather a stabilisation, that favoured the end of a decade-long trend of decreases. It must however be noted that in reality this is not true self employment, but young people with VAT registration numbers, workers in positions similar to those of fixed-term employees. It therefore refers to “false self-employment”, since they are self-employed only for regulations regarding labour, taxation and benefits but have little autonomy over their schedules. In 2010 there was also a revival of temporary

<sup>6</sup> In the last two years these forms of employment have experienced a strong contraction.

employment, which in the first phase of the crisis was the most affected (those employed in 2009 decreased by 7.3 percentage points). The first jobs created after the passing of the acute phase of the crisis were flexible ones. The workforce involved in this type of work are particularly youth and women, i.e., disadvantaged classes that are likely to remain in uncertain positions, without ever arriving at a standard job. An increase in this form of work has also been noted for the middle social classes, meaning that it is not only used for entry into the labour market but also as a form of flexibilisation in a recession phase. It is, in fact, involuntary temporary employment, accepted by workers in the absence of alternatives, knowing that there are fewer guarantees and with lower pay than that received by permanent workers. Another type of labour growth is the part time job, increased by 4.7 percent in 2010. This too is involuntary part-time employment, imposed by enterprises to face the recession by reducing the demand for labour.

The crisis has hit workers having a low level of education. Having a medium-high level of education has permitted the maintenance of a high employment performance (see Table 3).

**Table 3. Employed by educational level (2007-2010)**

	Total (15-64)		(youth 25-34)	
Degree and post-graduate degree	286 (thousand)	7.9 (Var %)	-41 (thousand)	3.7 (Var %)
4-5 year high school Diploma	210 (thousand)	2.5 (Var %)	-246 (thousand)	-9.7 (Var %)
2-3 year high school Diploma	41 (thousand)	2.4 (Var %)	-28 (thousand)	-7.1 (Var %)
Middle school	-496 (thousand)	-6.7 (Var %)	-380 (thousand)	-24.1 (Var %)
Primary school certificate, and no certificate	-391 (thousand)	-25.4 (Var %)	-38 (thousand)	-27.9 (Var %)
Total	-350 (thousand)	-1.5 (Var %)	-732 (thousand)	-12.7 (Var %)

## 5. The trend of unemployment in the eurozone

The economic crisis has resulted in an increase in unemployment in the eurozone; currently equal to 10.1 per cent, it is the highest figure since 1998 (Figure 2). In the 27-member Union, the unemployment rate

stood at 9.7 percent. Unemployment among men has increased from 9 percent to 10 percent. In the EU-27 it increased from 8.7 to 9.8 percent. The rate among women increased from 9.5 percent to 10.2 percent (Eurostat, 2011). Although growth has been generalized to all eurozone countries, it nevertheless shows a different trend from country to country. Italy, for example, has a lower unemployment rate than the European average, but a high rate of the labour force that is unused.

Regarding an international comparison, the unemployment rate is higher in the U.S. than in Europe<sup>7</sup>. In fact, the American labour market is currently characterized by the presence of structural unemployment, because the economic recovery, between mid 2009 and early 2011 did not produce positive effects on unemployment. This phenomenon is explained by the presence of both spatial and sectoral mismatch, but also the current weaknesses in the housing market<sup>8</sup>. In the U.S., in fact, unemployment numbers are greater than the NAIRU.

The current scenario in the euro area is better. The eurozone is characterized by a low growth rate of unemployment<sup>9</sup>. The key to understanding this phenomenon lies in the maintenance of employment levels<sup>10</sup>, despite low GDP growth.

It should be noted, however, that the rate of unemployment in the eurozone has a mixed pattern. There are countries, such as Germany, which has low structural unemployment and a substantial stability in labour costs. Most euro area countries, however, show substantial changes in wage dynamics<sup>11</sup>. This is particularly true in Greece and Ireland, where wages have been considerably reduced compared to growth during pre-crisis years. It is therefore evident that a substantial change in labour costs is taking place in the eurozone. The trend being

<sup>7</sup> It was noted that the U.S. was facing long-term unemployment, i.e. lasting for more than two years. During the '80s, unemployment reached 11 percent, but came back down after only two years. In fact, in 1982, unemployment was around 7 percent. The same thing happened during the crisis of the '90s. Initially, the unemployment rate rose to 7.8 percent, but it was reduced in '92 to 6 percent.

<sup>8</sup> Although the U.S. labour market is characterized by the mobility of the workforce, the crisis has nevertheless made it difficult to travel, both because workers cannot easily sell their homes, and because often its sale does not allow the seller to pay off the mortgage with the bank.

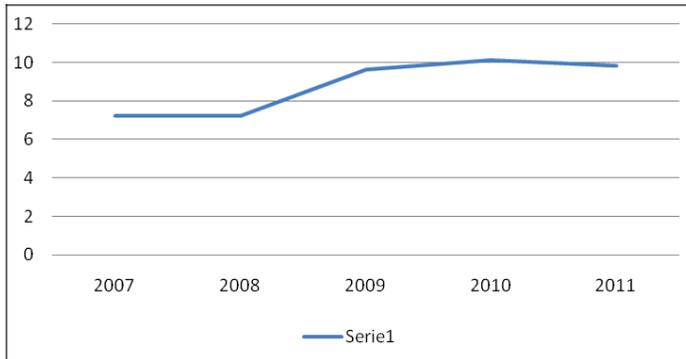
<sup>9</sup> The unemployment rate is lower relative to the rate in the '90s.

<sup>10</sup> Thanks to the strong use of part-time jobs.

<sup>11</sup> Many of the countries in the area present cumulative variations of between 4-7 percent, about 1.5-2.5 percent average per year against a wider range of between 4 and 18 percent in the previous three years.

asserted is that of a strong downward pressure on wages in those countries with a critical situation.

**Figure 2 Unemployment %**



Source: Eurostat, our elaboration

*(Unemployment in Italy)*

Regarding Italy, we observe that the unemployment rate increased in 2010, involving 158,000 people. The phenomenon has reached high levels especially in the South, where the unemployed account for 45 percent of all unemployed Italians (ISTAT, 2010). Although unemployment has reached high values in the South, the crisis has nevertheless led to its considerable increases in the North and Northeast, where, in 2010, it increased by about 18.7 percent (ISTAT, 2010). So with the crisis, an increase of unemployed people in the North has emerged (see Table 4). In contrast, in the South there has been real inactivity due to the difficulty of those who have lost jobs to re-enter the workplace. Moreover, following the recession an increase has been seen of unemployed people with previous work experience<sup>12</sup>. Long-term unemployment is not a purely Italian phenomenon, but also covers Spain, United Kingdom, and Germany.

The Italian labour market is characterized as well by the presence of mismatch. The imbalance between the unemployed and positions leads to putting into effect policies that not only must identify a

<sup>12</sup> This deals with the group of unemployed who most rapidly find work, that is, in under 27 months.

demand for additional labour, but, above all, to remove the causes of the imbalance. There are different origins of the mismatch in Italy. One speaks of territorial mismatch in the sense that there are areas where unemployment is high and areas where there are good job opportunities<sup>13</sup>. Then we have mismatch due to levels of education, that is, the education system does not respond to the needs of the demand for labour; in particular, many degree programs do not provide the appropriate skills to enter the labour market<sup>14</sup>. In fact, some graduates may have higher unemployment rates or lower wage levels than those with just a high school diploma. It is therefore evident that we are facing a problem of over-education. Another phenomenon that characterizes the Italian labour market is under-employment (skill mismatch). This is a phenomenon on the rise. Ever more frequently, in fact, workers are employed in duties requiring skills inferior to their training. Skill mismatch is caused by both limited opportunities for skilled labour, as well as growth in higher education<sup>15</sup>.

## **6. Medium-term prospects for employment in the eurozone**

In 2011, on the one hand we have a level of production that struggles to grow and on the other we have a low demand for labour. In this context, labour productivity recovered over the period 2008-2009. Growth prospects are pessimistic. The growth rates for both GDP and labour demand are slow and return to pre-crisis growth rates will have to wait until 2015. A slowdown of GDP and therefore of production is expected. These low growth prospects will have a negative impact on the labour market.

The European Union, however, in line with the Europe 2020 strategy, attaches priority to employment growth to be achieved through appropriate reform of the labour market. Structural reforms

<sup>13</sup> This means that the imbalances present in the Italian labour market are tied to the rigidity of prices and wages.

<sup>14</sup> In that sense it's appropriate to improve schools and universities, because this means improving human capital and, so, making labour productivity grow. In Italy it has been stagnant for more than fifteen years.

<sup>15</sup> Italians holding a degree in 2000 were 10.6 percent; in 2009, they passed to 20.7 percent. In Europe the percentage is decidedly higher at 33 percent. In Great Britain it is 40.7 percent and in France, 42.9 percent (Eurostat, 2010).

are therefore considered compulsory, as they can generate benefits even in the short term.

(The prospects for Italy)

It is clear that Italy's growth problems predate the crisis, since Italy is characterized by slow growth in productivity, which has been stagnant for over ten years. One factor that limits growth in Italy is the high unemployment rate, which the South has doubled (see Table 4). Therefore, the unemployment rate has by now become a structural datum.

The reduction in the unemployment rate depends on many factors. If, for example, new jobs are created that are similar to those destroyed, this would allow for the reintegration of the unemployed. If new jobs are totally different, then there is the problem of how to absorb unemployment, meeting problems of mismatch. The trends show an increase in demand for skilled labour and a contraction in labour demand for workers and clerical workers. The outlook for the labour market, after losses suffered in 2008-2009, is not positive, because the employment level in 2011 is not able to change the economic situation that has emerged from the crisis. The year 2011 should have been the year of stabilisation for the economy, especially for the labour market.

Regarding forecasts, it is opportune to be very prudent, as the seriousness of the 2008-2009 recession is not comparable to the slow recovery of the second half of 2009 to the beginning of 2011.

For the recovery of the labour market and of growth, economic policy must operate different levers. First, one must act on the employment rate, not only because it means more income for families but especially because it means economic growth. In Italy, we have seen a 5% reduction in hours worked per employee from 1993 to 2010 (Istat, 2011)<sup>16</sup>. This variable has therefore contributed negatively to the dynamics of hours worked per capita. This negative trend was caused by the increase in part-time work<sup>17</sup>, particularly when involuntary. The other variable to be monitored is the unemployment rate, which rose with the crisis.

<sup>16</sup> Before the crisis, in 2007, per-capita hours worked had increased by 4 percent, because of the positive contribution of 7 percent of participation in the labour market and a decrease of 5 percent in unemployment, and because of a fall of - 4 percent of hours worked and an increase in the dependency ratio of - 4 percent (ISTAT, 2011).

<sup>17</sup> This type of labour favours women's employment but has not had a positive effect on labour inputs.

Finally, a lever is needed to act on the rate of activity, which especially in the South collapsed following the crisis. This phenomenon was the result of discouragement on the part of the labour offer because of falling demand.

Identifying priorities of economic policy means putting into practice some first changes in a country where per capita GDP reflects a trend of stagnant productivity. Thus, for growth, it is key to break down the labour factor. As we noted earlier, the variable of hours worked per capita is the one that determines the contribution of the labour factor to growth. The attention to the variables mentioned above clearly shows that the loss of per capita GDP reflects the trend in labour productivity. The deterioration of the labour market that emerged with the crisis does not depend only on the decline in employment but also on a structural weakness. Therefore, the passive policies, or support of those who have been hardest hit by the crisis, must be integrated with active policies, including through greater integration among school, university and work.

**Table 4. Unemployment rate in Italy (2011)**

<b>Region</b>	<b>total</b>	<b>15-29 years</b>
Piedmont	7.3	17.9
Aosta Valley	4.8	10.8
Liguria	4.4	16.3
Lombardy	5.3	12.9
Trentino A.A.	3.4	7.3
Veneto	4.4	13.2
Friuli V. G.	4.1	13.1
Emilia Romagna	5.0	15.0
Tuscany	6.0	15.5
Umbria	6.5	14.9
Marche	5.8	13.0
Lazio	7.3	22.0
Abruzzo	7.9	22.7
Molise	9.6	20.0
Campania	15.5	33.6
Apulia	11.6	27.6
Basilicata	12.1	32.9
Calabria	12.0	29.4
Sicily	14.3	33.2
Sardinia	13.0	31.0

## **7. Empirical analysis**

The Autoregressive Models (VAR) were developed by Sims (1980) following of the failure of the Systems of Simultaneous Equations (SES). They are statistic models of Historic Series of Multiple Dynamic Variables where each variable is related with all the others variables. By VAR we try to explain the relationships among the economic variables; in other words, we try to describe the relationship among the variables by using correlation of the system of variables to achievesome previsions.

In according to the Connection of Causality by Granger, if the “x” event appear before the “y” event we can assume that the “x” event has produced the “y” event. These Models do not describe the entire economic system because they use a limited number of variables Y (Vector NX1). In the VAR Models all the variables are endogenous, on the contrary all the shocks are considered exogenous.

The analytical expression used is as follows:

Autoregressive model of order p

$$[1] \quad Y_t = \sum_{i=1}^p A_i Y_{t-i} + \varepsilon_t$$

We have verified the existence of the Granger causality relation at an empirical level, from 2007 to the 1st semester of 2011.

The analysis was carried out using VAR with robust standard errors (S.E.), that is, attempting to limit the standard errors in the model plus a self-generated constant.

The presence of autocorrelation between the variables has necessitated the transformation of the variables into prime logarithmic differences. Subsequently, against a test of Durbin-Watson even greater than 2, we delayed the variables in order 4. So there is no autocorrelation. For productivity it is noted that the lag time of 4 lags are all significant in the first equation. In contrast, production is significant only at 7.8 percent for the first lag.

The lag order 4 turns out, therefore, optimal and, from the Ljung-Box test of we have observed that the first equation presents correlated residues. We conducted a test on the normality of the residuals (D-H),

where it was found that rejecting  $h_0$ , the residuals were normal. With residuals normalized we made a new VAR reinserting into the model in the constant and the trend.

As can be seen in the period considered, the result was sufficient to show that productivity causes production in the Granger sense, confirming the economic theory<sup>18</sup>.

## 8. Conclusion

The research has underscored the limits present in the eurozone labour market.

The analysis took into consideration the recession phase and how that phase has involved the labour market, highlighting structural difficulties. In most countries restrictive economic policies are operating, and consequently the demand for labour reflects low production. In this context, therefore, employment has declined. The phenomenon is particularly accentuated in Italy, where job opportunities have diminished. The greatest difficulties were recorded in the South, accentuating an already-negative trend.

It has also aggravated the unemployment rate, which in the increased version has reached elevated numbers and long durations. This, therefore, means structural unemployment.

Faced with this scenario and in this particular phase of the cycle when the difficulties of the labour market are worsening, passive policy is supplanted by active policies aimed at supporting the return of workers to production systems. For the current year the GDP of the area will not grow, and so the demand for labour will not undergo large changes, able to transmit substantial changes to the labour market.

Finally, we have verified through the VAR models that productivity causes production. This information confirms the economic theory.

<sup>18</sup> See annexe.

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### Annexe: VAR analysis section 8

VAR system, lag order 4

OLS estimations using observations 12-60 (T = 60)

Log-likelihood = 240.93506

Determinant of the covariance matrix = 6.5361279e-012

AIC = -18.4113

BIC = -17.4295

HQC = -18.1508

Portmanteau test: LB(6) = 16.518, df = 8 [0.0355]

Equation 1: ld\_Prodity

Robust standard errors with respect to heteroscedasticity, HC1 variance

	<b>coefficient</b>	<b>std. error</b>	<b>t-ratio</b>	<b>p-value</b>
const	-0.00604638	0.00170236	-3.552	0.0032 ***
ld_Prodity_1	-0.589523	0.167608	-3.517	0.0034 ***
ld_Prodity_2	-0.492567	0.253724	-1.941	0.0726 *
ld_Prodity_3	-0.377697	0.185680	-2.034	0.0613 *
ld_Prodity_4	-0.120619	0.286180	-0.4215	0.0998 *
ld_Prodion_1	-0.0473242	0.0334145	-1.416	0.0786 *
ld_Prodion_2	-0.0764477	0.0757385	-1.009	0.3299
ld_Prodion_3	-0.191351	0.153503	-1.247	0.2330
ld_Prodion_4	0.133181	0.235642	0.5652	0.5809
time	2.04082e-05	4.26052e-05	0.4790	0.6393

Average dependent variable value -0.002158 ASQ dependent variable 0.001341

Sum of squared residuals 0.000022 S.E. of the regression 0.001266

Square-R	0.457587	Corrected Square-R	0.108892
F	5.765370	P-value(F)	0.001939
Rho	-0.019399	Durbin-Watson	2.021724

Note: ASQ average squared residual; S.E. = standard error

F Test for zero restrictions:

All ld_Prodity lags	F(4, 14) =	3.3222	[0.0412]
All ld_Prodion lags	F(4, 14) =	1.9127	[0.1642]
All variables, lags 4	F(2, 14) =	0.17540	[0.8409]

Equation 2: ld\_Prodion

Robust standard errors with respect to heteroscedasticity, HC1 variance

	coefficient	std. error	t-ratio	p-value
const	0.00615227	0.00900749	0.6830	0.5057
ld_Prodity_1	1.57781	1.28849	1.225	0.2410
ld_Prodity_2	1.15335	1.07749	1.070	0.3025
ld_Prodity_3	1.07318	1.07293	1.000	0.3342
ld_Prodity_4	1.59314	0.967614	1.646	0.1219
ld_Prodion_1	-0.275956	0.146758	-1.880	0.0810 *
ld_Prodion_2	-0.0653059	0.107195	-0.6092	0.5521
ld_Prodion_3	0.253671	0.476449	0.5324	0.6028
ld_Prodion_4	0.150929	0.537668	0.2807	0.7830
time	0.000251209	0.000150192	1.673	0.1166

Average dependent variable value -0.001172 ASQ dependent variable 0.003740

Sum of squared residuals 0.000168 S. E. of the regression 0.003467

Square-R	0.477071	Corrected Square-R	0.140902
F	0.693338	P-value(F)	0.705198
Rho	-0.068090	Durbin-Watson	2.084479

Note: ASQ = average squared residual; S.E.= standard error

F Test for zero restrictions:

All ld_Prodity lags	F(4, 14) =	0.99235	[0.4437]
All ld_Prodion lags	F(4, 14) =	1.0673	[0.4090]
All variables, lags 4	F(2, 14) =	1.6225	[0.2324]

For the system overall:

Null hypothesis: the greatest lag is 3

Alternative hypothesis: the greatest lag is 4

Test of the likelihood ratio: Chi-squared(4) = 9.86342 [0.0428]

Comparison of information criteria:

Lag orders 4: AIC = -18.4113, BIC = -17.4295, HQC = -18.1508

Lag orders 3: AIC = -18.3336, BIC = -17.5482, HQC = -18.1253

VAR with normalised residuals

Determinant of the covariance matrix = 8.4270087e-012

AIC = -18.3238

BIC = -17.4403

HQC = -18.0894

Portmanteau Test: LB(6) = 14.2561, df = 8 [0.0753]

Equation 1: ld\_Prodtion

	<b>coefficient</b>	<b>std. error</b>	<b>t-ratio</b>	<b>p-value</b>
const	0.0117470	0.00597358	1.966	0.0680 *
ld_Prodity_1	-0.101678	0.224904	-0.4521	0.6577
ld_Prodity_2	0.132847	0.222946	0.5959	0.5601
ld_Prodity_3	0.387987	0.562753	0.6894	0.5011
ld_Prodity_4	0.239394	0.589841	0.4059	0.6906
ld_Prodtion_1	1.66654	0.816482	2.041	0.0592 *
ld_Prodtion_2	1.11798	0.852119	1.312	0.2092
ld_Prodtion_3	1.07878	0.785139	1.374	0.1896
ld_Prodtion_4	1.71102	0.711921	2.403	0.0296 **

Average dependent variable value -0.001172 ASQ dependent variable 0.003740

Sum of squared residuals 0.000216 S.E. of the regression 0.003791

Square-R	0.329978	Corrected Square-R	0.027367
F(8, 15)	0.923417	P-value(F)	0.5246068
Rho	0.039631	Durbin-Watson	1.917708

Note: ASQ = average squared residual; S.E.= standard error



Luigi Panzone\*

## USING DEBT IN FUNDING THE ENTERPRISE PRODUCTIONS

### Abstract

*Debt and corporate assets play a fundamental role in enterprises events. The traditional Doctrine states that they do not affect the process of value formation; not so in imperfect financial markets. In this respect, the ability to stock up capital can affect the composition of the investments and, consequently, the return of such investments (ROI); therefore, the effect of the financial leverage could not register the same impacts on the return on equity (ROE). Such evidence becomes important for the banks, since the negative effects of a modest level of capitalization are well-known on the stability of intermediaries and then on the whole economy.*

**JEL CLASSIFICATION:** E22; E62; H63; O16.

**KEYWORDS:** DEBT, ASSETS, VALUE, RETURN ON EQUITY (ROE), STABILITY, DEVELOPMENT.

### 1. The Nature of Financial Constraint

In modern monetary and credit-based economies, the realization of economic processes of production-consumer-savings-investment requires the use of money to regulate exchanges: that is to say it needs, on the part of individuals, the availability of monetary stocks preceding the realization of productivity and investment plans as well as the satisfaction of individual needs (on the part of families) and collective needs (on the part of the Public Administration).

Monetary types are attributable to legal money offered by central institutes of emission and other bank payment instruments, paper and electronic. The latter, thanks to the convenience of utilization are

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so widespread that they represent the major part of the “common circulating” (money supply).

Therefore, the close relationship between money and bank credit (loans): the latter, thanks to the use of cheques, determines an expansion of monetary circulation. So, according to the Doctrine assertion, every unit of money and credit is also a unit of capital.

Consequently, a producer who wants to realize his own plan of investment has to constitute a first stock of financial capital, linked to the size of his needs: quantitative, to realize entirely the productive project; qualitative, in a sense of a correlation between the duration of funding and timing of realization of the management operations, as well as between the profitability expected by the latter and the costs of remuneration paid out to capital. The producer’s project will then materialize in the company if it meets the original financial constraint, which will impose the need for an harmonious evolution of acquisitions and capital reimbursement during the entire life of the production cycle of the company, as well as the need for an adequate remuneration of the above mentioned.

It must also be said that modern processes of creation and distribution of value (wealth) generally imply a separation between the centres of formation of savings (understood as the stock of financial capital) and centres of investment; the latter willing to use in the productive processes greater amount of resources than originally possessed. On the other hand, the industrial economy has widely shown that enterprises cannot support their development using only internal resources (self-financing), that is to say, the capital resources of the promoter (economic agent); for this reason, it is necessary that financial surpluses, especially combined surplus, will be used adequately for those in deficit, typically enterprises and the Public Administration.

Hence, was born a need for brokerage made by modern financial systems with the purpose to allocate the available capitals towards the most deserving borrowers: that is to say, to those companies with adequate capacity of reimbursement and “payment” of reasonable compensation to the resources received, proportional to the time of use (management constraint) and risks taken (especially for failure of reimbursement).

The markets today do not show always the capacity to fulfil their original function, nor also their operating intermediaries; so that the “modern finance” is more and more an end in itself, in search for short

term monetary gains, rather than aimed to satisfy (solve) the financial constraint of the enterprises and the families (Panzone, 2010).

Nevertheless, the solution of the problem described is still central and very critical for the whole economy of productions; especially, in the presence of strong imperfections of the financial system and the consequent lack of resources for those in deficit, the development of income and employment will suffer badly with negative repercussions on the lives of businesses and households.

## **2. Heading styles**

An enterprise project will then, have to be able to attract the necessary capitals in quantity and quality useful to define a correct financial structure; judged such in presence of a volume of production beyond the threshold of break-even point, of an harmonious relationship between resources and investments as well as between the profitability of the latter and the expected profit of the holders of capital.

Namely, in the presence of a qualified demand for goods and services, the volume of revenues will also be determined by the availability of resources to finance the consequent production processes; the allocated capital will be repaid after the recovery of the money from factor inputs, through the collection of revenue and/or disposal or sale or discontinuity of the assets; the level of remuneration offered to the lenders will not be in fact higher than the economic results achieved through the operations of management.

The separation between the centres of formation of savings and investment creates a need for financial intermediation which will be able to realize if capital holders will be in the condition to rationalize the opportunity of investment in the market: that is, to be able to know, with sufficient approximation to the truth, the risk of default of reimbursement and payment of the agreed compensation (debts), or expected (shares). As it is notorious, these conditions are essentially related to the quality of management processes conducted at the deficit units; while the chances of reaching a correct opinion about the characteristics of the use of the capital are based on correct information (communication) from the borrower of funds to the market, as well as the processing capabilities of the latter (information) into knowledge.

In this regard, it is important to underline the distinction between the direct circuit (markets) and indirect transfer of funds (credit intermediation): the former characterized by public information and by the work of professionals specialist operators (financial analysts and brokers) capable of rationalizing alternative choices of investment for themselves, or on behalf of clients; the latter characterized by private information based on the exclusive broker-borrower relationship (soft-information) determine, in general an advantage contractual for the bank in defining the contract of the financing conditions, and this, even more in systems of the type bank-based.

Therefore, two main problems in the enterprise:

- to make clear the key features of the production carried out by means of appropriate communicative policy to the market and to skate-holders in general;
- an efficient functioning of markets, securities and credits, so the most deserving companies can get the necessary capital in the qualitative and quantitative aspects suitable to the resolution of financial constraint, in the presence of reduced transaction costs to a minimum.

It is also evident that the allocation of resources cannot come principally from the property capital since there is generally a strong divergence between the target functions of borrowers (companies) and providers of funds (families): the former, with a considerable propensity to risk, in search of capital permanently tied to the enterprise and in terms of minimum cost; the latter strongly oriented to the preservation of financial wealth, mainly in search of short term investment with low levels of risk. It follows, in some cases, the centrality of credit intermediation as it is in our Country, because of the preference of savings toward the financial liabilities issued by banks, judged (not always correctly) a lower risk and greater liquidity; in other cases, can be recorded some development of the market circuit , but primarily for the interest shown by private investor for public debt securities.

So, as a matter of fact, all are leading to a substantial lack of capital available for businesses in the direct channel (securities market).

The stockpiling of resources with a permanent constraint for the management may be affected in a negative way since smaller companies, usually precluded from access to securities markets, can only rely on the capital resources of the economic entity and processes of self-

financing; the experience has widely demonstrated that such resources are usually insufficient to finance the natural cycle of development of the enterprise, thus assuming an increasingly central role of debt capital of commercial nature (providers-banks), mainly of bank origin.

Therefore, the composition of liabilities of the enterprises and consequently the financial structure are greatly affected by these imperfections in the system of distribution of resources, accentuated by large asymmetric information and dominance of intermediaries.

In other words, the opportunities of funding for companies, in cases not rare, do not present solutions in accordance with the needs of corporate equilibrium (capital and financial) which suggest this or that configuration of liabilities (capital ownership and credit) depending on the nature of the production already made (capital intensive-labour intensive); but rather a prevalence of debts because of the inability of the entrepreneur to bring personal resources since the hoarding of capital on securities market is precluded.

On the other hand, the banks do not seem to be able to overcome the lack of fixed assets in enterprises (bonds and shares), as their own needs for balance discourage the acquisition of assets in the portfolio, such as long-term maturity and higher risk after a threshold minimum. Therefore, the prevalence of debt is to be referred to an overwhelming incidence of the short terms, which usually show a burden of remuneration also characterized by greater variability in relation to market trends with adverse effects on the economic dynamics of management that demonstrate a marked instability.

The negative impact on the company, resulting in prevalence of debt in the financial structure, are essentially attributable to:

- great financial risk connected to the misalignment between the timing of the realization of the ongoing operations and the reimbursement of loans and, in general, due to the preponderance of capital maturity compared to those permanently bound to the management;
- the growing instability of income in formation, because of the increased variability of the cost of short-term debt in relation to market volatility;
- the lack of fixed capital due to insufficient allocation of long-term maturity funds, with negative repercussions on technological input, on processes innovation, on productivity and cost management.

### **3. Conditions of investment and remuneration of capital granted: Extra Profit**

The concrete possibilities of equitable remuneration for the capital granted are due to conditions of its investment: namely, profitability resulting from the performance of ongoing operations represented by the assets of the financial structure (capital invested). Indeed, it must determine an economic result (profit or loss) from the management of the operations (before taxes) that would allow payment of the agreed interest (tax deductible) and the payment of dividends (after income taxes) in accordance with the expectations of shareholders or of the extent of a net income considered satisfying (ROE - Return on Equity).

In summary, extrapolating data from financial statements, the gross operating result is the sum of financial charges to the profit before tax for the period; such a configuration value (R.op.gross) when compared to the capital invested (to the net of values adjusted) measures the ROI (Return on Investment).

In real markets, interest (financial gain) received by the holders of capital by way of credit, is not determined in relation to the size of the ROI, that is the economic capacity of the enterprise, but, by virtue of the level of average market rates, of the specific conditions of the risk and of the duration of individual funding, as well as the bargaining power of the parties or contractors generally with a prevalence of the intermediaries. This is due, on the one hand, to the content of the monetary policies that prefer the goal of preserving the value of money for the purpose of economic and industrial policy, on the other hand, to the remarkable imperfections of the market and to the profile of a finance of an increasingly “an end in itself” for the purpose of short-term “money profits” rather than aimed at carrying out the original “mission” of effective and efficient transfer of resources from surplus units to those in deficit (Panzone, 2010).

In such scenarios, the return on capital allocated to the property takes on markedly residual properties expanding the risks involved and the gap between the objective functions of the lenders and the borrowers of funds. This can only accentuate the lack of resources available for the financing of fixed assets in enterprises.

Indeed, it seems that the funds made available for credit can ensure greater consistency of payment of the agreed compensation and some

liquidity for the reimbursement of the capital borrowed at a definite date, if the coordination of the operational management are shown equilibrated in their economic and monetary aspect.

It is possible then, to record the development of financial policies that consider the capital resources limited and costly: for the contained capital available, willing to take the bond of the propriety and the expected increase of income by shareholders, because of the perception of risk growing in connection with the accentuated variability of the value remaining after the payment allocated to debt capital.

Indeed, this might be for those companies listed on the official markets and with capital of which is owned mainly in the form of shares by investors who are sensitive to the returns achieved and expected, rather than more directly affected by the fortunes of the company and its development capabilities in the medium-long term.

Small and medium sized enterprises, excluding cases of private equity transactions, generally with the returns achieved from capital ownership (in terms of ROE) are not always made known in line with the expectations of shareholders-owners; however, the latter do not desist themselves from supporting the fate of the company verso more satisfying economic goals. Notice that two management characteristics, more and more frequently, play an unfavourable role:

- the significant incidence of debt in finance structure mainly short-terms banking environment, characterized by variable compensation costs in time and very close (if not higher) to the levels of ROI (Return on Investment);
- the insufficient supply of fixed capital and then of technological input with negative repercussions on conditions of productivity and on the profitability of ongoing operations (ROI).

Generally lacking a sufficient supply of capital property, SMEs make heavy use of self-financing penalizing the profitable aspect of stock-investment, since the latter lacks of substantial liquidity conditions (no listing and absence of dividends).

It is clear that in these circumstances the possibility of a recourse of leverage equity, by placing shares with third parties with respect to the traditional ownership structure, becomes more and more remote.

In a correct company dynamic, in the economic and financial aspects, it is good if there is a measure of income satisfying the capital 's investors

beyond the interest of involvement in the management of the company (promiscuity of the property- management role) and after having paid the agreed remuneration to capital as credit. It is clear that this concept of income is subjective and not always immediately quantified, but it is also true that the industry sector studies and other market surveys attempt to estimate with sufficient approximation to the truth the risk of companies ( by sector) and the average remunerations requested and expected by shareholders (in terms of ROE).

In this regard , the traditional Doctrine refers to the notion of profit as a different meaning from amount “income in formation ” (periodic): in the sense that the profit is intended as a remuneration to business risk (in its broad sense). It follows that only a portion of net income represents the profit in the strict sense: that will be specifically, **Net Income for the Period – Notional Cost of Capital Property = Profit.**

The figurative remuneration of the equity may be related to risk-free rate for long-term investment: the ten years TB ( in our case); and it seems reasonable if we want to report the specific business risk, far beyond the risk-free rate, to a portion of the nominal income.

Then, it can be

$$\mathbf{NI - RFR = NP}$$

*NI= Net Income;*

*RFR= Risk-Free Rate on capital ownership;*

*NP = Normal Profit (remuneration for business risk).*

The measure of NP assumes, as we had already said, a subjective configuration but does not seem far-off a concrete possibility for an estimate.

If the company focuses on the perception of sane financial policy it will not be distracted from the objective of achieving a reasonable Normal Profit, after having appropriately remunerated other factors of production. Achieving this target gives greater autonomy to the development policies of the company that can rely on a wider range of financial solutions, including the leveraged equity (propriety). Even more beneficial is the case of the evidence of Extra Profit (EP): in the sense that can be

$$\mathbf{NI - RFR - NP = EP,}$$

assuming the possibility to make a reasonable estimate of the Normal Profit, or the profitability judged satisfying by shareholders.

In such circumstances, the solutions for adequate financing for development are amplified, giving rise to a situation favourable to

the operations of PE (Private Equity), or listing on the official markets (Public Placement) ; in the case of listed companies, the effects would be those of a significant increase in stock prices. Are evident, then, the highest probability of success of leveraged equity for external support, if the ownership structure and corporate governance so permit.

#### 4. The Leverage effect

The traditional Doctrine has shown that the use of debt in financing the development of production may induce a leverage effect on business profitability (Modigliani, Miller 1958):

$$[1] \text{ ROE} = \text{ROI} + (\text{ROI} - r) \cdot D/E$$

*ROE* = Return on Equity;

*ROI* = Return on Investment (*GoP/Ci*);

*r* = Average rate of Debt Burden;

*D* = total Debt;

*E* = Equity

*GoP* = Gross operating Profit;

*Ci* = Net Capital Invested (Assets).

If the return on investment exceeds the cost of debt ( $\text{ROI} - r > 0$ ), the augmentation of the productions financed by borrowed capital determines growth of income per unit (ROE), *ceteris paribus*; the basic assumption underlying the model is that of a consistent ROI to the changing structure of the liabilities, or that the value in formation is not related to the quality of the financial structure. This assumption requires the presence of financial markets close to the real condition of competitiveness, which of course is not found in today's scenario. If so, the company could make their own funding structure based on its force of attraction of capital (rating), drawing on the funds in the quantities needed, with deadlines for reimbursement chosen (related to the time of realization of investments) and at costs wanted, i.e. lower than the expected income from management operations. The limit increase of the debt would then be referred to the growth of financial risk resulting from the increased leverage, with effects on the level of profitability

rated satisfactory (NP). The tax benefit related to the deductibility of financial expenses (synthesized in “r”), would have an amplified effect on the leverage: in fact the previous [1] would become

$$[2] \text{ ROE} = \text{ROI} + [\text{ROI} - r \cdot (1 - \text{Tr})] \cdot \text{D/E}$$

*Tr = Tax rate on business income.*

In this case, the use of leverage capital can have an effect of gearing down on unit profitability (ROE), thus opposing the presence of inequality ( $\text{ROI} - r > 0$ ) to different solutions by the use of debt, *ceteris paribus*.

In fact, more than few companies can be found in a condition in which the effect of financial leverage does not exhibit its effects in the usual way: this is the case of a substantial difficulty to stock up enough allocations of fixed asset (mortgage -bonds-shares) in relation to sensitive market imperfections, due to a modest size of the direct channel and, in another way, to the dominance of the banks in the indirect one. It is known, indeed, that the granting of long-term bank loans is based on the release of adequate collateral assets that often go beyond the availability of the owners of the companies, limiting not slightly the financial ability; for the same reason scarce cases of purchasing bonds of companies are handled by banks. On the other hand, as already mentioned, it seems unusual the recourse to a leveraged equity beyond the traditional ownership structure if the company is not listed on an official list even in those cases with an adequate consistency of Normal Profit (NP).

Thus, prevailing the short-term debt and limiting the total allocation of capital, the capital structure invested will suffer for the lack of technical input but also for the lack of investment for research and innovation. The Effects on the measurement of the profitability of ongoing operations (ROI) are inevitable, in general signalling a decrease in ROI compared to the best competition. In such cases, it may be that the use of debt to finance the development registers a leverage effect on ROE, if  $\text{ROI} - r > 0$ ; but it is not however, the opposite, in case of increase in equity: in this case, the increased capitalization of fixed capital can support the appropriate entry in the process of innovating technology, with reflections on the productivity and profitability per unit of output (ROI), the deleveraging resulting from the reduction in

the ratio D/E could be compensated by an increase in the difference (ROI-r). Then, the alternative between the increasing short-term debt or the increase of capital property should be carefully investigated by measuring the effects in the structure of liabilities on the quality of capital invested. This problem may not arise when the use of leverage happens with an increase in consolidated debt (mortgage-bonds): the multiplicative effect of the ROE would be stronger if it determines a decrease of the average burden of debt capital (r) and the simultaneous growth of the ROI, with widening of the difference ROI- r, in relation to the lowest cost attributable to this category of investment.

The following tables offer a numerical representation of the effect of deleverage on the ROE, resulting in an increase in property.

**Table 1. Deleverage Values - ROE**

	ROI	r	TR	Capital Ratio	D/E	ROE
Time $t_0$	0,12	0,08	0,43	0,30	2,33	0,22624
Time $t_1$	0,12	0,08	0,43	0,50	1,00	0,19440
Time $t_2$	0,12	0,08	0,43	0,70	0,42	0,15184

Source: our elaborations

Without all the other conditions, the reduction in leverage (D/E) significantly reduces the profitability of capital, this situation is clearly opposed to a policy of company's recapitalization. Diverse are the circumstances, in case of changes in the financial structure if the increase of capital generates an increase of ROI, or a return on investments. In table 2 there are the visible effects of this situation.

**Table 2. Deleverage Values - ROE [K (constant)]**

	ROI	r	TR	Capital Ratio	D/E	ROE
Time $t_0$	0,1200	0,08	0,43	0,30	2,33	0,22624
Time $t_1$	0,1359	0,08	0,43	0,50	1,00	0,22624
Time $t_2$	0,1721	0,08	0,43	0,70	0,42	0,22624

Source: our elaborations

From observing the data, it appears how much an increase of the ROI is required for any expansion of the capital ratio, if you want to keep a constant return on equity (ROE). Therefore, the effects of

investment policy on the process of value formation should be carefully investigated, before reaching conclusions about the financial policies to be used to support the development.

Tables 3 and 4 show the effects of leverage on the decrease in the cost of debt capital ( $r$ ).

**Table 3. Deleverage Values - ROE**

	ROI	$r$	TR	Capital Ratio	D/E	ROE
Time $t_0$	0,1200	0,08	0,43	0,30	2,33	0,22624
Time $t_1$	0,1359	0,08	0,43	0,50	1,00	0,22624
Time $t_2$	0,1721	0,08	0,43	0,70	0,42	0,22624

Source: our elaborations

**Table 4. Deleverage Values - ROE**

	ROI	$r$	TR	Capital Ratio	D/E	ROE
Time $t_0$	0,12	0,08	0,43	0,30	2,33	0,22624
Time $t_1$	0,12	0,07	0,43	0,40	1,50	0,24010
Time $t_2$	0,12	0,06	0,43	0,45	1,22	0,22460
Time $t_3$	0,12	0,05	0,43	0,50	1,00	0,21150

Source: our elaborations

It is obvious that a reduction in the rate " $r$ " means a substantial constancy of the ROE in the presence of an increase in equity (deleveraging), up to the value of leverage D/E not less than 1. And if that were to be confirmed, it would demonstrate the importance of the effects of limiting the level of market interest rates on the quality of the financial structure companies: rates of lower borrowing costs encourage the use of leverage capital, since the profitability expected by shareholders is not penalized. So, on the other way, it re-confirms the critical issues for the country industrial economy, of some parameters such as:

- the content of monetary policy;
- the efficiency of financial markets, in terms of pricing and transaction costs;
- the efficiency of bank intermediation, in terms of reducing the gap between the average of lending and deposit rates.

It is clear that the size of the company can reflect on the leverage and the forming process of income: in the sense that the biggest ones generally present a stronger ability to attract capital, even more if listed. In such circumstances, the banks are more willing to grant multi-year investment, not necessarily accompanied by collateral assets, as well as to negotiate lower interest rates (top rate). And this in fact, most of the time contribute to accentuate the imperfections in financial markets since the financial "privilege" of the great industry is not always accompanied by an actual rating class in regards to the SMEs, but rather being the result of a different bargaining power and attitudes of pre-judgment by the banks.

The fact remains that, in these conditions, the use of leverage produces the expected effects on profitability, i.e. increase of the former, if the assumption used is  $ROI-r > 0$ ; the contrary, in the case of use of capital leverage, since the greater autonomy in the stockpiling of capital generates an advantage for shareholders to have the alternative between bonds and stocks, preferring the first ones, *ceteris paribus*.

For the SMEs, however, the debt-equity option not always present the same resolute profile, since the deficiency of the permanent capital leads to the hypothesis of an increase in equity as a basis for an adjustment technology input and innovation, with reflections on the measurement of ROI and therefore the profitability for shareholders. For this reason worthy companies, because characterized by high rates of development and substantial Extra Profit, may well move towards a solution of Private Equity, if a conservative ownership structure (family) and an inappropriate governance model do not counteract.

## 5. Leverage in Commercial Banks

The analysis conducted so far can be related to commercial banks, to verify in a first approximation the presence of a leverage effect on the profitability of the shareholders, as a result of the use of debt in financing development.

Indeed, it must be pointed out that banking productions are strongly atypical because the essential aspect of their processes is to provide the means of payment accepted by the public as a convenient currency for transactions. This involves overcoming the

financial constraint that characterizes the life of every company, the banks could lend without being preceded by the formation of deposits; but by determining the presupposition that the use of bank money increase through granting overdraft in checking account, so that the augmentation of checks circulation incite the multiplication of deposits. So the process of autogenesis of credit is the engine of development of banking, if there is an availability of cash needed to meet the liquidity requirements of the public and if the equity shows capacity of supervising the risks involved.

Become apparent that what was said in this category of companies, the structure of the liability influences the assets and the process of generation of income, since the impact of deposits is reflected in the liquidity conditions of the loans, while the degree of capital ratio is reflected on their risk. Consequently, the first natural conclusion is that the process of the formation of the value is not indifferent to the content of financial policies. In any case, it is widely considered that commercial banks operate in the effect of leverage, as also traditionally presented by the Doctrine; this can be shared if one considers the fact of a gap between average lending and deposit rates wide enough to ensure a fair remuneration to the factors of production: and so it is, in the norm of today's market scenario characterized by sensitive imperfections that allow intermediaries to transfer on pricing, significant internal inefficiencies. Then, the development of volumes through the autogenesis process of credit will not only mark an expansion of income, because compared to a consistency of assets substantially unchanged, it will highlight an increase in ROE. But from this we believe that we cannot necessarily speculate on the opposite: that an increase of capital property determines a reduction of shareholders' profitability (ROE).

Indeed, a significant majority of its resources (shares) may induce a series of effects on the quality of the financial structure of the bank and then on the process of the formation of the value, mainly for the following circumstances:

- a modified composition of assets increasing the weight of the highly risky , but, for those carrying , more substantial - profits (typically loans to enterprises);
- a stimulus to the process of autogenesis of credit, with growth

in volumes up to a level that marks a new balance between risks assumed and net property'.

It could derive from this a substantial change in the profitability of assets in the portfolio that, if increased, will measure an increment of ROI up to balance the deleverage on the ROE determined by the lower ratio (D/E) of equations [1] and [2].

These summary statements are entirely intuitive but plausible, they deserve a serious study through a scientific analysis to certify their validity. In any case, it seems clear that it does not agree entirely with an approach to banking thematic which consider an obstacle to achieve higher levels of capital the effect of deleveraging from ROE (Return on Equity), compared to the development through the process of multiplication of deposits.

## 6. Conclusion

Financing the productions of enterprise requires two essential conditions:

- the project's capacity to generate value and, therefore, cash flows for the fair remuneration and reimbursement of funds granted;
- an efficient financial system that knows how to transfer the resources available in the savings centre to those of investment or expense more deserving, since there is a strong separation between formation of surplus and their financial utilization.

Except that the holders of capital normally appear to have a strong aversion to risk, as opposed to investors, since the formation of financial structures with significant presence of debt, because financing, with instruments of the credit; assumes the payment of compensation and reimbursement of capital on a definite date, if the company productions are held in conditions of monetary equilibrium and income; on the other hand, it can result a modest consistency of the direct channel of intermediation (securities market) with the emphasis on the centrality of that credit, primarily banks, because of the public's preference for the liabilities instruments issued by banks, as judged low risk and high liquidity.

Part of the Doctrine claimed that in the enterprise prevails a business approach towards the independence of their governance (such as

governance of conservative type), consequently a preference to use self-financing<sup>1</sup>; which, however, in these more and more frequent cases does not show to be capable of ensuring an adequate development of the investments and, therefore, of the volumes of production, therefore using bank loans considered less “binding” and “invasive” for the company<sup>2</sup>. However, this usually involves a lack of fixed capital since short term loans predominate in bank credit; the effects on the financial structure may be such as to affect the process of value formation, since it reflects the input technology, as well as the level of productivity and economy. Otherwise, is the case of larger grades of capitalization with effects on the ROI that could reach higher levels than those of the competition.

These circumstances lay the foundations for a rethinking of assumptions of the traditional Doctrine that affirms the existence of a leverage effect on income for shareholders’ equity (ROE) as a result of the use of debt in financing for development, if  $ROI - r > 0$ ; the result is the formation of financial structures with a predominance of financial capital credit. Except that it may lead to increased profitability unit of the equity in the presence of deleveraging, the decrease in the ratio D/E, where the changes in the pattern of investment (assets) involve an expansion of the ROI. This leads to rethink the function of capital property as a strategic variable able to influence the dynamics of value formation. In commercial banks the importance of the analysis briefly conducted is accentuated, for the importance of their stability in the entire economy, heavily dependent on the ability to confront the risks taken, mainly through the net property (capital goods). In this regard, it is widely widespread that in the process of bank income formation occurs financial leverage: and this is intuitive and plausible, since imperfect markets allow gaps between the rates negotiated profit generators (nominally) even for the less efficient intermediaries.

But there is also no doubt that an increase in wealth can affect the

<sup>1</sup> According to an interpretive model called the “Pecking Order Theory”, the management of the company would tend to favour the exploitation of domestic sources of financing for development. There are the business conditions that makes possible the implementation of this approach: high rates of profits and content levels of increased investment in fixed capital. See, Forestieri (2001).

<sup>2</sup> The theoretical approach “Trade-off” focuses on convenience to use debt financing for development: the optimal leverage maximizes the value as a “balanced” result of the positive (including the tax interest expense exemption) and negative effects (the higher financial risk and instability) produced by the increase in debt. See, Be Duc, Bondt, Calza, Marquez, Van Rixtal, Scopel (2005).

structure of assets and therefore on the interest margin; and if so, it could measure an increase in the profitability of ongoing operations (ROI) with compensation of the deleveraging effect (D/E). So, even in banks, it has to be reaffirmed the importance of a financial strategy that assigns to equity a role not only stabilizing for the development and risk management, but also to stimulate expansion and profitability and eventually the remuneration assigned to shareholders.

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Printed in December 2011  
by Litografia Brandolini - Sambuceto  
for Edizioni TRACCE  
Via Eugenia Ravasco, 54  
65123 PESCARA  
Tel. +39 085/76658  
[www.tracce.org](http://www.tracce.org)

In the latest centuries, generally speaking, history records the alternation of some important seasons which lend themselves to represent economic models, which are the bases of modern economic thought.

First of all, there is the age of *colonial economy* centered on the role of imperial states, together with the birth of monopolistic companies, in the management of trades with dominion areas.

Then, the age of *international economy* was lived, culminating in the second post war trade relation system. It was mainly founded on the functions of the national states and their authorities to support both national expansionary fiscal policy and exchange clearings, in their trade ratios with the rest of the world.

At last, in the latest years, *interglobal economy* took vehemently the lead through the modern electronic infrastructures of telematic and telecommunications.

As the former models, the *interglobal economy* too does not automatically assure either stable equilibrium or the overcoming of traditional crises.

It gives benefits and disadvantages too.

From the normative and positive points of view, one of the disadvantages which most drew the attention of researchers is the weakening and disappearance of national and subnational economic and monetary policy instruments.

Instead one of the benefits which most attracted interest might be located on the nature itself of the technological revolution in progress, foreboding new opportunities in the integration process of local economic systems, which might qualify themselves as network growth links (or growth poles?).

The Review has the aim to represent and to inquire the normative and positive profiles of the fundamentals which might characterize the thin and difficult frontier between globalization and economic localism.



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Euro 12,91

ISSN 1722-424 1  
  
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