Notas

THE TRADE UNION CYCLE

PHILIPP BAGUS*

I
THE POWER OF UNIONS OVER THE BUSINESS CYCLE

The current economic crisis has shaken the positions of labour unions within the EU. The underlying trend of globalization that also weakens Western trade unions was reinforced by the recession.

The power of trade unions typically tends to grow during economic booms and to fall during economic recessions. In order to explain this trend we first have to understand the phenomenon of the business cycle.[1] Artificial booms are triggered by the credit expansion of the banking system. Artificially low interest rates induce entrepreneurs to start more and longer investment projects than cannot be sustained by the available amount of real savings. There is a distortion between the behaviour of savers and that of investors. Entrepreneurs start more projects than savers are willing to sustain. Particularly, capital-intensive sectors are expanded during the boom due to the artificially low interest rates.

Resources are shifted into these expanding sectors. At some point it becomes obvious that the boom is only financed by newly created money and is not sustained by real savings. The erroneously started investment projects have to be liquidated or restructured. Factors of production have to be shifted into the sectors where consumers really want them.

In the recent cycle there was an overexpansion of highly capital-intensive sectors such as the construction sector and the automotive sector that attracted factors of production including

* Ph. D. in Economics and Associate Professor in Economics at the King Juan Carlos University.

[1] For an encompassing treatment of the causes and consequences of business cycles see Huerta de Soto, J. (2009): *Money, Bank Credit, and Economic Cycles*, Mises Institute, Auburn, Ala.

Procesos de Mercado: Revista Europea de Economía Política
Vol. VIII, n.º 1, Primavera 2011, pp. 255 a 273

workers. Workers are employed in jobs that produce goods that consumers do not want as urgently as other goods. Thus, the workers must be transferred into sectors that are in line with consumer preferences for the economy to recover.

In order to achieve this, it is of the utmost importance for factor markets to be flexible. If factor markets are not flexible, factors of production such as labour will remain unemployed. Thereby, consumption is reduced, harming other companies that have to reduce costs and release workers, making the recession longer and harder than necessary.

What does all this imply for the power or influence of trade unions over the cycle?

There is a union power cycle over the course of the business cycle. During the boom the credit expansion ultimately raises prices and wage rates. Workers are attracted into the booming capital-intensive sectors by higher wages. In such circumstances trade unions may sell themselves as defenders of workers' interests and demand higher wages in all industries without being too disruptive. Indeed, wages will be bidden up due to the increasing money supply. Labour unions may seize the opportunity and portray them as the «cause» of wage increases even though the wages had increased without them.

The environment for trade unions changes dramatically during a downturn of the business cycle. During the boom workers are shifted into sectors where they should not be. In the recession they are set free. Workers try to find jobs in sectors where consumer preferences demand them to be at wage rates that make their employment profitable. For a fast recovery it is therefore essential for labour markets to be as flexible as possible.

Trade unions make labour markets more inflexible and raise the cost of labour, thereby disturbing the vital adaption of the structure of production during recessions. The public tends to understand that trade unions act as a disturbance during recession times.

Moreover, due to inflexible labour markets, unemployment increases. At all times, when unemployment increases, the position of trade unions is threatened as they lose members and are attacked by public opinion. People tend to grasp that unions make it more difficult for the unemployed to find new jobs as their policies make

labour markets more inflexible. As unemployment increases pressure rises on trade unions to be less dogmatic and allow for some flexibility to enable unemployment to be reduced.[2] What are needed are new jobs and flexibility and not labour unions demanding labour protection or hurting companies by strikes.

There are therefore three main factors that put pressure on unions during recessions:

— They are regarded as an obstacle to the readjustment of the economy.
— They are regarded as the cause of prolonged unemployment.
— They lose members due to the increase in unemployment.

We will now take a look at different countries of the European Union to illustrate and support our theoretical findings.

1. German unions during the recent crisis

During the crisis the German Union Federation (DGB) as well as other unions proved to be very cooperative. In fact, German unions were accused by the extreme left of cooperating with the class enemy.[3]

Unionists invited chancellor Merkel to the traditional first of May meeting of 2009 and even praised employers for their successful cooperation. They unconvincingly threatened to protest if there were massive job losses.[4]

---

[2] See Riexinger, B. and Sauerborn, W. (2009): «Weiter so – oder Krise als Chance?» Diskussionsbeitrag des AK Weltwirtschaftskrise ver.di Baden-Würtemberg, accessed at http://www.gew-hb.de/Binaries/Binary9852/Gewerkschaften-Weltwirtschaftskrise.pdf on 10 October 2010, for the claim that approval rates for German unions increased during the crisis. This increase was caused by their cooperative behaviour.

[3] Henning, D. (2010): «German Trade Union Congress Closes Ranks with Government and Employers», World Socialist Web Site, accessed at http://www.wsws.org/articles/2010/may2010/germ-m22.shtml on 10 October 2010 or Rucht, D. (2009): «Ruhe ohne Sturm», Taz.de, accessed at http://www.taz.de/1/debatte/kommentar/artikel/1/ruhe-ohne-sturm/ on 10 October 2010.

[4] Die Zeit (2009): «Die Gewerkschaften sind zurück», accessed at http://www.zeit.de/2009/19/Gewerkschaften on 10 October 2010.

At the same time, union membership has kept falling as it has done for two decades. The situation is severe as unions are failing to attract new members among the young workers. Due to globalization they have been paralysed in the face of job losses, a reduction in social security, part-time work etc. German unions themselves acknowledge their predicament.[5]

During the crisis there was indeed no alternative to a pragmatic stand despite their obligatory interventionist rhetoric. If German unions had proved to be more inflexible, they might have completely lost their already-fading support in the population. Moreover, it was in their interest to cooperate and extend part-time work in many companies, thereby preventing unemployment. Unemployment would have accelerated their loss of members.[6]

The cooperative stand during the crisis led to an increased trust of the public in the unions. German unions tried to capitalize on their earned political capital during the recovery and demand higher wages.[7] The German economic recovery is occurring faster than in other European countries because German unions reacted prudently, the government did not interfere too much with the restructuring of the economy by employing Keynesian measures, and the distortions had been less than in other European countries in the first place. Therefore, German unions will be better off relative to their fellows in countries where the crisis continues to put pressure on labour markets and unions.

---

[5] Riexinger, B. and Sauerborn, W. (2009): «Weiter so – oder Krise als Chance?», ver.di.

[6] Wisdorff, F. (2009): «Warum die Krise den Gewerkschaften nicht hilft», *Die Welt*, accessed at http://www.welt.de/wirtschaft/article3708896/Warum-die-Krise-den-Gewerkschaften-nicht-hilft.html on 10 October 2010.

[7] DPA (2010): «Gewerkschaften fordern nach der Krise höhere Löhne», *Handelsblatt*, accessed at http://www.handelsblatt.com/newsticker/unternehmen/gewerkschaften-fordern-nach-der-krise-hoehere-loehne; 2644517 on 10 October 2010.

2. Spanish unions during the recent crisis

Spanish trade unions are in a slightly different position from German ones. Traditionally, they have more power than German unions. They are more leftist and faced with a socialist government that has close ties to them.

Spanish trade unions were quite calm during the crisis. They were even accused by the extreme left of disappearing, and of being associated with the government.[8]

There are several reasons for this behaviour beside their close political ties to the government. Spanish trade unions lost members massively during the crisis and had to become more pragmatic, even though, in their rhetoric, they opposed the austerity measures.[9]

In addition, the rise in unemployment put trade unions on the defensive. Spanish unemployment rose more than that of other EU states. An inflexible labour market and unions were made responsible for the surge in unemployment by public opinion, which rose against trade unions. The public wanted unions to cooperate and not pose obstacles to the recovery. Fewer people showed up at union protests.

Another reason for the calmness of Spanish unions was an increase in their subsidies during the crisis.[10] Thus, only hesitantly and half-heartedly did Spanish unions organize a general strike on 29 September 2010 against austerity measures and a labour market reform.

The strike might well be considered a fake strike. The unions knew they would not change the government's decisions. The

---

[8] Publico (2008): «Qué papel juegan los sindicatos en la crisis?», accessed at http://www.publico.es/dinero/178995/-que-papel-juegan-los-sindicatos-en-la-crisis on 10 October 2010. See also López M. (2010): «Los sindicatos en crisis: "Corren malos tiempos, compañeros"», Elconfidencial.com, accessed at http://www.elconfidencial.com/espana/sindicatos-crisis-corren-malos-tiempos-companeros-20100619-66657.html on 10 October 2010.

[9] GEES (2009): «Los sindicatos y la crisis», Libertaddigital.com, accessed at http://www.libertaddigital.com/opinion/gees/los-sindicatos-y-la-crisis-47593/ on 10 October 2010.

[10] Cuesta, C. and Mazo, E.S. (2009): «Zapatero mima los sindicatos en plena crisis económica», Expansion.com, accessed at http://www.expansion.com/2009/04/23/economia-politica/1240522196.html on 10 October 2010.

reform of the labour market did not introduce any important changes. The «reform» seems to be more important than it is through the union's protest.

The general strike was sometimes considered a strike against the opposition. The government, indeed, had an interest that the strike would not be a total failure. The Spanish government had to show to markets that they really had made some reforms that hurt.[11] A general strike would show that they really had done their homework, even though in reality this was not the case.

Participation in the strike was weak and the media considered it a failure on a day when unions had called for strikes throughout the European Union.[12] Why would one not go to work, if one fears for one's job and an increasing number of people are out of work? A dubious result of the strike was that union subsidies were maintained.

Because of the Keynesian policies of the government and the inflexible labour market the Spanish economy will take more time to recover. Consequently, the pressure on the Spanish trade unions will continue.

3. French and Italian unions during the recent crisis

In France and Italy, there was no general and strong rise of organized labour. Indeed, during the crisis unions did not have much leverage. When factories are closed anyway, the threat of striking and halting work is not worth much.[13] In Italy unions were accused by the extreme left of organizing fake protests and strikes. During

---

[11] Mallet, V. and Pignal, S. (2010): «Unions Across Europe Protest Over Cuts», *Financial Times*, accessed at http://www.ft.com/cms/s/0/98a76e72-cb9b-11df-a4f5-00144feab49a.html on 10 October 2010.

[12] De la Varga, J. (2010): «La huelga general en la prensa: "fracaso general", "impacto moderado", "coacción" y "violencia" los referentes», Forum Libertas.com, accessed at http://www.forumlibertas.com/frontend/forumlibertas/noticia.php?id_noticia=18055&id_seccion=6 on 10 October 2010.

[13] Bennhold, K. (2008): «French Unions Losing Influence in Downturn», *New York Times*, accessed at http://www.nytimes.com/2008/12/26/business/worldbusiness/26union.html?_r=2 on 10 October 2010.

the worst time of the crisis unions and employers actually worked together in attempts to secure help from the government.[14]

Fiat is an interesting case that demonstrates once again the weakness of trade unions during recessions in a globalized world. Fiat promised to invest in its Italian plants and create jobs in exchange for a change in work rules, namely reduced sick leave and no strikes after agreements.[15] In the recovery from a severe crisis, the position of trade unions continues to be weak. Employers want to increase production and can do so in several locations at home and abroad. Thereby, they can gain concessions from trade unions.

4. Irish and Greek unions during the recent crisis

In Ireland and Greece unions were also accused by the extreme left of collaborating with the governments and employers.[16] Unions were seen as an industrial police force helping to impose austerity measures.

In Ireland, unions had a long tradition of being pragmatic, in favour of tax cuts, reducing strikes and thereby attracting foreign capital. During the financial crisis, Irish unions continued to be responsible and even called off a strike, sending a signal that unions would not be an obstacle to austerity measures. Without austerity measures both Greece and Ireland most probably would have had to default on their debt and opposing unions would have had to share the blame.

---

[14] Colin, M. (2009): «Italian Government Granting Fiat, Union Assistance in 10 Days», *The Car Connection*, accessed at http://www.thecarconnection.com/marty-blog/1018181_italian-government-granting-fiat-unions-assistance-in-10-days on 10 October 2010.

[15] Forden, S.G. (2010): «Fiat Tests Union Strength in Shift to Worst Plant», *Bloomberg*, accessed at http://noir.bloomberg.com/apps/news?pid=newsarchive&sid=aiLTCDnOFkqk on 10 October 2010.

[16] James, S. (2010): «Irish Unions Seek New Partnership with Government-Employers Against Working Class», World Socialist Web Site, accessed at http://www.wsws.org/articles/2010/mar2010/irel-m06.shtml on 10 October 2010. Salzmann, M. and Stevens, R. (2010): «The Greek Trade Unions: Partners in the Government's Austerity Program», World Socialist Web Site, accessed at http://www.wsws.org/articles/2010/feb2010/gree-f27.shtml on 10 October 2010.

In Greece, the socialist government faced bankruptcy and introduced severe austerity measures. Union leaders publicly acknowledged that Greece was facing severe problems. Unions limited themselves to calling for sporadic strikes to demonstrate their indignation about the situation to appease frustrated workers. However, they were not fundamentally opposed and even said that they were willing to accept tough measures if they were just.

The accusations from the left do not take into account that unions in a severe recession in a globalized world have no alternative than to be cooperative. With rising unemployment they lose members and cannot pressure strongly multinational companies that can just switch their production abroad.

In sum, European unions have reluctantly accepted the anti-crisis measures of European governments. In a time of rising unemployment they were seen as obstacles to the recovery; they basically had no other choice. Their ideology is not changing, at least not their basic leftist rhetoric. However, their strategies are becoming more adapted to their weaker position, i.e. they are becoming more cooperative. Slowly their ideology may also be moving towards a more moderate position.

II
INTERACTIONS BETWEEN TRADE UNIONS IN THE EU WITH UNIONS FROM «EMERGING ECONOMIES»

1. Contradictions in union ideology

A long-term factor undermining the power base of trade unions in the EU is globalization. Long before the crisis there was an important loss in power for European trade unions. Emerging economies have been opening their economies and introducing free market reforms. The economic growth in these countries has been astonishing and is continuing to be so.

Manufacturing jobs have been transferred from Western nations to emerging countries. Thus, the positions of Western trade unions toward emerging countries have often been hostile,

revealing a contradiction in union ideology and workers' interests.[17]

Union ideology is based on the Marxian class theory, which identifies an irreconcilable conflict of interest between the working class and the capitalist class (employers). Supposedly members of the working class and members of the capitalist class each share the same interests while the interests of the two classes are opposed.

In reality, there are opposing interests within each «class». Businessmen compete with each other. They also compete to obtain the best workers at the best prices. At the same time, workers compete with each other to acquire the best jobs at the best companies.

In addition, workers and businessmen both share the interest that their companies flourish. Thus, the conflict of interest on which trade union ideology is based is artificial. Workers compete with each other and compete especially with the unemployed. One traditional strategy of trade unions in this context is to eliminate the competition of «unqualified workers» by imposing minimum wage laws.

The same competition between workers also occurs on an international level. Yet, unsurprisingly, Western trade unions have so far failed to impose minimum wage laws to remove the competition of cheap labour on the international level.

Emerging countries reveal the contraction in trade union ideology. There is a conflict between workers from different nations. On the international level unions tend to give up their Marxian class analysis. Thus, Western unions regard Chinese workers as competitors and protest against moving factories to emerging countries.

If a «class interest» of workers really existed, Western unions would welcome the shift of factories to emerging countries

---

[17] See for instance, IG Metall (2004): *Offshore? Total Global?*, München. This publication of a German trade union opposes globalization and implicitly the creation of jobs in emerging countries. Similarly, US unions wanted to keep China out of the WTO in order to impede competition and implicitly the rise in living standards of Chinese workers. See Nyhan, P. (1999): «Labor Unions Ready to Fight Hard to Keep China out of WTO», *Seattle Post*, accessed at http://www.seattlepi.com/business/chi09.shtml on 10 October 2010.

because fellow workers could profit from industrialization. Yet, unions just defend the short-term interests of workers with jobs in their country against potential competitors from the inside and from the outside.

2. Globalization and the power of trade unions

Globalization and the rise of emerging economies put pressure on Western wage rates and labour standards, and thereby on trade unions. Trade unions must allow for more flexibility in labour markets and cannot push through exaggerated wage increases as these would cause an immediate transfer of jobs to emerging countries.

Trade unions are thus in a dilemma. Either they have to disappoint their traditional members and allow for more flexibility or they cause massive job losses to emerging countries, causing opposition from the general public and governments. Globalization, thereby, has threatened both the ideological grounding of unions as well as their power.

We will now take a look at trade unions in the emerging markets, where in general union influence has also been declining and is much lower than in Europe.[18]

3. Cooperation with China

China is paradigmatic for the problems of possible cooperation between European unions and emerging market unions. In addition, China is crucial for unions as it is setting the global norm for working standards.[19] With the lowest labour standards, China

[18] Das, S., Kuruvilla, S. , Kwon, H. and Kwon, S. (2002): «Trade Union Growth and Decline in Asia», *ILR Collection, Articles & Chapters*, Cornell University, accessed at http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1216&context=articles on 10 October 2010.

[19] Global Labor Strategies (2008): «Why China Matters: Labor Rights in the Era of Globalization», accessed at http://laborstrategies.blogs.com/global_labor_strategies/files/why_china_matters_gls_report.pdf on 10 October 2010. Working

is the standard of comparison for other countries. If unions in other emerging countries raise wages or labour standards (or if they are not lowered in Western countries), then these countries lose investments to China.

Unionists are beginning to understand that Chinese working conditions are indirectly connected to working conditions in their own country and union power. Thus, they maintain that a common worldwide union interest exists. They push for «human rights» and higher labour standards in China and oppose globalization.[20]

In China there are no free unions. The state union ACFTU (All China Federation of Trade Unions) is a longer arm of the Government used to ensure «harmonious» relationships between workers and employers. In other words, European unions have to cooperate with the Chinese Government to attain their aims of higher labour standards and wages in China.

As Western unions begin to understand the importance of China for international labour standards there is a change in strategy of trade unions from non-interference to attempts at cooperation.[21] Thus, the German federal union DGB tried to intensify contact with the ACFTU. The International Trade Union Confederation announced in December 2007 the end of its critical opposition and initiated a dialogue.

China cannot be ignored any more as it is a powerful drag on union power and labour standards around the word. Thus, the DGB wants harmonization of labour standards and no «competitive» disadvantages for Germany.

As Anne Sander writes:

> The adjustment of labour standards worldwide is presented as an instrument to both preserve German jobs and fight for social

---

or labour standards are interpreted in this article as all the privileges trade unions have obtained, the regulations that make labour markets inflexible and government subsidies interfering with a free labour market.

[20] IG Metall (2004): *Offshore? Total Global*?, München.

[21] Sander, A. (2009): «German Trade Unions and China: From Non-Interference to Cooperation?», Hintergrundinformationen, EU-China Civil Society Forum, accessed at http://www.eu-china.net/web/cms/upload/pdf/materialien/eu-china_2009_hintergrund_09.pdf on 10 October 2010.

> justice in developing economies. Following this approach, the IG Metall [German union] has focussed on implementing minimum standards and tried to establish trade union cooperation.[22]

However, one has to understand that the competitive German disadvantage is a competitive advantage from the point of view of the Chinese Government in control of the ACFTU.

It is not in the interest of the Government to choke economic export-led growth by introducing higher labour standards and giving more power to trade unions. In fact, the Chinese Government has demonstrated for a long time through its exchange rate policy against strong international pressure that it wants export-led growth. Accordingly, it will not risk this growth by raising labour standards.

The Chinese Government needs growth in order to satisfy its workers and allow people to come from the countryside to work in the industrial areas. In this line, the Government has repeatedly stated the importance of free trade. It cannot allow a rise in labour standards to cause unemployment as this would result in social unrest. China's political elite needs continuously rising living standards to contain social unrest. In fact, during the crisis, when some factories were closed, social unrest was a threat.[23]

In addition, local Chinese Governments do not want to scare investors and use their autonomy to compete with low labour standards.[24] Chinese workers want neither problems with their management nor higher labour standards. They only want jobs and see their real wages progress anyway. Many understand

---

[22] Sander, A. (2009): «German Trade Unions and China: From Non-Interference to Cooperation?», EU-China Civil Society Forum, pp. 5-6.

[23] Wong, S. (2008): «Impacts of the Financial Crisis on Labour Conditions in China», *Werkstatt Ökonomie*, accessed at http://www.eu-china.net/web/cms/upload/pdf/materialien/wong_2008_impacts_of_the_financial_crisis.pdf on 10 October 2010.

[24] Grassi, S. (2008): «Die neuen Aufgaben der chinesischen Gewerkschaften», *China Aktuell* 1/2008, accessed at http://www.ak-rlp-fujian.de/08-01-grassi-fokus-gewerkschaft.pdf on 10 October 2010 Recently, the government has been less hard on strikers. See The Economist (2010): «The Rising Power of the Chinese Worker», accessed at http://www.economist.com/node/16693333 on 10 October 2010.

that higher labour standards would threaten their jobs and only benefit unions in industrial countries.[25]

The logic of competition in a globalized world, thus, ensures that labour standards remain low in emerging economies. Moreover, the movement of Chinese labour from the countryside to the cities maintains downward pressure on wages.

Obstacles to cooperation with Chinese unions:

— it is not in the interest of Chinese workers
— it is not in the interest of the Chinese Government (local and central)
— European unions have been hesitant to cooperate with a state union.

4. Cooperation with other emerging economies

In other emerging economies the situation is similar. Unions have lost members and influence in emerging economies such as the Philippines, India, Thailand, Vietnam and Brazil.[26] The story is basically the same as in China.

European trade unions understand that the competition from emerging countries poses a threat to their power.[27] Thus, they want to «cooperate» and harmonize labour standards. Their cooperation efforts mainly concentrate on building networks, participating in campaigns such as «Fair Play» and spreading their socialist ideology.[28] Yet, there is still no coherent and promising strategy.

---

[25] Wisdorff, F. (2007): «Wie die IG Metall Sozialstandards in China prüft», *Die Welt*, accessed at http://www.welt.de/wirtschaft/article915446/Wie_die_IG_Metall_in_China_Sozialstandards_prueft.html on 10 October 2010.

[26] Datt, R. (2008) «Emerging Trends in Trade Union Movement», *Mainstream XLVI*, n.º 20, accessed at http://www.mainstreamweekly.net/article678.html on 10 October 2010.

[27] Greven, T. (2008): *Competition or Cooperation. The Future of Relations Between Unions in Europe and the United States*, Briefing Paper 07/2008, Friedrich Ebert Stiftung.

[28] Friedrich Ebert Stiftung (2010): «Regional Trade Union Program Asia-Pacific», accessed at http://www.fes-asia.org/pages/regional-programs/regional-trade-union-program-asia-pacific.php on 10 October 2010. Institutional cooperation is proving to be difficult. The International Trade Union Confederation is dominated by industrial nations with the exception of Brazil.

Indeed, emerging markets' governments do not want to threaten the benefits that globalization brings to their citizens. By raising labour standards international companies would leave for competing countries. Thus, it is not in the interest of emerging countries' governments and workers to give up their competitive advantage and increase labour standards.

The economic crisis has not changed this trend. After the crisis the global economic situation is still delicate and there is a danger of falling back into the recession. Unions in emerging countries cannot cooperate in the way European unions want them to cooperate. Either they are directly controlled by the government or restrictive labour legislation by governments has taken privileges away from unions. Emerging markets' unions tend to side with the interests of their governments and workers.

III
IMPLICATIONS FOR THE EU AND GLOBAL ECONOMIES

Trade unions will continue to lose influence. The long-term trend of globalization and the competition of workers from emerging countries are undermining the power of Western trade unions. They cannot yield the same influence as before without threatening massive resistance and job losses.

Trade unions are driven by globalization. They have to give in to the flexibilization of labour markets and moderate collective wage settlements. Otherwise, they will speed up their own destruction.

The long-time loss of the influence of trade unions due to globalization has been accelerating recently due to the crisis. In recessions trade unions come under pressure because they represent a main obstacle to a fast recovery and are perceived as such. They oppose reforms of labour markets but increasing unemployment puts them under pressure.

During the present crisis cooperation and the fragile recovery are becoming even more difficult as each country has to deal with unemployment. Emerging countries need export growth and cannot allow for «cooperation». Thereby, the crisis throws back

and slows down cooperation. Everyone has to look to their own interest and survival first.

The only way out of the long-term downward trend for trade unions is globalization of the trade union movement and the institution of an effective worldwide cartel of trade unions. Only in this case would the competitive pressure from emerging markets on Western labour units be remediated. There have been some recent attempts at collaboration initiated by Western unions, yet there have been no strong results.

The problem for trade unions is that their interests are simply too diverse. Applying the same or similar legal labour conditions and minimum wages in emerging economies as in the EU would put emerging market workers out of their jobs. Their productivity is not high enough. They are not equipped with the same capital or education as European workers. Trade unions from emerging countries, therefore, will not cooperate closely with EU trade unions. Their interests are directly opposed. Consequently, the influence and power base of EU trade unions is destined to continue to fall.

In order to stop this trend, unions would have to win the battle of ideas over globalization. All over the world ideas tend to favour the division of labour and free trade, i.e. globalization, because their benefits are obvious and strong.

It is true that free market ideas have been under attack due to the crisis.[29] Yet, the attacks have been aimed more at financial institutions and greedy bankers. The general idea of free trade is still generally accepted. The problems that tariffs caused in the 1930s are still remembered. Maybe the currency wars appearing on the horizon will eventually change the picture. However, up to now, unions have failed to paint an attractive alternative to globalization.

Unions are in search of such an alternative vision.[30] They would have to convince emerging markets' workers not to compete with

---

[29] See Erne, R. (2010): «European Unions after the Crisis», second draft for book chapter – on the prospect of a counter-movement against the marketization of society – for the forthcoming Festschrift for Colin Crouch ed. by L. Burroni, M. Keune and G. Meardi, *Economy and Society in Europe: A Relationship in Crisis*, Edward Elgar, Cheltenham, forthcoming, accessed at http://ucd-ie.academia.edu/documents/0143/7638/Roland_Erne_2010_European_Unions_after_the_Crisis.pdf on 10 October 2010.

[30] See Erne, R. (2010): «European Unions after the Crisis».

European workers and live in autonomy, as before globalization. Yet, after the failure of communism this task is difficult. The picture of central planning is not appealing any more. Autonomy, closed borders and a restriction of trade are not appealing either.

How could autonomy be painted attractively? Maybe the invocation of strong nationalist feelings might help to draw such a vision, but currently ideas broadly condemn nationalistic and especially national socialist dreams of autonomy.

As unions cannot paint autonomy as an appealing vision they will have to stick to the picture and logic of free trade. Once they implicitly accept the benefits of globalization and free trade that are obvious to the general public, unions will have lost the battle of ideas. They will continue in a defensive uphill battle and continue to lose power. Only if they change their ideology and start to defend the real interests of workers by favouring free markets, savings and capital accumulation may they regain importance.

If they do not change their ideology their power will continue to fall. Labour markets will become more flexible and wage accords will be more moderate. As a consequence, the role trade unions play in society will keep falling and unemployment may be reduced. This may help to reduce public deficits and boost economic growth both in Europe and in the emerging markets.

BIBLIOGRAPHICAL REFERENCES

BENNHOLD, K. (2008): «French Unions Losing Influence in Downturn», *New York Times*, accessed at http://www.nytimes.com/2008/12/26/business/worldbusiness/26union.html?_r=2 on 10 October 2010.

COLIN, M. (2009): «Italian Government Granting Fiat, Union Assistance in 10 Days», *The Car Connection*, accessed at http://www.thecarconnection.com/marty-blog/1018181_italian-government-granting-fiat-unions-assistance-in-10-days on 10 October 2010.

CUESTA, C. and MAZO, E.S. (2009): «Zapatero mima los sindicatos en plena crisis económica», Expansion.com, accessed at http://www.expansion.com/2009/04/23/economia-politica/1240522196.html on 10 October 2010.

DAS, S., KURUVILLA, S., KWON, H. and KWON, S. (2002): «Trade Union Growth and Decline in Asia», *ILR Collection, Articles & Chapters*, Cornell University, accessed at http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1216&context=articles on 10 October 2010.

DATT, R. (2008): «Emerging Trends in Trade Union Movement», *Mainstream XLVI*, n.º 20, accessed at http://www.mainstreamweekly. net/article678.html on 10 October 2010.

DE LA VARGA J. (2010): «La huelga general en la prensa: "fracaso general", "impacto moderado", "coacción" y "violencia" los referentes», Forum Libertas.com, accessed at http://www.forumlibertas.com/frontend/forumlibertas/noticia.php?id_noticia=18055&id_seccion=6 on 10 October 2010.

DIE ZEIT (2009): «Die Gewerkschaften sind zurück», accessed at http://www.zeit.de/2009/19/Gewerkschaften on 10 October 2010.

DPA (2010): «Gewerkschaften fordern nach der Krise höhere Löhne», *Handelsblatt*, accessed at http://www.handelsblatt.com/newsticker/unternehmen/gewerkschaften-fordern-nach-der-krise-hoehere-loehne; 2644517 on 10 October 2010.

ERNE R. (2010): «European Unions after the Crisis», second draft for book chapter – on the prospect of a counter-movement against the marketization of society – for the forthcoming Festschrift for Colin Crouch ed. by L. Burroni, M. Keune and G. Meardi, *Economy and Society in Europe: A Relationship in Crisis*, Edward Elgar, Cheltenham, forthcoming, accessed at http://ucd-ie.academia.edu/documents/0143/7638/Roland_Erne__2010___European_Unions_after_the_Crisis.pdf on 10 October 2010.

FORDEN, S.G. (2010): «Fiat Tests Union Strength in Shift to Worst Plant», *Bloomberg*, accessed at http://noir.bloomberg.com/apps/news?pid=newsarchive&sid=aiLTCDnOFkqk on 10 October 2010.

FRIEDRICH EBERT STIFTUNG (2010): «Regional Trade Union Program Asia-Pacific», accessed at http://www.fes-asia.org/pages/regional-programs/regional-trade-union-program-asia-pacific.php on 10 October 2010.

GEES (2009): «Los sindicatos y la crisis», Libertaddigital.com, accessed at http://www.libertaddigital.com/opinion/gees/los-sindicatos-y-la-crisis-47593/ on 10 October 2010.

GLOBAL LABOR STRATEGIES (2008): «Why China Matters: Labor Rights in the Era of Globalization», accessed at http:// laborstrategies.blogs.com/global_labor_strategies/files/why_china_matters_gls_report.pdf on 10 October 2010.

GRASSI, S. (2008): «Die neuen Aufgaben der chinesischen Gewerkschaften», *China Aktuell* 1/2008, accessed at http://www.ak-rlp-fujian.de/08-01-grassi-fokus-gewerkschaft.pdf on 10 October 2010.

GREVEN, T. (2008): *Competition or Cooperation. The Future of Relations Between Unions in Europe and the United States*, Briefing Paper 07/2008, Friedrich Ebert Stiftung.

HENNING, D. (2010): «German Trade Union Congress Closes Ranks with Government and Employers», World Socialist Web Site, accessed at http://www.wsws.org/articles/2010/may2010/germ-m22.shtml on 10 October 2010.

HUERTA DE SOTO, J. (2009): *Money, Bank Credit, and Economic Cycles*, Mises Institute, Auburn, Ala.

IG METALL (2004): *Offshore? Total Global?*, München.

JAMES, S. (2010): «Irish Unions Seek New Partnership with Government-Employers Against Working Class», World Socialist Web Site, accessed at http://www.wsws.org/articles/2010/mar2010/irel-m06.shtml on 10 October 2010.

LÓPEZ, M. (2010): «Los sindicatos en crisis: "Corren malos tiempos, compañeros"», Elconfidencial.com, accessed at http://www.elconfidencial.com/espana/sindicatos-crisis-corren-malos-tiempos-companeros-20100619-66657.html on 10 October 2010.

MALLET, V. and PIGNAL, S. (2010): «Unions Across Europe Protest Over Cuts», *Financial Times*, accessed at http://www.ft.com/cms/s/0/98a76e72-cb9b-11df-a4f5-00144feab49a.html on 10 October 2010.

NYHAN, P. (1999): «Labor Unions Ready to Fight Hard to Keep China out of WTO», *Seattle Post*, accessed at http://www.seattlepi.com/business/chi09.shtml on 10 October 2010.

PUBLICO (2008): «Qué papel juegan los sindicatos en la crisis?», accessed at http://www.publico.es/dinero/178995/-que-papel-juegan-los-sindicatos-en-la-crisis on 10 October 2010.

RIEXINGER, B. and SAUERBORN, W. (2009): «Weiter so – oder Krise als Chance?», Diskussionsbeitrag des AK Weltwirtschaftskrise ver.di Baden-Wuertemberg, accessed at http://www.gew-hb.de/Binaries/Binary9852/Gewerkschaften-Weltwirtschaftskrise.pdf on 10 October 2010.

RUCHT, D. (2009): «Ruhe ohne Sturm», Taz.de, accessed at http://www.taz.de/1/debatte/kommentar/artikel/1/ruhe-ohne-sturm/ on 10 October 2010.

SALZMANN, M. and STEVENS, R. (2010): «The Greek Trade Unions: Partners in the Government's Austerity Program», World Socialist Web Site, accessed at http://www.wsws.org/articles/2010/feb2010/gree-f27.shtml on 10 October 2010.

SANDER, A. (2009): «German Trade Unions and China: From Non-Interference to Cooperation?», Hintergrundinformationen, EU-China Civil Society Forum, accessed at http://www.eu-china.net/web/cms/upload/pdf/materialien/eu-china_2009_hintergrund_09.pdf on 10 October 2010.

WISDORFF, F. (2007): «Wie die IG Metall Sozialstandards in China prüft», *Die Welt*, accessed at http://www.welt.de/wirtschaft/article915446/Wie_die_IG_Metall_in_China_Sozialstandards_prueft.html on 10 October 2010.

— (2009): «Warum die Krise den Gewerkschaften nicht hilft», *Die Welt*, accessed at http://www.welt.de/wirtschaft/article3708896/Warum-die-Krise-den-Gewerkschaften-nicht-hilft.html on 10 October 2010.

WONG, S. (2008): «Impacts of the Financial Crisis on Labour Conditions in China», *Werkstatt Ökonomie*, accessed at http://www.eu-china.net/web/cms/upload/pdf/materialien/wong_2008_impacts_of_the_financial_crisis.pdf on 10 October 2010.

EL PODER DE MERCADO, VISTO DESDE LA PERSPECTIVA DEL PROCESO DE DESCUBRIMIENTO DE MERCADO

FERNANDO HERRERA GONZÁLEZ*

I
INTRODUCCIÓN

Los monopolios son tradicionalmente considerados como el mayor mal en los sistemas económicos. Un monopolio se asocia siempre con poder, con poder sobre el mercado y sobre los clientes, que se traduce necesariamente en rentas superiores a las normales a costa de los compradores. Por tanto, se tiende a ver a los monopolios como los grandes explotadores de sus conciudadanos.

La teoría económica neoclásica es especialmente temerosa de estos fenómenos, lo que tiene sus raíces en los modelos de competencia perfecta. Dado que en el mundo ideal todas las empresas son pequeñas y no confrontan barreras de salida o de entrada, la situación de monopolio es tal vez la más opuesta a su paradigma. Y, efectivamente, los teóricos neoclásicos demuestran con sus modelos que la existencia de monopolios (y, en general, de empresas con poder de mercado) supone siempre una pérdida de bienestar: la empresa con poder de mercado está en condiciones de fijar un precio por encima del de mercado, restringiendo el número de unidades vendidas, y así obtener una rentabilidad extraordinaria a costa de la pérdida de bienestar de los consumidores.[1]

Tan grave es la situación para los economistas neoclásicos, que la persecución de los monopolios, y específicamente de sus conductas, ha dado lugar a una rama de derecho específica: el derecho

* Ingeniero de Telecomunicaciones, licenciado en Ciencias Económicas y Empresariales. Dirección: Av/Filipinas, 32; 28003 Madrid. Email: fherrerag69@yahoo.es.

[1] Ver, por ejemplo, Motta (2004).

Procesos de Mercado: Revista Europea de Economía Política
Vol. VIII, n.º 1, Primavera 2011, pp. 275 a 290

de la competencia o antitrust. Esta disciplina se preocupa de perseguir y sancionar a aquellas empresas que abusan de su poder de mercado para explotar a los consumidores. Consecuentemente, existen organismos regulatorios especializados en localizar y perseguir posibles conductas de abuso de posición dominante, sea de una empresa individualmente o de varias coludiendo. Asimismo, existe bastante regulación sectorial basada en la misma idea de prevenir las conductas monopolísticas de los agentes en el sector (por ejemplo, en telecomunicaciones).

No es el momento aquí de enumerar los errores que cometen los teóricos neoclásicos en su planteamiento sobre el monopolio, ya señalados por autores de reconocido prestigio.[2] La cuestión que nos ocupa es doble: cómo se origina el poder de mercado, por un lado, y qué implica su existencia en el libre mercado. Básicamente, la preocupación es si una empresa con poder de mercado es capaz de distorsionar el funcionamiento del mercado libre hasta hacer que se separe en sus resultados de lo que correspondería a las preferencias de los consumidores.

Como se desprende de los párrafos anteriores, existe una íntima relación entre el poder de mercado y la doctrina del monopolio, por lo que el punto de partida del presente artículo es un repaso de las visiones de teoría económica austriaca sobre este fenómeno, remitiendo a O'Driscoll (1982) y sus referencias para la visión de otras escuelas económicas sobre este fenómeno.

A continuación, se analiza la posible existencia de precios de monopolio en el libre mercado, siguiendo la doctrina de Rothbard. Posteriormente, se estudia la existencia de recursos en monopolio y sus posibles consecuencias. Hecho esto, se compara la existencia de rentas de monopolio en el libre mercado con los resultados del proceso emprendedor, para luego describir de qué manera el proceso emprendedor puede buscar la monopolización del recurso. Por último, se introduce la intervención estatal y se asimila la existencia de barreras legales de entrada a la de recursos artificialmente creados por el gobierno. Se cierra con unas conclusiones.

---

[2] Por ejemplo, Reisman, (1990), Armentano (1990), Cordato (1992).

II
EL MONOPOLIO EN LA ESCUELA AUSTRIACA DE ECONOMÍA

O'Driscoll (1982) realiza un completo resumen de la visión del monopolio por las distintas escuelas económicas, al que se remite para un mayor detalle de la exposición que sigue. A continuación, se extractan las características más relevantes de las aportaciones de la escuela austriaca, que O'Driscoll clasifica en torno a Mises y Kirzner, por un lado, y Rothbard y Armentano, por otro.

En cuanto a la visión misesiana, desarrollada por Kirzner (1973), sostiene que solo hay un caso en que el monopolio aparece en el libre mercado: la propiedad exclusiva de un recurso esencial. En consecuencia, la renta de monopolio es realmente la renta obtenida del recurso, y no de la actividad. Para que ello ocurra, la curva de demanda del recurso ha de ser perfectamente inelástica.

En estas condiciones, el monopolista puede retener parte del recurso contra las preferencias de los consumidores con el objetivo de elevar el precio. Sin embargo, el monopolista no es inmune al proceso competitivo, pues la entrada a la actividad no está prohibida, ni tampoco la innovación. Otra cuestión es si la actividad es realizable sin el recurso en monopolio. Mises y Kirzner, en todo caso, no consideran que la situación de monopolio tenga importancia en la práctica.[3]

Por su parte, Rothbard sostiene que no existen los precios de monopolio en el mercado libre: solo hay precios de libre mercado. No hay posibilidad operativa de distinguir entre ambos tipos de precio, en el libre mercado.

Tampoco hay forma de identificar al monopolista:

— Todos los recursos están, en cierta forma, monopolizados, pues los recursos nunca son homogéneos.
— Cualquier empresa puede fijar sus precios, por lo que todas las empresas son monopolistas en el sentido de poder influir en su precio.

[3] «The mere phenomenon of monopoly is without any significance and relevance for the operation of the market and the determination of prices it does not give the monopolist any advantage in selling his products.», Mises (1998), p. 277.

— Todas las empresas restringen su producción para elevar beneficios.

A partir de esta revisión, O'Driscoll (1982) concluye que ni Rothbard ni Mises adoptaron el enfoque de Menger, en el sentido de que monopolio y competencia han de ser tratados de forma dinámica. Según él, Mises-Kirzner adoptan una variante de la teoría neoclásica del monopolio, mientras que Rothbard desarrolla la visión de derechos de propiedad en línea con Adam Smith. Este artículo pretende ser una aproximación a la comprensión del fenómeno desde el enfoque que O'Driscoll echa de menos en, nada más y nada menos, Mises y Rothbard.

III
MONOPOLIOS Y PRECIOS DE MONOPOLIO

Como paso inicial, se trata de buscar una definición válida de monopolio, lo que aparentemente es sencillo. En efecto, se dice que *un producto está en monopolio cuando existe únicamente un vendedor del mismo* (a efectos prácticos).

Esta definición es objetiva, y no tiene contenido normativo, en el sentido de que de aquí no se puede deducir que la existencia de un monopolio sea buena o mala para la sociedad. Sin embargo, esta definición aparentemente sencilla es impractible y carece de consecuencias.

Siguiendo a Rothbard (1993, capítulo 10), en sentido estricto puede parecer que determinados empresarios, por ser los únicos que venden un bien concreto, tienen monopolio sobre el mismo. Sin embargo, las escalas de valores de los individuos son subjetivas, y son estos los únicos que pueden determinar si un bien concreto es único o puede ser sustituido por otro. No es posible determinar si dos bienes son o no homogéneos en base a sus características físicas (Rothbard, 1993, p. 19).

Dicho de otra forma, el mero hecho de ser el único vendedor de un determinado bien no implica que haya poder de monopolio, puesto que pueden existir bienes que la gente considere sustitutos del aparentemente monopolizado. Por ejemplo, la empresa

Coca Cola puede tener el monopolio de suministro de este refresco; pero la cuestión no es si ella es la única suministradora, sino si la gente cree que no hay nada como la Coca Cola, o, por el contrario, la ven reemplazable por un vaso de leche.

De hecho, este aspecto es capturado en los análisis de derecho de competencia, en los que la definición del mercado de referencia exige un análisis de sustituibilidad del producto sobre el que se ha desarrollado la conducta.

Así pues, la existencia de monopolios, según esta definición, es algo subjetivo que depende de las preferencias de los consumidores, de que estos determinen o no si dos productos son sustitutivos en cada momento. Por tanto, difícilmente se puede hablar de poder de mercado desde este punto de vista, pues el otorgamiento de la condición reside en los clientes y en sus decisiones de compra.

En otros casos, se ha definido al monopolista como *aquel productor que es capaz de fijar precios y cantidades independientemente del mercado*. En un mercado libre, la transacción depende de la voluntad de dos partes, el vendedor y el comprador. Por ello, ninguna de estas partes controla el precio sin interferencias. El vendedor es libre para proponer el precio que considere, y desde esta perspectiva podría parecer que controla el precio. Pero lo cierto es que el comprador es el que tiene o no que aceptarlo. Y si no lo acepta, el vendedor deberá rebajar el precio hasta un nuevo nivel, en que maximice los ingresos por sus ventas, nivel que está fuera de su control.

Esto es así incluso en el supuesto de que sea el único oferente del producto en el mercado en un momento dado. Por tanto, ni siquiera en este caso se puede decir que controla el precio.

Partiendo de esta definición, se puede construir una definición finalista, según la cual es monopolista *aquel agente que tiene poder para fijar un precio de monopolio*. De esta forma, se soslayan los obstáculos de tratar de determinar las características estructurales del monopolista. Ya que en el libre mercado no se puede identificar ex ante quién es monopolista, se define ex post. La cuestión pasa a ser en qué consiste un precio de monopolio.

Siguiendo a Rothbard (1993, p. 593) el precio del monopolio sería aquel que permite, produciendo menos que al nivel competitivo, obtener más beneficios. Esto ocurre en el punto de la curva

de la demanda en que ésta deja de ser inelástica. Sin embargo, esta definición no proporciona un criterio válido para identificar dicho nivel, pues todas las empresa tratan de fijar el precio en el mismo punto de la curva de demanda que perciben.

Otra alternativa sería, entonces, identificar el precio competitivo. Sin embargo, tampoco así es posible determinar cuál sería un precio de monopolio, pues la cuestión es ahora cómo definir el precio competitivo. Por ejemplo, los precios pasados no pueden constituir una referencia para dicho precio competitivo: los precios son siempre indicadores históricos que reflejan una realidad ya pasada, y son fruto del contexto de la misma. Por ello, no se puede decir que el precio que prevaleció en un determinado momento sea el correcto, y el que se dio en otro no. En ambos casos, surgen del proceso de prueba y error de los emprendedores.

A partir del modelo de competencia perfecta, los autores neoclásicos estiman que el precio competitivo es el que coincide con el coste marginal. Aparte de estar sujeta a las críticas de dicho modelo, esta concepción también incurre en un error conceptual sobre la relación entre precios y costes, puesta de manifiesto de forma muy brillante en Buchanan (1999). Y es que son los costes los que se ajustan a los precios y no al contrario: los precios son la única magnitud real aprehensible en el mercado. No cabe pues identificar unos supuestos costes marginales sobre los que calcular un precio ideal.

Por todo ello, Rotbard (1993) concluye que solo cabe distinguir entre precios del libre mercado y aquellos que corresponden a un mercado intervenido.

No obstante las dificultades en la definición de monopolio, la experiencia nos muestra actividades que presentan de forma sistemática rendimientos por encima de lo normal (esto es, la tasa de preferencia temporal). Cabría pensar que estos rendimientos anormales mantenidos en el tiempo, son una indicación de poder de mercado.

En el siguiente apartado se describen las causas de esta situación en el libre mercado y se analiza su compatibilidad con el mismo.

IV
LAS FUENTES DE LOS RENDIMIENTOS DE UNA EMPRESA

Los rendimientos de una empresa se pueden clasificar en dos tipos:

— *Rendimientos provenientes de los recursos invertidos:* consiste en la tasa de preferencia temporal que exigen los individuos por su ahorro. En el caso del ERE («*Evenly Rotating Economy*», o economía en estado estacionario), es el único rendimiento que obtiene la empresa.
— *Rendimientos procedentes de la actividad emprendedora:* consiste en los beneficios o pérdidas que obtienen los empresarios al localizar nuevos usos de los recursos. Si estos usos son más valiosos, dan lugar a beneficios, y en caso contrario a pérdidas. Esto es lo que pasa en el mundo real, en que las preferencias están cambiando constantemente. El proceso de descubrimiento de mercado es necesario precisamente para aproximar mejor el uso de los recursos a las nuevas preferencias.

En cuanto a la primera componente, se somete al principio de uniformidad de rentabilidad de Reisman (1990, p. 172). De acuerdo a este principio, la rentabilidad de todos los negocios tiende al mismo nivel, que ha de coincidir con la tasa de preferencia temporal en cada momento. La deducción es directa: en caso de que la rentabilidad sea más alta de lo normal, otros emprendedores percibirán la actividad como oportunidad, y moverán sus recursos a la misma, hasta que la rentabilidad se iguale con la del resto del mercado. Por el contrario, si la rentabilidad es más baja de lo normal, algunos emprendedores abandonarán la actividad hacia otras más rentables, hasta que, una vez más, se iguale la rentabilidad de la actividad con la del mercado. Obsérvese que para que se cumpla el principio de uniformidad, es necesario que haya libertad de entrada y salida del mercado, lo que obviamente ocurre en el libre mercado.

Por tanto, no puede ser esta componente la que dé lugar a rendimientos sistemáticos por encima de lo normal. Forzosamente

habrá de ser la otra, por tanto, derivada de localizar nuevos usos para los recursos. Pero, en el proceso de mercado, esta componente está llamada a desaparecer por la imitación de otros emprendedores. ¿Cómo es que esta componente transitoria se vuelve permanente? La única posibilidad es que el proceso de imitación se haya detenido por alguna razón. Veamos de qué forma podría ocurrir.

Para que el emprendedor pueda entrar al mercado no basta con la posibilidad de hacerlo: también es necesario que se haga con los recursos que le posibiliten tal actividad. Cabría entonces la posibilidad de bloquear la entrada al mercado en aquellos casos en que alguno de los recursos fuera singular o monopolizable.

Por ejemplo, existen recursos cuya unicidad no puede ponerse en duda, que por tanto parecen dar lugar necesariamente a poder de mercado, los recursos esenciales referidos por Mises. Por ejemplo, las Pirámides de Egipto o el Macchu Picchu en Perú, el talento para el baloncesto de Pau Gasol, o las minas de oro en España. ¿Cómo funciona el libre mercado en presencia de estos activos singulares?

Si la actividad económica precisa de un recurso singular, la entrada al mercado no será posible, puesto que el emprendedor entrante no puede hacerse con el recurso. Por tanto, la empresa que realiza la actividad podrá mantener una rentabilidad por encima de la del mercado.

Esto es así solo aparentemente. Tal como demuestra Rothbard (1993, p.479), coherentemente con Mises (1998) y Kirzner (1973), el exceso de rentabilidad no obedece a la actividad de la empresa monopolista, sino a la infravaloración original del recurso. Dicho de otra forma, en el libre mercado, es el recurso el que genera la renta extraordinaria y no la actividad de la empresa. Por tanto, el recurso tenderá a revalorizarse hasta hacerse con toda la renta extraordinaria.

Un ejemplo contribuirá a aclararlo: la explotación de visitas del Taj Mahal reporta a sus dueños un 10% de beneficios. Asumamos una preferencia temporal del 4%. El otro 6% es el beneficio extraordinario. Otro emprendedor ve una oportunidad de negocio en ese exceso, pero para explotarla ha de adquirir el Taj Mahal. Está

claro que ese exceso de rentabilidad actúa como efecto llamada, y los emprendedores adquirirán sucesivamente el recurso hasta pagar su máximo valor (que, si se quiere explotar de la misma manera, es la capitalización a valores actuales de dicha diferencia de renta (el 6%)). Si se consuma la transacción, el nuevo dueño ya no obtiene una rentabilidad del 10%, sino del 4%.

Antes		*Después*	
Inversión Taj Mahal	600	Inversión Taj Mahal	1.800
Inversión resto	200	Inversión resto	200
TOTAL	800	TOTAL	2.000
Rentabilidad	10%	Rentabilidad	4%
Beneficios	80	Beneficios	80
Imputable Taj Mahal	72	Imputable Taj Mahal	72
Imputable resto	8	Imputable resto	8

Para valorar el Taj Mahal se descuentan los 72 de beneficio anual a perpetuidad al 4% de tasa de preferencia temporal. Como se observa, el valor del Taj Mahal tenderá a ser tal que el inversor ya no obtiene beneficios extraordinarios, y todo el valor ha ido al recurso singular. Una vez puesto en valor este recurso, ya no se producen beneficios extraordinarios ni siquiera en presencia de monopolio.

V
LA VALORACIÓN DE LOS RECURSOS SINGULARES

¿Cómo se produce en el proceso de mercado la revalorización del ejemplo? Como en cualquier otro caso, son los emprendedores los que guían el proceso de valoración del activo. La mera singularidad del recurso no le da ningún valor *per se*, por mucho que lo haga susceptible de monopolización. Es el proceso emprendedor el que ha de construir un monopolio a partir de estos recursos singulares, exactamente igual que si no lo fueran

Imagínese una mina de un material desconocido (llamémosle *mithril*), mina que resulta ser única en el mundo. El mero hecho de ser única no le confiere ningún valor. Para que dicha mina tenga

valor, es necesario que el *mithril* tenga utilidad para los individuos. Y dicha utilidad solo puede ser encontrada mediante el proceso emprendedor de prueba y error.

No existe ninguna diferencia con otros procesos emprendedores: el empresario deberá anticipar recursos para hacerse con los que estima infravalorados: deberá comprar el terreno donde está la mina, montar la maquinaría, extraer el material, transportarlo… Solo tras realizar todo esto, estará en condiciones de conocer si tiene o no valor el *mithril*. El recurso singular, como todos los recursos, tendrá su valoración en función de su utilidad para la sociedad. Y su unicidad afectará a su valor solo en la medida de su escasez relativa, siguiendo la ley de utilidades marginales decrecientes.

Pero es que, además, la singularidad del *mithril* está también sujeta al proceso emprendedor, aunque su mina sea única. Pues depende de la percepción de los clientes sobre su sustituibilidad. Y esto también puede variar considerablemente según las actividades de otros emprendedores. El *mithril* puede ser único de acuerdo a sus características físicas, pero estas no son las relevantes en los bienes económicos. Para estos, lo importante es la utilidad que proporcionan a los individuos, y esto es algo subjetivo.

Compárese esta situación de exploración de los usos del *mithril* con la creación de una marca comercial o la construcción de de una red de telecomunicaciones. La única diferencia es que en este segundo caso los recursos necesarios no son singulares. Pero, aparte de ello, no hay ninguna diferencia en el proceso. Como los recursos de mayor orden no son singulares, cabe pensar que el recurso singular obtenido es más fácilmente replicable.

En resumen, no parece haber nada intrínsecamente distinto en la explotación de un monopolio a partir de recursos singulares, respecto a si dichos recursos no lo son.

Se puede concluir que ni la singularidad del recurso ni su gestión en monopolio, tienen efectos sobre su valoración. Como en todos los recursos, el valor queda determinado por las preferencias de los consumidores y el stock disponible. Dicho de otra forma: el Taj Mahal del ejemplo no vale 1800 por estar en monopolio o ser singular, sino por la entrada que los visitantes están dispuestos a pagar por verlo.

VI
PROCESO EMPRENDEDOR, PODER DE MERCADO Y OBTENCIÓN DEL RECURSO SINGULAR

Como se ha dicho, el rasgo principal del poder de mercado, es su capacidad para obtener rentabilidades superiores a la tasa de preferencia temporal.

Sin embargo, esto es precisamente lo que ocurre en el proceso emprendedor que caracteriza a los mercados libres, según la teoría económica austriaca. En efecto, en el proceso emprendedor, y mediante el cálculo de mercado, los emprendedores identifican recursos infravalorados (en su opinión) y que pueden ser puestos en valor mediante el tratamiento[4] adecuado.

Si el emprendedor acierta en su anticipación, obtendrá unos beneficios extraordinarios por encima de la tasa de preferencia temporal. Si se equivoca, no podrá recuperar los recursos anticipados, y cesará la actividad. La interpretación en el primer caso es que la sociedad valora más los recursos en su nueva presentación, y se ha de mantener la actividad acometida por el emprendedor. En el segundo caso, la sociedad le dice al emprendedor que está malgastando los recursos, y que estos deben ser repuestos a su utilidad inicial.

Se observa que el éxito del emprendedor va acompañado de unos beneficios extraordinarios procedentes del nuevo producto. Exactamente lo mismo que caracteriza a la situación de poder de mercado.

Y es que, evidentemente, el emprendedor tiene un monopolio temporal sobre el recurso singular que ha derivado de su idea, de donde obtiene esa rentabilidad extra.[5] En el libre mercado, no obstante, esta situación es insostenible, pues rápidamente otros

---

[4] Entiéndase tratamiento en sentido amplio, desde los procesos más sencillos a los más complejos, y no solo industriales sino de todo tipo (marketing, distribución, envasados, localización…).

[5] Menger (1871) constata este fenómeno: «Every artisan who establishes himself in a locality in which there is no other person of his particular occupation, and every merchant, physician, or attorney, who settles in a locality where no one previously exercised his trade or calling, is a monopolist in a certain sense, since the goods he offers to society in trade can, at least in numerous instances, be had only from him.»

emprendedores se fijan en los beneficios e inician el proceso de imitación, que hace que el nuevo valor generado se asocie a los recursos utilizados según se ha descrito antes, y vuelve a igualar la tasa de rentabilidad con la de preferencia temporal.

Dicho de otra forma, con el nuevo uso ideado por el emprendedor, el recurso ha subido de valor. El emprendedor ha conseguido recompensa por su idea, pero su actividad ya no tiene rentabilidad extraordinaria.

Se observa que es exactamente lo mismo que ocurre en el supuesto de recursos singulares. Se puede concluir asimilando el proceso emprendedor a la búsqueda de poder de mercado, o, lo que es lo mismo, a la obtención de recursos singulares.

El poder de mercado se puede obtener a través de un recurso singular natural, o combinando recursos no singulares en uno singular de orden menor. Cuanto más recursos no singulares sean necesarios para conseguir el recurso singular, más difícil será la réplica, y mayor la duración del poder de mercado. Por ejemplo, una pastelería en un barrio de nueva construcción puede ser un recurso singular durante un tiempo, pero es claro que es más fácilmente replicable que una marca consolidada como puede ser Coca Cola o que una central de generación de energía nuclear.

Al mismo tiempo, esa duración queda compensada por la mayor cantidad de recursos y riesgo que habrá asumido el emprendedor, por lo que en cierta forma, en el libre mercado, existe un equilibrio entre la duración del poder de mercado y el riesgo incurrido para obtener dicha posición. Mientras dicho equilibrio se mantenga, serán factibles inversiones de cualquier escala.

Así pues, el poder de mercado no es negativo para el mercado, si no todo lo contrario. Es beneficioso, puesto que es la posibilidad de ejercerlo la que motiva a los emprendedores la búsqueda de recursos singulares que proporcionen utilidades nuevas a los individuos. Sin esa expectativa de poder de mercado, no se elaborarían nuevos recursos singulares; o, en una formulación más tradicional, sin expectativas de rendimientos superiores a los normales, no hay proceso emprendedor.

VII
PODER DE MERCADO EN EL MERCADO INTERVENIDO

Hasta aquí el análisis en el mercado libre. En resumen, el proceso de emprendimiento es básicamente un proceso de monopolización, en el sentido de que da lugar a los supuestos «males» del monopolio (rentabilidad extraordinaria sobre la tasa de preferencia temporal). Al mismo tiempo, dicha rentabilidad es transitoria y termina incrementando el valor de los recursos involucrados, en mayor medida según el grado de especificidad de los mismos, según su escasez y, por supuesto, según las preferencias de la demanda.

En la base del proceso está la libertad de entrada de los emprendedores al mercado: no hay obstáculos para que desempeñen la actividad comercial de su preferencia. En el mercado intervenido, sin embargo, el gobierno puede utilizar la amenaza de la violencia para impedir que los individuos desempeñen determinadas actividades, y dar lugar así a rentabilidades extraordinarias vinculadas a ellas, y no a un recurso.

Efectivamente, una rentabilidad extraordinaria en una actividad en que está prohibida la entrada no podrá ser eliminada por el proceso de imitación, puesto que ningún otro empresario puede desempeñarla. Consecuentemente, ningún recurso se revaloriza como consecuencia de la actividad, como es lógico, pues su valor diferencial proviene simplemente de una interferencia con el proceso de mercado, y no de una mayor valoración por la sociedad.

De hecho, todo el valor de la rentabilidad extraordinaria se asocia a la disponibilidad del título habilitante que crea el gobierno mediante el uso de la fuerza. Si es posible la transmisión del título, se comportará como un recurso convencional cualquiera, y terminará detrayendo todo el valor, de la misma forma que lo hacía el Taj Mahal en el ejemplo.

Así pues, también aparece un recurso singular en el mercado intervenido: el derecho exclusivo que otorga el gobierno, sea cual sea su nombre (concesión, licencia, monopolio o patente). Lo que nos retrotrae a la definición original de monopolista, tal como se acuñó en el siglo XVII, según nos recuerda Rothbard (1993, p. 591): *Monopolista es quien tiene derechos exclusivos otorgados por el*

gobierno. Esto es, solo tiene poder de mercado quien tiene derechos exclusivos otorgados por el gobierno.

Tanto en el mercado libre como en el intervenido, el poder de mercado se asocia a la propiedad de un recurso singular. Son las características diferenciales entre ambos tipos de recurso las que hacen indeseable para la sociedad el poder de mercado que otorga el recurso «estatal» o bien administrativo, como lo llama Kuznetsov (1997).

— **Obtención del recurso:** el recurso singular «libre» se obtiene adelantando recursos existentes y asumiendo riesgo de equivocarse en la anticipación de necesidades del mercado; el recurso singular «estatal» se obtiene mediante presión al gobierno, y sin atender a las preferencias de los consumidores.
— **Valor del recurso:** el valor del recurso singular «libre» se sujeta a las preferencias de la sociedad, aunque se explote por un solo empresario; en cambio, el valor del recurso singular «estatal» dependerá básicamente de la actuación del gobierno, arbitraria y no sujeta a la disciplina del mercado.

  Por ejemplo, si el gobierno decide eliminar las barreras legales de entrada, destruirá completamente el valor del título. Por el contrario, si decide restringir más la entrada, lo revalorizará. Y estas actuaciones no tendrán que ver con las demandas de los ciudadanos, sino con la presión de los distintos grupos de interés.
— **Origen del recurso:** La singularidad del recurso «estatal» se debe a una decisión arbitraria del gobierno, que transforma meras condiciones generales (en la terminología de Rothbard (1993, p. 9)) en recursos escasos.

VIII
CONCLUSIÓN

En el presente artículo, se ha tratado de explicar al origen del poder de mercado bajo el entendimiento de la competencia que hace la economía austriaca, esto es, entendiendo el mercado como proceso (Huerta de Soto, 2000). Se ha observado que dicho poder

de mercado proviene de la propiedad o control por parte del empresario de un recurso singular, que no puede ser replicado fácilmente por otros emprendedores.

Sin embargo, la singularidad del recurso no es algo inherente al mismo, sino que depende de las preferencias de los individuos, y, por tanto, su puesta en valor exige de un proceso de emprendimiento, como la puesta en valor de cualquier otro recurso. Se ha mostrado que el valor del recurso es independiente de si su gestión se hace o no en monopolio, puesto que solo depende, como el de cualquier otro recurso, de las preferencias de los individuos y del stock disponible.

De hecho, se puede asimilar el proceso emprendedor a la obtención de un recurso singular, pues se ha mostrado que las consecuencias son indistinguibles en la práctica. Dado que la principal característica de las empresas con poder de mercado es su capacidad para obtener rendimientos por encima de lo normal, y esto es justo exactamente lo mismo que obtienen los emprendedores si tienen éxito, se puede decir que cualquier emprendedor de éxito tiene poder de mercado, esto es, ha conseguido un recurso singular.

La replicabilidad de dicho recurso es inversamente proporcional a los recursos que sea necesario anticipar para conseguirlo. Por tanto, existe una cierta armonía entre el riesgo incurrido para obtener el recurso singular, y el tiempo en que se podrá ejercer el poder de mercado consecuente y obtener rentabilidades extraordinarias. Si este equilibrio se rompe de alguna forma, disminuyen los incentivos de los individuos a emprender.

En suma, el poder de mercado otorgado por el recurso singular es fundamental para que exista el proceso emprendedor. Sin esta expectativa, este proceso no se llevaría a cabo. En el mercado libre, el poder de mercado es reflejo de una mejor utilización de los recursos en el servicio a los ciudadanos, que percibe un cierto grado de unicidad en los bienes/servicios que le suministra el agente.

No tiene por qué ocurrir lo mismo en el mercado intervenido, donde el gobierno puede crear recursos singulares mediante la amenaza de violencia, y sin proceso emprendedor. En este caso, el poder de mercado puede no proceder de un mejor servicio a los individuos, sino de una decisión arbitraria ajena al mercado.

En consecuencia, este poder de mercado no es transitorio, ni supone una revalorización de los recursos involucrados.

En conclusión, en el libre mercado el poder de mercado de las empresas depende de las preferencias de los consumidores, por lo que no se puede hablar en puridad de poder de mercado. Donde sí parece existir verdadero poder de mercado, independiente de la voluntad de los consumidores, es en el mercado intervenido, cuando los gobiernos crean recursos singulares mediante la amenaza de la violencia, impidiendo la libre provisión por los emprendedores de determinadas actividades.

REFERENCIAS BIBLIOGRÁFICAS

ARMENTANO, D.T (1990): *Antitrust and Monopoly: Anatomy of a Policy Failure*, Oakland, CA: The Independent Institute.

BUCHANAN, J.M. (1999): *Cost and Choice*, Indianapolis, IN: Liberty Fund.

CORDATO, R. (1992): *Welfare Economics and Externalities in an Open-Ended Universe: A Modern Austrian Alternative*. Boston: Kluwer Academic Publishers.

O'DRISCOLL, G.P. Jr. (1982): «Monopoly in theory and practice», in Kirzner, I.M. (1982): *Method, process and Austrian Economics*, pp. 189-213.

HUERTA DE SOTO, J. (2000): *La Escuela Austriaca: mercado y creatividad empresarial*. Madrid: Editorial Síntesis.

KIRZNER, I.M. (1973): *Competition and entrepreneurship*. Chicago and London: University of Chicago Press.

KUZNETSOV, Y. (1997): «Fiat money as an Administrative Good». *Review of Austrian Economics*, 10(2), pp. 111-114.

MENGER, C. (1871): *Principles of Economics*. Chicago: Chicago Press University.

MISES, L. von (1998): *Human action: A treatise on economics (The Scholars Edition)*. Auburn, AL: Ludwig von Mises Institute.

MOTTA M. (2004): *Competition Policy: Theory and Practice*. Cambridge (UK): The Cambridge University Press.

REISMAN, G. (1990): *Capitalism*. Ottawa, IL: Jameson Books.

ROTHBARD, M.N. (1993): *Man, economy, and state*. Auburn, AL: Ludwig von Mises Institute.

AN AUSTRIAN ANALYSIS OF THE NAZI ECONOMIC RECOVERY (1933-1939)

DAVID SANZ BAS*

Dictatorship is a governing system
in which everything which
is not forbidden is compulsory

ENRIQUE JARDIEL PONCELA

Hitler came to power in 1933. By that time, the economic situation of Germany was critical: there were almost six million unemployed, prices were in a decreasing trend and production had reduced considerably. In other words, Germany was suffering the worst economic crisis of its history. The Nazi Party promised to solve this dramatic situation and the truth was that, after six years, the German economy reached full employment, the industrial output doubled and the Government raised a strong army. This amazing development has always puzzled many historians. How did they achieve this? What was the secret of the Nazis? In opinion of many economists and historians the Nazi Recovery demonstrated the power of the State to overcome economic problems. Thus, according to this view, the State could solve even the worst economic crisis, if it applied the right policies. Is this view correct? Could we learn anything from this historical episode to overcome economic crises? Did the Nazis discover the secret of full employment? In this paper I will study the Nazi growth strategy and I will try to answer these questions. In the first part of this article, I will explain the concrete policies that

* Ph. D. in Economics (King Juan Carlos University) and member of *Juan de Mariana Institute*. (e-mail: davidsanzbas10@gmail.com)

Procesos de Mercado: Revista Europea de Economía Política
Vol. VIII, n.º 1, Primavera 2011, pp. 291 a 314

were undertaken by the Nazi Government, in the second part I will analyze them and finally there will be a section with the main conclusions.

I
THE NAZI STRATEGY

1. The facts

The German economy was severely hit by the Great Depression. During the second half of 1920's there was a massive credit expansion process which brought about a huge boom that ended in a sharp depression.[1] After four years of political and economic crisis, Hitler came to power and his main objectives were to solve this critical situation and to restore the national dignity. Beforehand, it is appropriate to look the evolution of the main macroeconomic magnitudes (Table 1).

As we can see, unemployment was reduced extremely quickly and at the same time real production increased. If we look in more detail, the industrial production doubled in this period. And what happened to prices? We can say that prices did not increase significantly: just 10% if we take the official prices and 20% if we trust John Klein's estimations. It is not an exaggeration to say that any Prime Minister would like this economic development for his country. Let's explain what policies they exactly undertook to achieve these results.

2. Economic policies

The mind behind the Nazi Recovery was Hjalmar Schacht (1877-1970). He approved several measures in order to achieve two main objectives: rearmament and work creation. We could distinguish

[1] There are some peculiar features of this crisis, but we will not explain them here as it would far exceed the purpose of this article. However, a good overview could be found in: Bagus (2007), pp. CCXVII-CCLII.

TABLE 1

MACROECONOMIC FIGURES OF GERMANY (1932-1939)[2, 3]

Year	*Unemployment (millions)*	*GDP bn RM*	*GDP bn RM (prices 1928)*	*Industrial production (1928 = 100)*	*Official Wholesale Prices*	*Price level estimations of John Klein*
1932	5,6	57,6	71,9	58	100,0	100,0
1933	4,8	59,1	73,7	66	96,7	100,7
1934	2,7	66,5	83,7	83	102,0	103,8
1935	2,2	74,4	92,3	96	105,5	106,8
1936	1,6	82,6	101,2	107	107,9	109,3
1937	0,9	93,2	114,2	117	109,7	114,4
1938	0,4	104,5	126,2	122	109,5	115,6
1939	—	—	—	—	110,8	120,4

[2] For the first four columns I use Overy (1991), p. 29 and for the two last columns, Klein (1973), p. 140.

[3] It is important to say that these figures are only estimations. German macroeconomic data of this period is not at all clear for two reasons: first, the Nazis elaborated a complicated system of shadow budgets and, second, in those days German public accounting rules were deliberately opaque in order to hide deficits away from the Reparation Agent's monitoring staff in Berlin. See Ritschl (2000), p. 4.

two kind of polices, massive public work programs and private incentives:

1. Massive public work programs: The Government promoted civil and military projects. The first ones included construction of highways, railroads, housing and general construction, and the second ones included the production of weapon and military vehicles, massive recruitment, construction of defensive military infrastructures, production of synthetic raw materials to avoid the German dependence of the foreign markets, etc. It is not at all clear what the proportion between military and civil expenditure was and when the rearmament exactly began. However, Albrecht Ritschl's estimations seem to be quite accurate, so I will base my analysis on these data.[4] Looking at them, the following features of these public expenditures programs could be deduced:

   a. The Central Government spending between April 1932 and March 1933 (fiscal year) was 1.950 billion ReichMarks and between April 1938 and March 1939 it was 24.154 billion ReichMarks, i.e. in six years the public expenditure increased more than 1200%. Or, in other words, the budget increased more than a 50% accumulative each year.
   b. The total amount of money spent by the Central Government between March 1933 and April 1939 was 72.736 billion ReichMarks. Of this figure, the military expenditure represented around 70% of the total (i.e. 51.432 billion ReichMarks) and the rest was civil expenditure.
   c. Germany began a fast rearmament during the second year of the Nazi regime: in 1934-1935 military expenditure represented 51% of the total expenditure (the following years this proportion was higher and even reached 80% of the budget).[5]
   d. In 1932, the public investment represented 25.8% of the current investment of that year and in 1938 it represented

[4] Ritschl (2000), Tables 1, 2, 3, 4 and 5.

[5] Other historians such as Richard Overy defend that rearmament started in 1936. Therefore, there is not a consensus among specialists about this issue.

41.6%. However, this figure undervalues the control over investment that Hitler's Government really had: according to the *National Labour Law* (1934), the State would exert direct influence and control over all business employment over twenty persons. In other words, medium and large companies were put under the control of the Government. The Nazis took this economic control gradually. We could say that the turning point was 1936 when the *Four-Year Plan* was approved. This Plan used medium and large private companies as parts of the global rearmament strategy. The economic control was carried out through regulations, political interference in the companies and credit rationing.

2. Private incentives:

   a. Farming sector: tax breaks, measures to increase agricultural prices, reduction of interest rates for farm businesses and tariff protection. After 1933 this sector experienced a huge increase in its activity and also this brought about a significant increase in the demand for some capital goods (tractors, etc.) which had spillover-effects in other industries.
   b. Automobile sector: before 1933 this sector was highly taxed because it was considered that automobiles were a rich and aristocratic whim. This high taxation prevented its development during 1920s. However, Hitler wanted to change this situation so he helped this sector with huge tax reductions and a lot of propaganda to promote car sales. Therefore, one of the aims of the Nazi's regime was the motorization of Germany. Thus, during 1930s there was a huge boom in this sector and automobile production increased 300% in 6 years.[6]
   c. Support for small businessmen: the Government used small businesses as contractors; therefore, lots of small firms provided inputs to the State for the building, road construction

[6] For an interesting discussion about the motorization in the 1930s see Overy (1975), pp. 466-483, Spenceley (1979), pp. 100-106 and Overy (1979), pp. 107-113.

and rearmament. In addition, there were tax breaks in these sectors. Of course, all of this helped to increase the activity in these areas.

d. Anti-trade union policy: the Government created a single trade union (*Labor Front*), forbade strikes and froze salaries. This measures helped firms to control costs and to increase production.

Finally, it is appropriate to comment briefly other additional measures to reduce unemployment:

a. The creation of the *Voluntary Labour Service* (VLS) and the *Voluntary Youth Service* (VYS) which were similar to the *Civilian Conservation Corps* introduced by Franklin D. Roosevelt in the United States. In particular, the VYS planted forests, repaired river banks and helped reclaim wasteland.
b. Also, the Nazi Government reduced unemployment by introducing measures that encouraged some women to leave the labour market. For example, newly married women were paid a lump sum of 1.000 ReichMarks to stay at home.

3. Financing policies

As we have seen, the Nazi Government increased the public expenditure really fast. How could they pay for all of these expenditures? They used three sources of incomes:

1. Debt monetization: since the German hyperinflation, the Reichsbank had strong statutory restrictions on lending money to the Government. But the Reichsbank could still discount bills of exchange. With these restrictions, Hjalmar Schacht had an idea: the Government could issue bills of exchange to pay contractors and suppliers and later the Reichsbank could discount them so these entrepreneurs would have their money; thus, through this method the central bank would monetize the Government debts. The process worked as follows: first, the Government paid businessmen that worked as contractors

with bills of exchange issued by it, then these companies could discount these bills of exchange at certain commercial banks; later these banks could rediscount those bills at the Reichsbank. Even though these bills were issued with maturation periods of six months, these maturation periods were extended to five years and, therefore, the State did not have to pay its debts to the Reichsbank during this period. Thus, at the end the Government financed its public programs by issuing a five year debt that was massively discounted (i.e. monetized) by the Reichsbank. With this strategy, the Government financed part of the civil and military expenditures:

a. Civil projects were financed with «work-creation bills». This source of financing was important above all the first two years of the Nazi regime (the first year, it represented around 33% of the total Central Government incomes). After that, the Government changed its strategy and financed itself through the capital market.
b. Military projects were financed secretly with the so called «Mefo bills». The Government created a fake company called *Metallurgische Forschungsgesellschaft* or «Mefo» (in English, *Metallurgic Research Society*) and used it to issue bills to pay the contractors. The aim of this subterfuge was to finance the rearmament secretly. Thus, these Mefo bills were really important in the Nazi financing strategy: during 1930s this false company issued bills of exchange valuated in 11.850 billion ReichMarks (aprox.), i.e., it paid the 23% of the Nazi rearmament.[7] All this secret financing strategy was discovered by the Allies in the Nuremberg Trials.

2. Forced public debt purchase: under the Nazi regime, all capital transactions were controlled by the Government. Thus, banks needed special authorizations to lend money to companies and companies needed special authorizations to issue shares or bonds. So the Government decided which companies could expand their activities by borrowing money in the market. This

[7] Ritschl (2000), Table 5.

was one of the mechanisms used by the Nazi's Government to control and to redirect the private investment to the goals they wanted. In this situation, banks and private savers could lend money (mainly) to the Government or, in other words, they were forced to buy public debt to cover the public deficits. Therefore, the State used this credit monopsony to finance its activities. Thus, between 1933 and 1939 the Government issued public debt valuated in 17.858 billion ReichMarks,[8] i.e. almost the 25% of the whole public expenditures were paid this way. Therefore, massive forced public debt purchase strategy was one of the main sources of public financing.

3. Taxes: Heinrich Brüning's Government (1930-1932) increased significantly the level of taxation in order to balance the public budget and when the Nazis came to power in 1933 they did not modify those taxes. Thus, the revival of economic activity that occurred between 1933 and 1939 brought about a substantial increase of the social income and therefore of the tax revenues. Besides, at the same time, the decrease in unemployment reduced the costs of unemployment relief. This is why taxation was also one of the main sources of extra funding that helped Hitler's Government to achieve its economic aims.

In short, these three financing strategies (debt monetization, forced borrowing and high taxes) provided the Nazi Government all the income they needed.

4. Other measures

It is appropriate to highlight other additional measures that the Nazi Government took:

1. Germany had a big problem with its balance of payments: on the one hand, almost all countries devalued their currencies at the beginning of the 1930s and/or erected several tariffs to protect their national industries; on the other hand, Germany

[8] Ritschl (2000), Table 5.

had limited international reserves and a great need for raw materials and other inputs; besides, they did not want to devalue the ReichMark because this would not have been politically well seen as it would have recalled to the Germans the hyperinflation's experiments of the 1920s and because this would have increased the real external debt of Germany. The first year of the Nazi regime (1933-1934), Germany used almost all its international reserves of gold and foreign currencies. In this situation Hjalmar Schacht approved his *New Plan* (1934): heavy control of international trade and of foreign currency receipts, bilateralism, international barter, special contracts to foreign sellers, etc. Thus, between 1933-1939 Germans reduced their economic contact with the rest of the world, but they never reached autarky.

2. The Nazi Government strictly controlled the growth of the consumer demand by forcing saving creation (this will be explained later in more detail). Therefore, consumer demand did not increase too much during this period. Besides, during the Recovery the Government directed as many resources as it could towards investment industries because its aim was to increase the industrial power of Germany. Indeed, especially after 1936, almost all investment was channelled directly or indirectly towards military industries. This entire plan was carried out through credit control, taxes and public regulations.[9]
3. In November 1936 there were inflationary problems and the Government reacted with a decree that established a massive price control. They also approved strong measures against the black market such as severe punishment and sometimes executions. According to Martin Wolfe, the Government struggle against the black market was especially successful during the war.[10]

In short, we can say that the Nazi recovery was a mix of Keynesianism (public works programs and tax incentives) and a detailed control over the economy (regulations, prices controls,

[9] Wolfe (1955), pp. 396-399.
[10] Wolfe (1955), pp. 395-396.

strong intervention in the industrial activity, etc.). Thus, the Nazis tried (and succeeded) to boost the economic activity and, at the same time, made sure that the expenditures went where they wanted. It is often said that the Nazi Recovery was a truly Keynesian Recovery and, therefore, it proved that Keynes' theories were right. For example, Joan Robinson even said that, «Hitler had found a cure against unemployment before Keynes had finished explaining it» and Michal Kalecki defended that the Nazi Recovery was a good example of «military Keynesianism». However, from my point of view these interpretations are false. The Nazi Recovery was not exactly Keynesian:

— Firstly, Keynes defended public investment but, according to him, at the same time the Government should discourage saving and promote consumption in order to increase the «multiplier effect» of the initial investments over the aggregate demand. However, the Nazis encouraged savings and discouraged consumption and they deliberately tried to maintain low multiplier effects.
— Secondly, Keynes' theory holds that the public expenditure has to be the initial push that would lead the economy towards recovery, but for the Nazis the public expenditures and the highly controlled «private» investment was essentially what the recovery consisted in (especially after 1935).
— Thirdly, Keynes defended public expenditure because he assumed that if there are idle resources, there will not be crowding out effects (as we shall explain later, this is no true); however, the Nazis deliberately restrained private investment in certain areas to increase public investment and redirected private investment towards strategic sectors.
— Finally, the strong control of the economy (prices, wages, industrial processes, etc.) that characterized the Nazi Recovery is not Keynesian.

In conclusion, the essence of the Nazi Recovery was not exactly Keynesian. This period is just a good illustration of how the State could transform a market economy in a planned economy without a communist expropriation as the means of production.

This is why Ludwig von Mises named this system *German's socialism*.

II
THE AUSTRIAN ANALYSIS

After this description of the economic policies that were carried out in Germany, I am ready to analyze them. Thus, my aim is to evaluate to what extent these policies were responsible of the economic revival, if they were appropriated and sustainable and which were the costs (if any) that they implied. I would like to point out a few things about the Nazi Recovery:

1. It cannot be said that Hitler's policies were the only force behind the Recovery. Heinrich Brüning's Government (1930-1932) engaged in highly orthodox policies (reduction of public expenditure, deflation, non-devaluation of the Mark)[11] which helped to restructure the German economy. Crises are periods of error-correction and they are necessary for the arrival of the recovery. So, during 1930-1932 the German economy eliminated wrong investments and therefore «cleansed» its structure of production. For these reasons, these Brüning's polices were strictly correct. It is true that Brüning's Government also approved incorrect policies such as tax increments, foreign exchange control and subsidies that did not help the economic restructuration; however, I do agree with Professor Philipp Bagus that, despite of these wrong polices, «his *deflationary* policies mostly worked to speed up the recovery».[12] Therefore, I believe that the recovery would have been impossible without this period of mal-investment correction. Indeed, many historians have pointed out that there were signs of economic recovery in the fall of 1932 (i.e. before Hitler came to power). Thus, we should not forget that the German economy passed through a sharp process of economic reorganization before

[11] Overy (1991), pp. 21-27.
[12] Bagus (2007), p. CCLVI.

1933. In conclusion, in my opinion, the Nazis came to power when the economy was prepared for an economic recovery.[13]

2. Some of the measures that Hitler took were appropriate and, therefore, pushed the economic revival: the elimination of certain taxes and price stability. Also, the Government succeeded in eliminating strikes and labor-entrepreneur conflicts. Obviously both were good measures to facilitate the creation of wealth. Moreover, under Hitler's regimen there was more internal political stability and therefore this could have encouraged entrepreneurs to increase their investments during the first years. Finally, the Government froze salaries and as long as this measure helped to control costs, this was adequate; but at the same time this measure was inappropriate in the sense that it distorted the price formation process. Prices are signals to entrepreneurs (in a broad sense): when a work service is expensive, this means that a) the entrepreneurs would need to use other kind of workers and b) workers would have an incentive to improve their skills in this area. That is how the price system coordinates the actions of different individuals and permits a spontaneous and smooth process of development. So, from an economic point of view, it was an error to freeze salaries because this disturbed the efficient allocation of the labour force.
3. The «economy of abundance». Keynes stated that when there are idle resources, more aggregate demand means more stable employment. In my opinion, in a normal situation, this statement is mistaken: an artificial increase in the demand in certain areas of the economy usually distorts the capital structure, misallocates employment by creating unnecessary and unstable jobs and could destroy a lot of employment in the most capital-intensive stages of production (Ricardo effect).[14] But, as Hayek admitted,[15] if the economy is in a situation of *full* unemployment (i.e. there are unemployed resources in all the stages of the capital structure and stocks of goods of all kinds, or in other words, there is a complete «abundance» of

---

[13] Bresciani Turroni came to the same conclusion. See Turroni (1938), p. 76

[14] Hayek (1958), pp. 220-244.

[15] Hayek (2009) , pp. 373-376.

idle means), the increment of the aggregate demand would create stable employment. Of course, according to Hayek, when this *full* unemployment is over, the Keynesian policies are once again dangerous. Taking into account this theoretical digression, it might be possible that in 1932-1933 the German economy was a situation of *full* unemployment: there was extremely high unemployment in all the branches of the economy (the unemployment rate was almost 30%) and there were lots of unused capital goods. So, if this was true, we could say that the public expenditure policies applied during the first year of the Nazi's Government were appropriate and this would explain the fast recovery of the economy during 1933-1934. However, it is very likely that at the end of 1934 German *full* employment was over, so after that Government's policies were probably completely inappropriate and they distorted once again the structure of production.

4. From a macroeconomic point of view, if there are increases in investment without any *ex ante* or *ex post* saving, these new investments would increase social income, which would increase final demand and, in turn, produce inflation (i.e., increases in the final *price level*). Inflation is the signal that there is a lack of coordination among producers and consumers and is the previous step of an economic crisis. Therefore, Friedrich Hayek defended that in order to avoid the apparition of this phenomenon there has to be a proportionate increase in real savings (either *ex ante* or *ex post*). This is the only way to create a stable capital structure. Thus, taking into account this reflection, it could be said that the absence of inflation until 1936 indicates that the German economy generated enough savings to finance its new investments during the first three years of Nazism. There were several sources of saving in those years:

    a. Firstly, it is true that the State paid a huge part of the public investment with newly issued money (work-creation bills and Mefo bills), but also they forced people to save their incomes:[16]

[16] Balogh (1938), pp. 470-472.

i. The nominal rates of taxation remained at the very high levels established during the depression and especially taxes on consumptions remained high. In addition, some taxes were increased (for example, the tax on corporations was increased by 50%).
ii. The Nazi's Government imposed forced saving through a compulsory social insurance which had a huge surplus.
iii. As we said before, the Government froze salaries in 1933. We could interpret this as another measure to control final demand.
iv. Also, companies could only pay a limited amount of dividends to their shareholders. Again, this measure prevented consumers to increase their final demand.

b. Secondly, at the same time, lots of Germans voluntarily saved a significant share of their incomes: in particular, most people repaid their debts and others used their new incomes to rebuild their cash balances.[17]
c. Finally, private borrowing and share issuing was almost forbidden and most banks could only lend money to the Government. This was another way to control the increase of the social income and, therefore, consumption.

In short, during the first years of the Recovery, the German economy generated enough savings to cover the investments that were undertaken. Also, it is worth saying that these savings were mainly *ex post* savings as they were created in parallel with investments. For this reason, it could be said that at the beginning the Government succeeded in controlling consumption and that is why this new investments did not create inflation. However, in 1936 (and thereon) inflation appeared and this indicates that there were not enough savings to finance the current investments. Or, in other words, this phenomenon indicates in 1936 (and thereon) that the flow of money that arrived to the final markets was larger than the parallel flow of goods and final services that arrived at the

[17] Turroni (1938), pp. 79-80.

same time to the final markets. This is why inflation tells us that there are not enough savings to maintain a harmonic economic development. In this situation, the Nazi Government tried to repress inflation through the imposition of a comprehensive price control (November 1936). Therefore, after this date, the Government eliminated the free market economy in Germany and substituted it with a sort of planned economy.

In short, at least during the first years, as Keynesians would say, the «multiplier» of the public investments was very low (which from an Austrian point of view was a good thing).[18] Therefore, we have to recognize that in this respect the Nazis were really smart: during the first years they avoided inflation through a combination of forced and voluntary saving. Again, this proves that the Nazi recovery was not exactly of a Keynesian nature: the Keynesian theory defends that the objective of the public expenditures is to provoke further expenditures in the market, so this would create more demand and therefore more employment (multiplier effect). However, from an Austrian point of view this Keynesian snowballing of expenditure throughout the market is extremely dangerous because it would shorten the capital structure and therefore would impoverish the whole society.[19] Therefore, we can conclude that until 1936 in this respect the Nazis chose their strategy wisely.

5. The German production increased in a spectacular way during the thirties, but this is not surprising because the only thing that happened was that almost six million workers started to produce things. But the Nazi recovery had some costs that are sometimes overlooked:

Lack of efficiency:

a. Price control and wrong allocation of resources: the recovery was far from being efficient. The role of prices in the market was to transmit information to the entrepreneurs. If the raw material X is expensive, this means that this resource is

[18] Turroni (1938), p. 80.
[19] Huerta de Soto (2009), pp. 344 and following.

scarce and that it has to be economized, therefore, in this situation entrepreneurs would tend to use cheaper substitutes and the producers of this raw material would increase their production. But if the Government fixes prices and wages, it is impossible to know the real scarcities and, therefore, entrepreneurs would not be able to use inputs in an efficient way. Also, it is inconceivable that the State could know how to correctly allocate the scarce resources in a complex economy (*Austrian theorem of the impossibility of socialism*).[20]

b. The German policies brought about some capital consumption in the private sector at least during 1933-1936[21] and probably during the rest of the period. Since entrepreneurs could not perform calculations without using real prices, they had no way of knowing if they were maintaining their capital or not. Besides, since the Government constrained private borrowing or share issuing, many private companies could not maintain their productive capacity.
c. The autarkic tendency and the heavy control among the foreign transactions reduced the advantages of international exchange. This was another source of global inefficiency.
d. The Government interfered in the entrepreneurial actions: the Nazis fixed their goals, the companies had quantitative restrictions for dividend distribution, lots of inputs were rationed and prices were fixed. Under these circumstances there were no incentives to economize and to produce with efficiency.
e. Most of the plans of work creation were deliberately labour-intensive and, therefore, not very productive. As an example, in July 1933 the Government prohibited the tobacco industry to install new machinery just so that more employment would be created.[22]
f. Also, planning was sometimes incoherent and military officers without entrepreneurial formation interfered in the direction of the different companies.

---

[20] Mises (1990), Huerta de Soto (2010).
[21] Klein (1948), p. 67.
[22] Bärwald (1934), pp. 627-628.

In short, there was a great lack of efficiency in the German economy. According to Richard Overy, in 1938 the output per man-hour in Germany was lower than in the USA, France, UK or even Italy and Sweden.[23] So despite all these investments and the massive introduction of cars/lorries/tractors during the 1930s, the productivity increased very slowly during this period.

Also, it is well known that there was a significant and general reduction in the quality of the products.[24] For example, this was especially visible in the quality of clothes. Of course, the reduction in quality made exporting German products more difficult.

Misleading statistics:

If we look at the Nazi macroeconomic statistics, we have to admit that they are quite amazing. But the truth is that we cannot consider all the production of the 1930s as necessarily having a real value. Of course, if we take money in a coercive way (creating it, borrowing it with by the force, or taking it from the economy through taxation), we could hire workers and produce pyramids (for example), but should we consider this as an increase in the wealth of a community? The answer is negative. Unless there is a voluntary transaction, it cannot be said that there is wealth creation. So, in the case of Germany, it is extremely doubtful that we could consider that all the highways, houses and all the military products were as valuable for the Germans as the official statistics stated. It is very easy to fall into the trap of the GDP statistics, but we have to be careful with that: building submarines cannot be considered a wealth-creating activity for the average German. And the same can be applied to the civilian construction that was made by the Government: we do not know how much Germans valuated the highways or the new houses. Of course, we are not saying that these projects were completely valueless, but

[23] Overy (1991), p. 11.
[24] Temin (1990), pp. 305-306.

we cannot agree that they were as valuable as the statistics are trying to show. Indeed, they were probably much less valuable.

Also, the statistics conceal the opportunity costs of public expenditure: as long as the public expenditure displaced private projects of more value (crowding out effect), we could say that those public projects were a net loss for society. For example, in order to build all these highways, there had to be an investment from many productive resources (labour, capital goods, raw materials) that could have been used to make other things like books, food, spectacles, better clothes, etc.; thus, all these goods and services that were forgone in order to build these highways meant a big opportunity cost for Germans. Therefore, we could say that many of the (inefficient) projects that the Nazis carried out were a net loss for society because of the opportunity costs that they implied.

Of course, from the point of view of the members of the Nazi Party, all these projects (military and non-military) were wealth production because they satisfied the subjective preferences of Hitler and his advisers. But, it would be extremely naïve to accept the GPD statistics as a measurement of the wealth-creation during 1930s. In short, a considerable part of the Nazi Recovery cannot be considered wealth creation in a general sense.

Unsound recovery:

At the end of the 1930s there were signals of the non economic sustainability of the Recovery in the medium and long term:

a. Growing crowding out effects. In 1938 there was evidence that this growth strategy had reached its limits: full employment was achieved and the increment of military expenditures led to a growing diversion of resources away from the consumption sector; i.e., crowding out effect started probably in 1935, but at the end of the 1930s those effects were huge.
b. Growing misallocation of resources: the elimination of price system made it impossible to allocate productive resources

with economic criteria. It is doubtful that an economy could survive in the long run with this uneconomic strategy.

c. Growing inflation: since 1936 there were several inflation problems. The Government replied with a strict enforcement of wage and price controls and repressing measures against the black market that appeared in consequence. In the long run, this inflation (i.e. this lack of savings) would have probably brought about a hyperinflation process.
d. Over-indebtedness tendency: in 1933 the public debt was 23,5 billion ReichMarks (aprox.) and in 1938 it was approximately 57,5 billion ReichMarks, i.e. it increased around 250% in six years.[25] However, the truth is that Germany was not too indebted in 1933 because the previous hyperinflation wiped out all the internal public debt generated until 1923; indeed, at the beginning of the Recovery Germany's public debt represented only 40% of its GDP. Besides, despite this absolute increment of 250% of the nominal debt, in relative terms the public indebtedness did not increase too much because the production boosted during the 1930s; thus, in 1938 the public debt only represented around 55% of the GDP. Therefore, it cannot be said that Germany was over-indebted in 1938. However, it is obvious that the Nazi strategy had an inherent tendency to over-borrow; thus, in the medium/long run, this financing strategy would have been unsustainable.

In short, in the long run there are several doubts about the sustainability of the Nazi economy because of the growing inflation, the misallocation of resources, the crowding out effect and the over-indebtedness tendency. However, it has to be said that the Nazi Recovery had good results in the short run: unemployment was reduced really quickly, Nazis maintained and increased the support of the population and the Government could raise a strong army in only six years. As we have seen, all these goals

[25] I calculated these figures combining Overy's estimation of the nominal GDP (see Table 1 of this article) and Albrecht Ritschl's estimation of public debt/GDP in those years (see Ritschl (2000), Figure 5).

were achieved through a Keynesian policy of deficit spending combined with a strict control of the economy (prices, wages, foreign trade, types of investment, consumption restriction, etc.). Therefore, this strategy worked very well for the achievement of their initial ends: maintaining and increasing the support of the population and rearmament. Let's analyze them in more detail:

— Support of the population. The massive work creation and the economic revival ensured a huge support among the population. But, what happened to the standard of living? We could say that probably the average German was better off in 1938 than in 1932 because at least everybody was employed. Nevertheless, it is not clear if this is true if we compare 1938's standard of living with 1927's. Here the historians have not reached an agreement. However, I think that it is likely that the standard of living was lower in 1938 than in 1927. Firstly let's take a look at the salaries: Brüning's Government cut nominal wages by decree in December 1931 to the height of January 1927, i.e. 10-15%.[26] Then, two years later (in 1933) the Nazi's Government froze salaries by decree. Therefore, nominal wages in 1938 were the same as in 1927 (more or less). Regarding consumer prices, it can be said that they were 20% lower in 1933 than in 1927[27] and that during the 1930s they increased 10% if we trust the official prices or 20% if we trust John Klein's estimations. Therefore, these imprecise calculations[28] tell us that real salaries could have been even higher in 1938 than in 1927 because nominal salaries were similar and consumer prices may have been lower; besides, in the worst case (i.e., accepting John Klein's price level estimations) real salaries could have been similar. However, there are four motives to question this statement:

[26] Bagus (2007), p. CCXLIV.

[27] Bagus (2007), p. CCXLI (see Chart 11).

[28] I am perfectly aware that the concept of price level is not accurate or even scientific. However, just for the sake of illustration, I decided to do this aggregate analysis.

- Firstly, during 1930s there was a significant reduction of the quality of the consumer good. Therefore, this factor reduced 1938's real wages.
- Secondly, consumption taxes were higher in 1938 than in 1927 because of the new taxes introduced by Brüning's Government. Therefore, *ceteris paribus*, Germans real disposable income would have been lower. Besides, Brüning's Government also drastically reduced the size of the German welfare state of the 1920s.[29]
- Third, the productivity of the German economy did not increase significantly during the 1930s; this indicates that full employment production must have been more or less similar in 1938 and in 1927. However, in 1938 military expenditure was considerably (much) larger than in 1927 and, therefore, civil production had to be lower in 1938 than in 1927. Thus, German consumers had a greater supply of consumer goods in 1927 than in 1938 and, therefore, this would indicate that the standard of living was lower under the Nazis. It is true that workers were benefited by paid holidays and cheap facilities for the «approved» enjoyment of leisure. (According to Thomas Balogh this device was consciously used to shift consumption towards areas where the supply was, or could be made to be, elastic, and to avoid as much as possible the necessity for direct rationing action).[30] But, it is unlikely that these extra-salaries could be considered as a substitution of the extra consumer goods supply available during 1927.
- And finally, the Nazi's Government made a huge effort to restrain consumption and mainly favored the increases in the industrial capacity. In contrast, during the expansion of the late 1920s (1925-28) and in the post-war revival (1948) it was primarily the consumption industries that expanded (i.e. the opposite of the 1930s).

---

[29] Bagus (2007), p. CCXLIII

[30] For a discussion on this topic see Balogh (1938), pp. 482-483 and Turroni (1938), p. 85.

All of this makes me inclined to think that the real wages (and therefore the standard of living) were lower in 1938 than in 1927. Nevertheless, the Recovery was good enough to maintain and increase the support of the German population for the Nazi's Government. Therefore, we can conclude that this political aim was satisfied.

— Rearmament: the Nazi strategy worked very well as a way to rearm Germany. We have to remember that at the beginning of the 1930s the German army was tiny, unprepared and purely defensive. In just six years they built up a potent army that later proved to be strong enough to challenge the World. Even so there are a couple of points we need to take into account:

  – Firstly, the military success of the Nazis cannot be explained just by reference to the equipment of the soldiers and the quality of the weapons: the military strategy, the smart German generals and good officers are also part of the explanation.
  – Secondly, although the Nazi army was well prepared and organized, the German industry could not support it appropriately during the Second World War because all the economic inefficiencies of the German economy became evident. It could be said that this was one of the main reasons for the Nazi defeat. Also, it illustrates the non-sustainability of the Nazi economy in the medium/long run.

III
CONCLUSIONS

We can draw three conclusions from the analysis of this experience:

a. Firstly, we have to admit that the Nazi strategy was extremely appropriate for the Nazi's aims. Thus, the Nazi experiment is a good illustration to show the power of the State to control and redirect the economy towards certain goals in a short period

of time. Besides, it is also a good example of how the State could eliminate a market economy and transform it into a planned economy without communist expropriations. But, at the same time, the German recovery is a good illustration of the impossibility of central planning and the limits of the State.

b. Secondly, economists and policy makers should never ignore the social and political context of any economic crisis. We can say that Heinrich Brüning did not weight correctly all the social and political factors and, although he applied some correct economic policies, these measures brought about a huge increase in unemployment that lead people to vote other political options. Indeed, Hjalmar Schacht used to say that Hitler's secret formula for political success was just «poverty and unemployment».[31]

c. Thirdly, the Nazi economic recovery shows the importance of savings. Any economic recovery needs investment, but it is also needs a parallel increase of savings in order to prevent the apparition of inflation. Therefore, Keynesian recipes against recessions are extremely dangerous.

BIBLIOGRAPHICAL REFERENCES

BÄRWALD, F. (1934): «How Germany Reduced Unemployment», *The American Economic Review*, vol. 24, n.º 4, december, pp. 617-630.

BAGUS, P. (2007): «Deflation. Is it really harmful? A theoretical analysis with two historical examples.», Doctoral Thesis, Universidad Rey Juan Carlos.

BALOGH, T. (1938): «The National Economy of Germany», *The Economic Journal*, vol. 48, n.º 191, september, pp. 461-497.

HAYEK, F. (2009): *The Pure Theory of Capital*, The Ludwig von Mises Insitute, Alabama.

— (1958): «The Ricardo Effect», in *Individualism and Economic Order*, The Chicago Press University, Chicago, pp. 220-244.

[31] Quoted by Weitz (1999), p. 131.

HUERTA DE SOTO, J. (2009): *Money, Bank Credit, and Economic Cycles*, The Ludwig von Mises Institute, Alabama.

— (2010): *Socialism, economic calculation and entrepreneurship*, Edward Elgar, Cheltenham, England.

KLEIN, B. (1948): «Germany's Preparation for War: a Re-examination», *The American Economic Review*, vol. 38. n.º 1, march, pp. 56-77.

KLEIN, J. (1973): «German Money and Prices, 1932-44», in *Studies in the Quantity Theory of Money*, ed. Milton Friedman, The University of Chicago Press, Chicago and London.

MISES, L. v. (1990): *Economic Calculation in the Socialist Commonwealth*, The Ludwig von Mises Institute, Alabama.

OVERY, R. (1975): «Cars, Roads, and Economic Recovery in Germany, 1932-8», *The Economic History Review*, New Series, vol. 28, n.º 3, august, pp. 466-483.

OVERY, R. (1979): «The German Motorisierung and Rearmament: A Reply», *The Economic History Review*, New Series, vol. 32, n.º 1, february, pp. 107-113.

— (1991): *The Nazi Economic Recovery*, Macmillan, Hong Kong.

RITSCHL, A. (2000): «Deficit Spending in the Nazi Recovery, 1933-1938», *Institute for Empirical Research in Economics*, Working Paper n.º 68, december.

SPENCELEY, G.F.R. (1979): «R.J. Overy and the Motorisierung: A Comment», *The Economic History Review*, New Series, vol. 32, n.º 1, february, pp. 100-106.

TEMIN, P. (1990): «Socialism and Wages in the Recovery from the Great Depression in the United States and Germany», *The Journal of Economic History*, vol. 50, n.º 2, june, pp. 297-307.

TURRONI, B. (1938): «The "Multiplier" in Practice: Some Results of Recent German Experience», *The Review of Economics and Statistics*, vol. 20, n.º 2, may, pp. 76-88.

WEITZ, J. (1999): *Hitler's Banker; Hjamar Horace Greeley Schacht*, Warner Books, Great Britain.

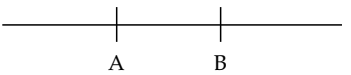
CAPITAL BUDGETING AND BUSINESS CYCLES

EDWARD W. FULLER

Every investment project is aimed at achieving some future goal. This goal can only be attained by employing scarce resources, like time. Every investment project entails foregoing other investment projects. It is impossible to undertake all investment projects simultaneously because resources are scarce. This means each investment project is subject to cost. The investment project may be unsuccessful in achieving the future goal and the entrepreneur may suffer a loss. On the other hand, investment projects are only undertaken because they are perceived as more valuable than their costs. Every investment project undertaken implies the possibility of earning a profit.

Investment projects take time. An investment project can be represented by a time line. Time *A* represents the beginning of the production process. Time *B* is the end of the production process. Line *AB* is called the *period of production*.

FIGURE 1



Present goods are scarce resources that can be consumed immediately. On the other hand, future goods cannot be consumed immediately. Future goods are only expected to be consumer goods at some point in the future. An investment project entails making an investment at time A and receiving a present good at time B.

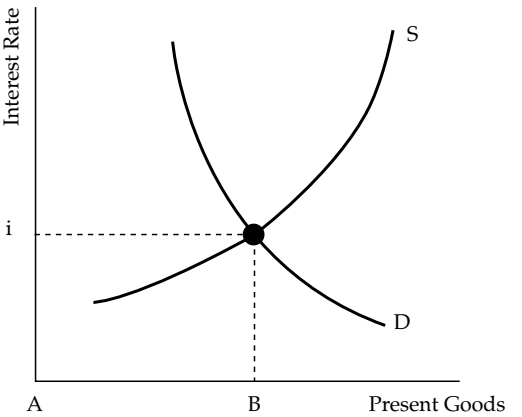
All else equal, present goods are more valuable than future goods.[1] Any good at time *A* is more valuable than the same good at time *B*. This is called time preference. Money is the present good par excellence. Therefore, future goods can be called future

Procesos de Mercado: Revista Europea de Economía Política
Vol. VIII, n.º 1, Primavera 2011, pp. 315 a 335

cash flows. All else equal, present money is more valuable than future money. This is called the time value of money.

The interest rate is the price of present goods in terms of future goods. The interest rate is the price which equates the amount of present goods provided by savers with the amount of present goods demanded by investors. Like all prices, the interest rate is determined by supply and demand. Savers are suppliers of present goods. The supply curve (S) is the quantity of present goods supplied at each interest rate. Factor owners (investors) are the demanders, or buyers, of present goods. The demand curve (D) is the quantity of present goods demanded at each interest rate. The intersection of the supply and demand curve determines the interest rate. The interest rate is determined by the supply and demand for present goods:[2]

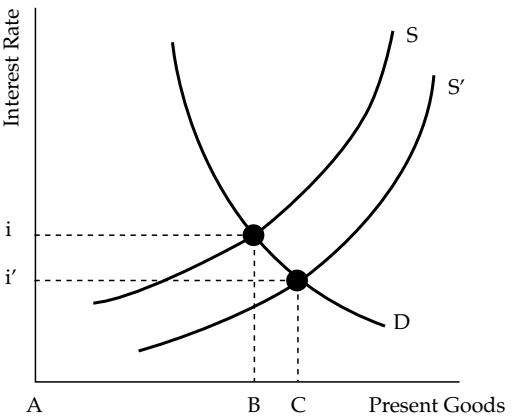
FIGURE 2



Changes in the supply and demand for present goods result in changes in the interest rate. An increase in savings constitutes an increase in the supply of present goods. An increase in the supply of present goods means the supply curve shifts right, from S to S′. The interest rate falls from i to i′ (Figure 3).

The lower interest rate after an increase in the supply of savings is a key market signal. It tells entrepreneurs that consumption has fallen and savings has increased. It indicates consumers desire

FIGURE 3

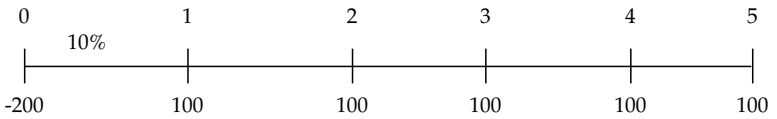


relatively more future goods and fewer present goods. This message is transmitted via the entrepreneur's capital budgeting techniques.

Entrepreneurs strive to buy factors at a low price and sell them at a high price. Entrepreneurs do this by allocating factors where they are undervalued compared to consumer desires. Entrepreneurs resort to economic calculation to determine which factors are undervalued compared to consumer desires. In other words, entrepreneurs use economic calculation to decide between alternative investment projects. Entrepreneurs decide between alternative investment projects by comparing forecasted cash flows. The aspect of economic calculation dealing with the future is called capital budgeting.[3] Capital budgeting is the entrepreneurial function which coordinates the actions of entrepreneurs with the demands of the consumers.

In capital budgeting, the entrepreneur doesn't know the precise time and size the future cash flows. Forecasting the size and timing of an investment project's future cash flows becomes a key entrepreneurial function. Entrepreneurs use time lines in economic calculation because many projects throw off multiple cash flows at various points in the future. For example, suppose an entrepreneur wants to buy a new machine for 200. He forecasts the new machine will yield cash flows of 100 per year for 5 years, with a 200 initial investment.

FIGURE 4



However, the value of each future cash flow is not 100 because of the time value of money. Entrepreneurs discount future cash flows to find the present capital value. Suppose the interest rate is 10%. In the example above the capital value (present value) is 374.12. The entrepreneur subtracts his initial 200 investment from the present value to find the Net Present Value (NPV).[4]

TABLE 1
PRESENT VALUE AT 10% INTEREST RATE

Time	*Cash Flow*	*Present Value*
1	100	90.48
2	100	81.87
3	100	74.08
4	100	67.03
5	100	60.65
Present value		**374.12**
Net Present Value		**174.12**

All else equal, the PV increases as interest rates fall. This occurs because the forecasted cash flows are discounted at a lower rate. For example, suppose the entrepreneur had only required a 5% rate of return. Notice the PV increases at the lower interest rate (Table 2).

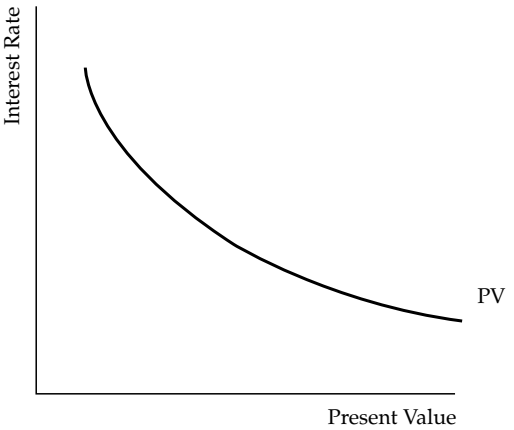
All else equal, the present value of an investment project increases as interest rates fall. More generally, the relationship between the present value and the interest rate can be illustrated with a simple diagram (Figure 5).

Suppose there is an increase in the supply of present goods and the interest rate falls. All else equal, this change in the interest

TABLE 2
PRESENT VALUE AT 5% INTEREST RATE

Time	*Cash Flow*	*Present Value*
1	100	95.12
2	100	90.48
3	100	86.07
4	100	81.87
5	100	77.88
Present value		**431.43**
Net Present Value		**231.43**

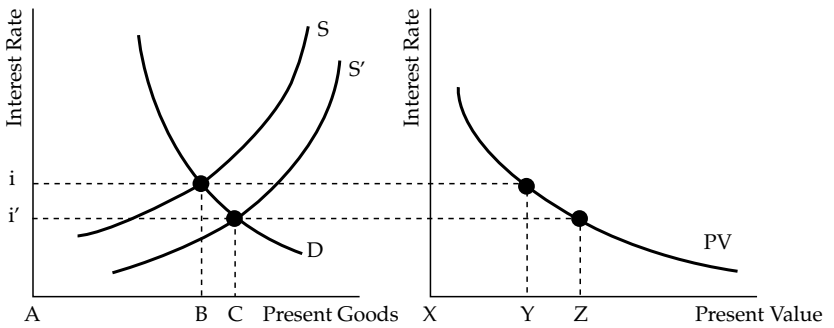
FIGURE 5



rate will cause the PV of investment projects to rise. Again, the PV increases because the future cash flows are discounted at a lower rate. This is represented by a move down the PV Curve from PV to PV′ (Figure 6).

The increase in savings means there has been a fall in consumption. These unconsumed resources are freed up for investment purposes. The increase in present values encourages entrepreneurs to undertake more projects. Projects that were not profitable at the higher interest rate are now profitable.

FIGURE 6



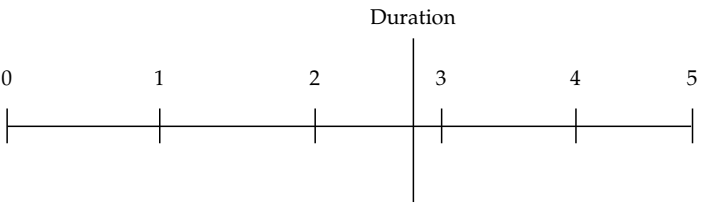
A fall in the interest rate also encourages entrepreneurs to take on different types of projects. More specifically, the first projects undertaken are always the shortest and most productive projects available. So any increase in savings must lead to investment in longer and more productive investment projects. Longer production processes make it possible to produce more output with the same input. Longer production processes also make it possible to produce products that couldn't be produced. This can be explained using a capital budgeting technique called duration.[5]

Duration is the weighted average time the entrepreneur must wait to receive present goods from his investment project. Duration is the weighted average lifetime of a set of future cash payments.[6] It is the weighted average of the maturities of future cash flows. Since an investment project is a set of future cash flows, duration can also be called the weighted average life of an investment project. Project duration is the effective maturity of an investment project.[7] In short, project duration is the effective period of production (Figure 7).

The duration of an annuity style investment project is defined by the following expression.[8] The duration of an annuity style project is a function of the project term and interest rate:

$$D = \frac{e^{i}(e^{it} - 1) + t(1 - e^{i})}{(e^{i} - 1)(e^{it} - 1)}$$

FIGURE 7



Where:

D = Duration of an annuity
t = Project years
i = interest rate

Duration is used in capital budgeting as a measure of interest rate sensitivity.[9] The following formula shows how the present value changes given a change in interest rates:[10]

$$\%\Delta PV = -D * \Delta i$$

Where:

$\%\Delta PV$ = percentage change in present value
D = Duration
i = interest rate

All else equal, duration increases as the interest rate falls.[11] This relationship can be illustrated[12] using the two projects above. Recall the interest rate in the first example was 10%. At this rate, the project's duration is 2.80[13] (Table 3).

Duration indicates the effective end of the period of production for an investment project. A time line can be used to evaluate duration. In this example, time 0 is the beginning of the investment project. Time 2.8 is the investment project's effective period of production (Figure 8).

Now suppose the interest rate falls to 5%. At the new lower rate of 5%, the project's duration increases to 2.9[14] (Table 4).

TABLE 3
DURATION AT 10% INTEREST RATE

Time	*Cash Flow*	*Present Value*	*Weight*	*Weighted Life*
1	100	90.48	24.19%	0.24
2	100	81.87	21.88%	0.44
3	100	74.08	19.80%	0.59
4	100	67.03	17.92%	0.72
5	100	60.65	16.21%	0.81
Total	500	374.12	100.00%	**2,80**

FIGURE 8

TABLE 4
DURATION AT 5% INTEREST RATE

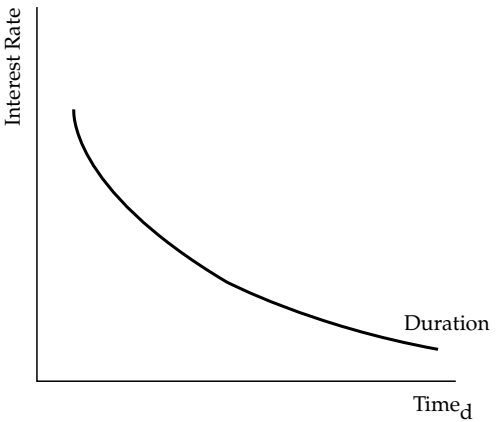
Time	*Cash Flow*	*Present Value*	*Weight*	*Weighted Life*
1	100	95.12	22.05%	0.22
2	100	90.48	20.97%	0.42
3	100	86.07	19.95%	0.60
4	100	81.87	18.98%	0.76
5	100	77.88	18.05%	0.90
Total	500	431.43	100.00%	**2,90**

The effective period of production increases to 2.9 at a 5% interest rate, as shown on the following time line:

FIGURE 9

This example demonstrates that duration is inversely related to the interest rate: other things equal, duration increases as the interest rate decreases. The relationship between interest rates and duration can be expressed with the following diagram. The shape of the duration curve is defined by the expression D above. The duration curve slopes downward to the right, and becomes more elastic at lower interest rates:

FIGURE 10



The duration diagram shows the effective period of production for an annuity style investment project at different interest rates. Time$_d$ is the x-axis. The x-axis is in fact a time line, like the time lines above (Figure 11).

The duration diagram curve shows the duration of an investment project at different interest rates. In other words, the curve indicates the effective period of production for an investment project at each interest rate. For instance, the effective period of production at i is line AB. The effective period of production at the lower interest rate i' is line AC (Figure 12).

Duration has an additive property,[15] so it's possible to combine the duration diagram with the aggregate time market diagram (Figure 13).

An increase in savings causes the supply curve of present goods curve to shift right to S'. The interest rate falls from i to i'.

FIGURE 11

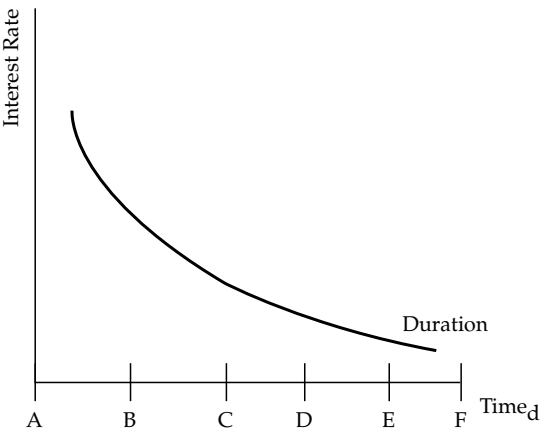
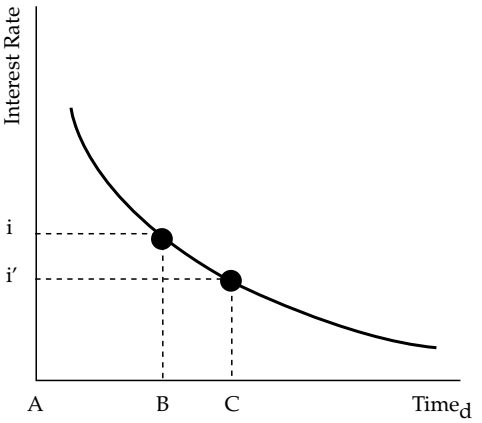


FIGURE 12



Duration increases, as represented by a move down the Duration curve from D to D′. In short, an increase in savings will lead to an increase in the effective period of production of society's investment projects[16] (Figure 14).

The present goods provided by savers increases from line AB to AC. Entrepreneurs accordingly increase project durations from time XY to XZ. Entrepreneurs allocate factors where they are

FIGURE 13

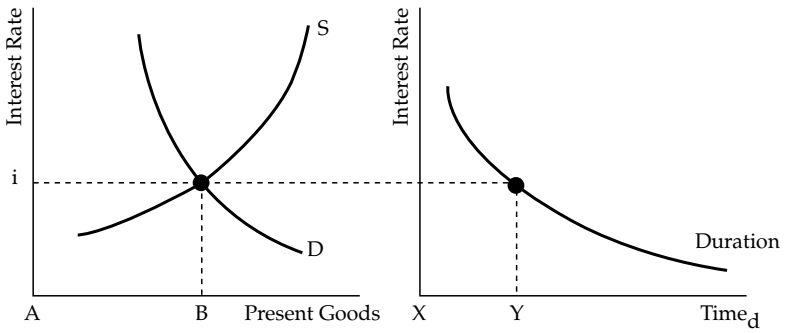
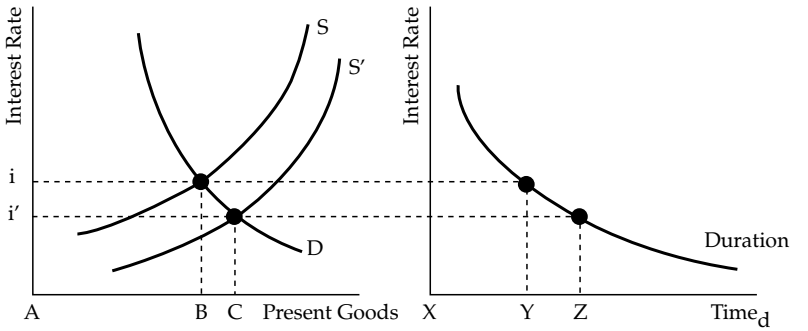


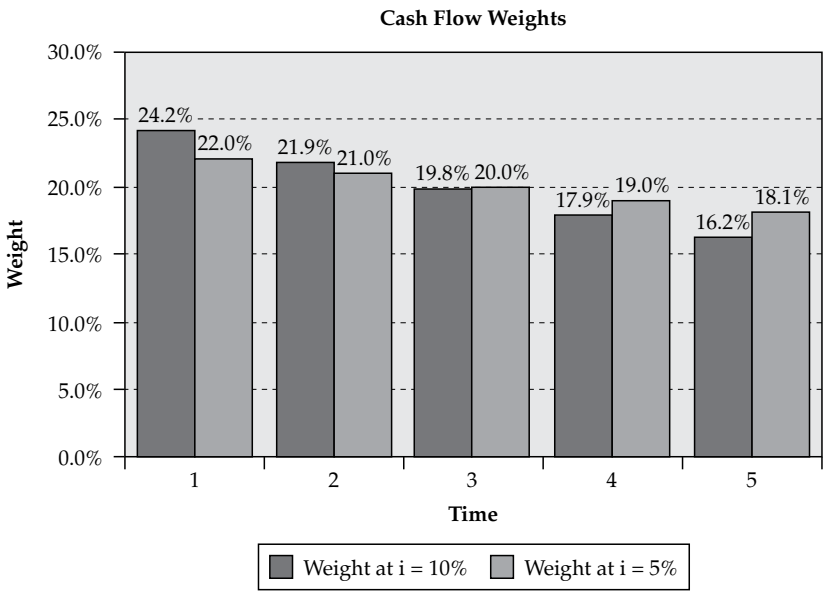
FIGURE 14



undervalued compared to consumer desires. When interest rates are low, capital budgeting techniques indicate to entrepreneurs that factors with longer durations are undervalued compared to consumer desires. Entrepreneurs are incentivized to take on longer duration projects at lower interest rates.[17] An increase in savings will lead to a reduction in the demand for factors early on the time line and increase in the demand for factors late on the time line.[18]

This phenomenon is explained by examining the duration computations. The weights accorded to each cash flow are influenced by the interest rate. Each cash flow's weight is the present value of the cash flow divided by the total present value of the project. The first cash flow has a weighting of 24.19% at a 10% interest rate. The fifth cash flow has a weight of 16.21% (Figure 15).

FIGURE 15

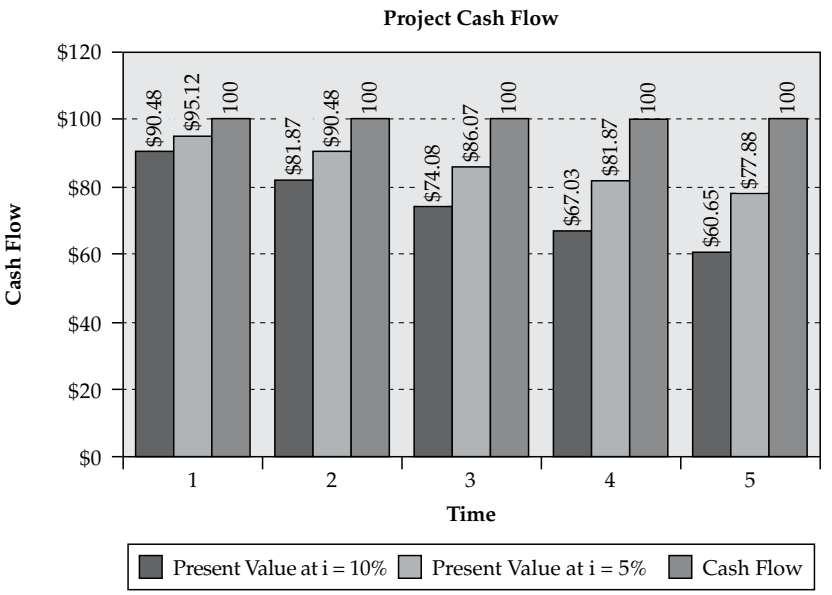


In contrast, the weight of the first cash flow falls when the interest rate drops to 5%. The weight of the first cash flow falls from 24.19% to 22.05%. The weight of the fifth cash flow increases from 16.21% to 18.05%. The early weights fall and late weights rise as interest rates fall because distant cash flows are more interest rate sensitive than early cash flows. This can be demonstrated by examining the present value of each cash flow at the two rates (Figure 16).

Distant cash flows become relatively more important when interest rates are low. The present value of the first cash flow increases by approximately 5% when interest rates fall from 10% to 5%. However, the present value of the fifth cash flow increases by approximately 25%. Therefore, the present value of the fifth cash flow becomes a larger percentage of the entire projects present value.

Duration's sensitivity characteristic reveals how the interest rate allocates scarce resources across time. The interest rate acts as a key market signal by incentivizing entrepreneurs to undertake

FIGURE 16



projects consistent with consumer desires.[19] It tells entrepreneurs that consumers have reduced consumption and increased savings. An increase in project duration tells entrepreneurs that consumers want relatively more future goods and relatively fewer present goods. Entrepreneurs will respond by taking on longer duration investment projects. Entrepreneurs can take on longer duration projects because savers have provided additional present goods. These present goods provided by savers sustain entrepreneurs and laborers during the longer production process.

Socialism is an institutionalized system of property title redistribution. On the other hand, capitalism is a system of property title recognition.[20] Private property is necessary for the formation of market prices. Private property allows for voluntary exchange. Each voluntary exchange results in an exchange ratio. For instance, suppose 200 is exchanged for 1 machine. The exchange ratio is:

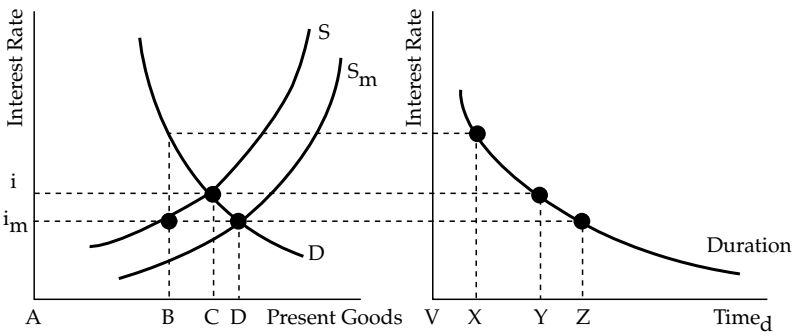
$$\text{Exchange Ratio} = 200/\text{Machine}$$

This exchange ratio is a market price. The price of 1 machine is 200. These market prices can be used by entrepreneurs in economic calculation.

Capital budgeting is impossible without private property. Voluntary exchange cannot occur without private property. As a result there are no exchange ratios; there are no market prices. It is impossible to forecast the future cash flows from each investment project because there are no market prices. Capital budgeting techniques like NPV and Duration can't be conducted without forecasting cash flows. It is impossible to rank investment projects without private property. The grading function provided by economic calculation cannot exist without private property.[21]

Credit expansion is an increase in the money supply where the new money enters through loan markets. Banks expand credit by creating new demand deposits (checking accounts) unbacked by real savings.[22] Demand deposits are money, and money is the present good par excellence. Credit expansion therefore constitutes an increase in the supply of present goods. Credit expansion causes the supply curve to shift right from S to S_m.[23] The original Supply curve still represents the amount of real savings.

FIGURE 17



Credit expansion encourages entrepreneurs to undertake more projects. The new level of investment increases from line AC to AD. Not only do entrepreneurs take on more projects, they undertake projects with different time profiles. Entrepreneurs

are incentivized to undertake longer duration projects at lower rates. This is represented by an increase in project duration from line VY to line VZ.

However, consumers do not demand more future goods and have not provided the necessary present goods entrepreneurs need to complete longer duration projects. In fact, the quantity of real savings supplied falls at the artificially low rate.[24] The original amount of real savings provided by savers is line AC. The new quantity of real savings supplied by savers falls to line AB. Savers originally provide enough real savings to sustain entrepreneurs and laborers for time VY. Now savers only supply a quantity of savings for time VX.

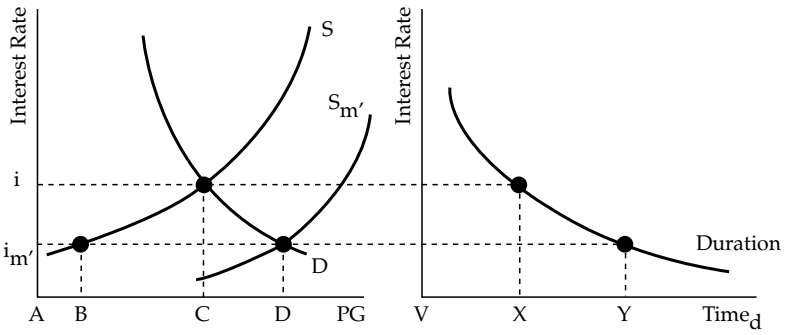
The level of investment is greater than the level of real savings. Line BD is the shortage of real savings.[25] Consumers want to receive present goods in time VX, but entrepreneurs are undertaking projects to provide present goods at time VZ. The time discrepancy between consumer desires and entrepreneur's investment projects is XZ.

The bust occurs when entrepreneurs realize the shortage of present goods. Entrepreneurs scramble to acquire the present goods required to complete their longer duration projects. This increase in the demand for present goods causes the interest rate to rise. Entrepreneurs realize the projects they entered were not undervalued compared to consumer desires. In fact, capital budgeting techniques now tell entrepreneurs that short duration projects are now undervalued compared to consumer desires. Entrepreneurs must realign their activities with consumer desires. This necessarily entails liquidating malinvestments and reallocating any salvageable resources to profitable projects. Entrepreneurs must liquidate their malinvestments at a loss.[26] These projects must be liquidated at a loss.[27]

The boom is a period of mass resource misallocation. Artificially low interest rates distort economic calculation thereby causing mass entrepreneurial error.[28] The bust is a period where entrepreneurs realign their activity with the desires of consumers. The bust is a necessary adjustment period in which malinvestments are liquidated. Credit expansion distorts economic calculation thereby causing the boom bust cycle.

Duration can be used to illustrate the effects of additional credit expansion during an economic bust.

FIGURE 18



The duration curve is more elastic at lower interest rates. Additional credit expansion during a bust incentivizes entrepreneurs to undertake projects with even longer effective periods of production. This means entrepreneurs take on even more interest rate sensitive projects. The losses in more interest rate sensitive projects will be magnified when interest rates inevitably rise.[29] The liquidation phase is exacerbated as losses are enhanced when interest rates finally rise.[30] In short, additional bouts of credit expansion during a bust only encourage more malinvestment and delay recovery.

The interest rate allocates scarce resources across time. Capital budgeting techniques used in economic calculation are entrepreneurial indicators. Tools like Net Present Value and Duration transmit the desires of consumers to entrepreneurs. The interest rate plays a vital role in these capital budgeting techniques. Artificially low interest rates caused by credit expansion skews the results of the entrepreneur's capital budgeting process. Credit expansion inevitably results in the mass misallocation of resources.

NOTAS

[1] If this were not true, capital assets like land would have infinite capital values.

[2] For more on the Time Market Diagram, see: Rothbard, Murray N. *Man, Economy, and State: A Treatise on Economic Principles; with Power and Marke*. Auburn: Ludwig von Mises Institute, 2004, p. 388)

> «the market of present and future goods, in which the interest rate is determined, *consists of society's entire structure of productive stages*, in which savers or capitalists give up immediate consumption and offer present goods to owners of the primary or original factors of production (workers and owners of natural resources) and to owners of capital goods, in exchange for the full ownership of consumer (and capital) goods of a supposedly higher value once the production of these goods has been completed in the future.» (Huerta de Soto, J. *Money, Bank Credit, and Economic Cycles*. Auburn: Ludwig von Mises Inst., 2006, p. 286).

[3] «Economic calculation is either an estimate of the expected outcome of future action or the establishment of the outcome of past action.» (Mises, Ludwig von. *Human Action: A Treatise on Economics*. Auburn, Ala: Ludwig Von Mises Institute, 1998, p. 211).

[4] The Net Present Value (NPV) is the sum of the present values of all cash inflows and outflows from an investment project. Entrepreneurs will generally undertake projects with a positive NPV and reject projects with a negative NPV. However, the NPV does not measure the value of an investment project. The NPV can be used to rank or grade projects, but it cannot be used to measure value. The net present value (NPVA) of an annuity style investment project is:

$$NPVA = \frac{f(1 - e^{-i*t})}{e^{i} - 1} - C$$

Where:

f = Cash Flow	i = interest rate
t = Project years	C = Initial cost

$$NPV(10\%) = \frac{10_0(1 - e^{-.1*5})}{e^{.1} - 1} - 200 = 174.12$$

$$NPV(5\%) = \frac{10_0(1 - e^{-.05*5})}{e^{.1} - 1} - 200 = 231.43$$

[5] Macaulay, Frederick R. *Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields, and Stock Prices in the United States Since 1856*. New York: Columbia University Press, 1938.

[6] For more on duration, see: Das, Sanjiv R. *Derivatives: Principles and Practice*. New York: McGraw-Hill Irwin, 2011, p. 141 and 150; Hull, John. *Options, Futures, and Other Derivatives*. Upper Saddle River, N.J: Pearson/Prentice Hall, 2006, p. 89.

[7] Stickney, Clyde. «Duration and Risk Assessments in Capital Budgeting». *The Accounting Review*, vol. 54, n.º 1 (Jan., 1979): 180-188.

[8] *PV* is the present value of a future cash flow. *PV'(i)* is the first deriviative of the *PV(i)*. *Note MPV'* is just a function of time.

$$PV = f\, e^{-it}$$

$$PV'(i) = -tf\, e^{-it}$$

$$D(i) = \frac{PV'(i)}{-PV(i)} = \frac{-tf\, e^{-it}}{-f\, e^{-it}} = t$$

$$D = t$$

Similary, the present value of an annuity is *PVA*. *PVA(i)* is the first derivative of *PVA(i)*. *D(i)* is the duration of an annuity:

$$PVA = \frac{f(1 - e^{-it})}{e^{i} - 1}$$

$$PVA'(i) = \frac{(tf\, e^{-it})(e^{i} - 1) + (f - f\, e^{-it})(e^{i})}{(e^{i} - 1)^2}$$

$$D'(i) = \frac{PVA'(i)}{-PVA(i)}$$

$$D = \frac{e^{i}(e^{it} - 1) + t\,(1 - e^{i})}{(e^{i} - 1)(e^{it} - 1)}$$

Thanks to Robert Whitten. Any mistakes are the author's alone.

[9] Duration, as a measure of interest rate sensitivity, must be corrected for Convexity over large changes in interest rates.

[10] For example, the present value of an investment project will increase by 10% if project duration is 10 and interest rates fall by 1 percentage point. Suppose project duration is 30 and interest rates fall by 1 percentage point. The present value of the project will increase by 30%. Entrepreneurs use duration to measure how changes in interest rates will affect the value of their assets and liabilities, and therefore their capital.

[11] There are 5 rules regarding duration:

1. The duration of a single cash flow project is equal to the time to maturity
2. All else equal, when interest rates rise project duration falls.
3. All else equal, the longer the term to maturity of a project the greater its duration.
4. All else equal, the higher the project cash flows the shorter the bond's duration.
5. Duration is additive: The duration of a portfolio of projects is the weighted average of the durations of the individual projects.

[12] The duration of a zero coupon bond is equal to the bond's maturity. For example, a one year zero coupon bond has duration of one, and a five year zero coupon bond has duration of five. This means if interest rates increase by one percentage point, the present value of the one year zero coupon will fall by 1%. The price of the five year zero coupon bond will decrease by 5%.

[13]

$$D(10\%) = \frac{e^{.1}(e^{.1*5} - 1) + t(1 - e^{.1})}{(e^{.1} - 1)(e^{.1*5} - 1)} = 2.8$$

[14]

$$D(5\%) = \frac{e^{.05}(e^{.05*5} - 1) + t(1 - e^{.05})}{(e^{.05} - 1)(e^{.05*5} - 1)} = 2.9$$

[15] Duration's additive property is useful because the duration of multiple projects can be easily calculated from the durations of the individual projects. The duration of multiple (or society's) investment projects is the weighted average of the durations of the individual projects. The weights are equal to each project's percentage of the entire portfolio in present value terms. Suppose an entrepreneur has two projects in his portfolio. Project A has a duration of 10 year and represents 40% of his project portfolio. Project B has a duration of 20 years and represents 60% of his project portfolio. The duration of the two project portfolio is:

$$\textit{Portfolio Duration} = (10 * .4) + (20 * .6) = 16 \textit{ years}$$

[16] «A reduction of the rate of interest on loans must necessarily lead to a lengthening of the average period of production.» (Mises, Ludwig von. *The Theory of Money and Credit*. Liberty Classics edition. Indianapolis: Liberty Fund, 1981, p. 400).

[17] «The rate of originary interest directs the investment activities of the entrepreneurs. It determines the length of waiting time and of the period of production in every branch of industry» (Mises, Ludwig von. *Human Action: A Treatise on Economics*. Auburn, Ala: Ludwig Von Mises Institute, 1998, p. 529).

[18] Entrepreneurs respond to increased savings in two ways. First, they reduce later stage investment. This reduction in late stage investment is called the Derived Demand Effect. Second, the lower interest rates also encourage early stage investment. This is called the Time Discount Effect. The Derived Demand Effect and Time Discount Effect are both captured using duration. A fall in interest rates leads to an increase in the demand for factors late on the duration timeline and a decrease in demand for factors early on the duration time line.

[19] «The more plentiful the savings, i.e., the greater the quantity of present goods sold or offered for sale, other things being equal, the lower their price in terms of future goods; and consequently, the lower the market rate of interest. This indicates to entrepreneurs that more present goods are available, which enables them to increase the length and complexity of the stages in their production processes, making these stages more productive» (Huerta de Soto, J. *Money, Bank Credit, and Economic Cycles*. Auburn: Ludwig von Mises Inst, 2006, p. 290).

[20] Hoppe, Hans-Hermann. *A Theory of Socialism and Capitalism: Economics, Politics, and Ethics*. Boston: Kluwer Academic Publishers, 1989.

[21] «Where there is no market there is no price system, and where there is no price system there can be no economic calculation» (Mises, Ludwig von. *Socialism: An Economic Sociological Analysis*. Indianapolis: Liberty Classics, 1981, p. 113).

[22] The fragility of fractional reserve banking systems can be illustrated using duration Gap Analysis. The duration of a demand deposit is zero. Fractional reserve bank liabilities are by definition shorter duration than bank assets.

Suppose the duration of a bank's assets is 10 years and the duration of the bank's liabilities is 0. Suppose there are 100 million in assets and 90 million in liabilities. With a 2 percentage point increase in interest rates, the capital value of the bank's assets will decrease by 20% (-2% x 10=-20%), or 20 million. The capital value of the bank's liabilities will not fall. The bank now has 80 million in assets and 90 million in liabilities. Bank equity is negative 10 million and the bank is bankrupt.

Gap Analysis indicates that it is impossible to completely mitigate the interest rate risk associated with fractional reserve banking. Fractional reserve banks create demand deposits when they make loans. This means they create zero duration liabilities when they make longer duration loans. Other things equal, a bank is always more interest rate sensitive after engaging in fractional reserve banking. Fractional reserve banking creates interest rate risk that can be sliced and diced, but never destroyed.

«Another way of looking at the essential and inherent unsoundness of fractional reserve banking is to note a crucial rule of sound financial management—one that is observed everywhere *except* in the banking business. Namely, *that the time structure of the firm's assets should be no longer than the time structure of its liabilities*.» (Rothbard, Murray N. *The Mystery of Banking*. New York, N.Y: Richardson & Snyder, 1983, p. 10).

For more on Duration Gap Analysis, see: Mishkin, Frederic S. *The Economics of Money, Banking, and Financial Markets*. 7th edition, Boston: Pearson, 2004, p. 222.

[23] «Superficially, it seems that credit expansion greatly increases capital, for the new money enters the market as equivalent to new savings for lending. Since the new "bank money" is apparently added to the supply of savings on the credit market, businesses can now borrow at a lower rate of interest» (Rothbard, Murray N. *Man, Economy, and State: A Treatise on Economic Principles; with Power and Market : Government and the Economy*. Auburn: Ludwig von Mises Institute, 2004, p. 993).

[24] «Some resources are bid away from the intermediate and relatively late stages of production and into the early stages. At the same time, income earners, for whom that same lower interest rate discourages saving, spend more on consumption… the restructuring cannot actually be completed. The boom is unsustainable; the changes in the intertemporal structure are self defeating. Resource scarcities and a continuing high demand for current consumption eventually turn boom into bust.» (Garrison, Roger W. *Time and Money: The Macroeconomics of Capital Structure*. London: Routledge, 2001, p. 72).

[25] «Despite the fact that there has been no increase of intermediate products and there is no possibility of lengthening the average period of production, a rate of interest is established in the loan market which corresponds to a longer period of production; and so, although it is in the last resort inadmissible and impracticable, a lengthening of the period of production promises for the time to be profitable. But there cannot be the slightest doubt as to where this will lead. A time must necessarily come when the means of subsistence available for consumption are all used up although the capital goods employed in production have not yet been transformed into consumption goods. This time must come all the more quickly inasmuch as the fall in the rate of

interest weakens the motive for saving and so slows up the rate of accumulation of capital. The means of subsistence will prove insufficient to maintain the labourers during the whole period of the process of production that has been entered upon.» (Mises, Ludwig von. *The Theory of Money and Credit*. Liberty Classics edition. Indianapolis: Liberty Fund, 1981, p. 401).

[26] «This situation is very similar to the one in which our Robinson Crusoe would find himself if, having saved a basket of berries large enough to permit him to spend a maximum of five days producing a capital good without having to devote himself to the collection of more berries, *through an error in calculation* were to believe that this amount of savings would allow him to undertake the construction of his cabin. After five days spent just digging the foundations and gathering materials, he would have consumed all of his berries and would therefore be unable to complete his illusory investment project» (Huerta de Soto, J. *Money, Bank Credit, and Economic Cycles*. Auburn: Ludwig von Mises Institute, 2006, p. 377).

[27] «It is not practicable to transfer all the production goods from those uses that have proved unprofitable into other avenues of employment; a part of them cannot be withdrawn and must therefore either be left entirely unused or at least be used less economically. In either case there is a loss of value.» (Mises, Ludwig von. *The Theory of Money and Credit*. Liberty Classics edition. Indianapolis: Liberty Fund, 1981, p. 400).

[28] «The drop in interest rates falsifies the businessman's calculation. Although the amount of capital goods available did not increase, the calculation employs figures which would be utilizable only if such an increase had taken place. The result of such calculations is therefore misleading. They make some projects appear profitable and realizable which a correct calculation, based on an interest rate not manipulated by credit expansion, would have shown as unrealizable. Entrepreneurs embark upon the execution of such projects. Business activities are stimulated. A boom begins.» (Mises, Ludwig von. *Human Action: A Treatise on Economics*. Auburn: Ludwig Von Mises Institute, 1998, p. 550).

[29] «entrepreneurs experience resource scarcities that are more constraining than was implied by the pattern of wages, prices, and interest rates that characterized the early phase of the boom. Here, changing expectations are clearly endogenous to the process. The bidding for increasingly scarce resources and the accompanying increased demands for credit put upward pressure on the interest rate.» (Garrison, Roger W. *Time and Money: The Macroeconomics of Capital Structure*. London: Routledge, 2001, p. 72).

[30] «Capital goods prices will increase initially relative to consumer goods prices, but once the public's underlying time preference rate begins to reassert itself, a systematic shortage of consumer goods will arise. Accordingly, the interest rate will adjust upward, and it is now consumer goods prices which rise relative to capital goods price, requiring the liquidation of part of the investment as unsustainable malinvestment» (Hoppe, Hans-Hermann. *The Economics and Ethics of Private Property: Studies in Political Economy and Philosophy*. Auburn: Ludwig von Mises Institute, 2006, p. 199).

ARTIFICIAL INTELLIGENCE, DYNAMIC EFFICIENCY AND ECONOMICS

VINCENT WOLTERS*

I
INTRODUCTION

In this work I will lend support to the theory of «dynamic efficiency», as outlined by Prof. Huerta de Soto in *The Theory of Dynamic Efficiency* (2010a). Whereas Huerta de Soto connects economics with ethics, I will take a different approach. Since I have a background in Artificial Intelligence (A.I.), I will show that this and related fields have yielded insights that, when applied to the study of economics, may call for a different way of looking at the economy and its processes.

At first glance, A.I. and economics do not seem to have a lot in common. The former is thought to attempt to build a human being; the latter is supposed to deal with depressions, growth, inflation, etc. That view is too simplistic; in fact there are strong similarities.

First, economics is based on (inter-)acting individuals, i.e. on human action. A.I. tries to understand and simulate human (and animal) behavior. Second, economics deals with information processing, such as how the allocation of resources can best be organized. A.I. also investigates information processing. This can be in specific systems, such as the brain, or the evolutionary process, or purely in an abstract form. Finally, A.I. tries to answer more philosophical questions like: what is intelligence? What is a mind? What is consciousness? Is there free will? These topics play a less prominent role in economics, but are sometimes touched upon, together with the related topic of the «entrepreneurial function».

* Master in Economics of the Austrian School and Ph. D. candidate of the King Juan Carlos University of Madrid.

Procesos de Mercado: Revista Europea de Economía Política
Vol. VIII, n.º 1, Primavera 2011, pp. 337 a 350

II
THE FIRST PARADIGM: THE STATIC APPROACH

The paradigm that was dominant in the early days of A.I. is static in nature. Reaching a solution is done in different steps. First: gathering all necessary information. Second: processing this information. Finally: the outcome of this process, a clear conclusion. Each step in the process is entirely separate. During information gathering no processing is done, and during processing, no new information is added. The conclusion reached is final and cannot change later on. Logical problems are what is mostly dealt with, finding ways in which a computer can perform deductions based on the information that is represented as logical statements. Other applications are optimization problems, and so-called «Expert Systems», developed to perform the work of a judge reaching a verdict, or a medical doctor making a diagnosis based on the symptoms of the patient. This paradigm is also called «top-down», because information flows to a central point where it is processed, or «symbolic processing», referring to deduction in formal logic.[1]

In economics there is a similar paradigm, and it is still the dominant one. This is the part of economics that deals with optimization of resources: given costs and given prices, what is the allocation that will lead to the highest profit? Also belonging to this paradigm are the equilibrium models. Demand and supply curves are supposed to be knowable and unchangeable, and the price is a necessary outcome. The culmination is central planning that supposes all necessary information, such as demand and supply curves and available resources to be known. Based on this, the central planner determines prices.

While in economics this paradigm is still the one most adhered to, in A.I. there has been, at least partially, a paradigm shift sometime around the beginning of the nineties. For problems that can easily be fitted into a logical representation, the static paradigm is quite successful. Unfortunately, there are other problems that cannot so easily be solved this way.

---

[1] In linguistics, Noam Chomsky's generative grammar falls within this same, static paradigm.

III
THE SECOND PARADIGM: THE DYNAMIC APPROACH

There are problems that cannot be handled well within the static, top-down paradigm. Sometimes information is not available, or at least not in a form that can easily be represented in a logical structure. This makes the step of information gathering difficult if not impossible. If these difficulties are overcome, then the processing step is not straightforward either. What to do with uncertain information, or what if the amount of information is so huge, that processing becomes a never-ending task? (More on this in paragraph IV «Complexity, Chaos and Calculation»). Finally, in many cases information is created or changed continuously. A final decision, once reached, is immediately outdated and obsolete. An important class of problems where these difficulties are encountered are those within or in interaction with the real-world, instead of being confined to a closed domain.

An early attempt to cope with uncertain information is fuzzy logic. This takes into account the confidence in or probability of a piece of knowledge. Fuzzy logic still belongs to the static paradigm, since it basically uses logical deduction. It does not serve well to confront other difficulties like those outlined above.

Since it is the real-world problems that show these difficulties, it makes sense to find inspiration in how they are dealt with in nature. Brain research has given rise to artificial neural networks. Evolutionary biology has inspired genetic algorithms and later evolutionary programming. These techniques have several things in common. Information is not represented in a formal, logical structure, but is disperse and inarticulate. It is constantly being fed to the system and can change continuously. Processing is done in a parallel way, simultaneously with the feeding of input to the system. The «conclusion» is not a static, unchanging outcome, but rather a dynamic, adapting behavior. This paradigm is also called «subsymbolic», because information is not represented by symbols, or «bottom-up», since the resulting behavior arises from the interaction of all the elements instead of from a centralized process.

IV
COMPLEXITY, CHAOS AND CALCULATION

There are several theoretical considerations as to why a static approach may sometimes not be feasible, suggesting that a more dynamic approach may lead to better results. Below are some insights that indicate that straightforward logical deduction or mathematical calculation may not always be possible.

1. The Combinatorial Explosion

A specific obstacle to the solution of seemingly simple problems is the so-called «combinatorial explosion». The difficulty arises when variables can be combined in many different ways. With only a few variables, this can already lead to an enormous amount of computing time necessary to solve the problem. An example of such a problem is the «Travelling Salesman Problem»:[2] a salesman has to visit many cities and wants to find the shortest route. It turns out this problem starts to take years of processing time with only a few cities, becoming exponentially harder for each city that is added. This shows that for systems containing only a handful of variables it may nevertheless in practice be impossible to compute its optimal solution.

2. Complexity and Nonlinear Systems

Complexity can arise in systems that consist of elements that are themselves following simple rules. The combined behavior can be sufficiently complex as to be unpredictable in practice. This combined behavior may lead to patterns, or «emergence»: higher level order, not easily reducible to the underlying elements. Complex systems are characterized by feedback loops. The behavior of one element has an effect on others, and those latter elements in turn

[2] One of the first mathematicians to study and formalize the Traveling Salesman Problem was Karl Menger, son of economist Carl Menger.

affect the former element. Because of this dynamic feedback mechanism, complex systems are often represented by nonlinear equations. E.g. in population biology these equations are used to describe how the number of animals in a group changes over time.

3. Chaotic Systems

Chaotic systems are a special class of nonlinear systems, containing feedback loops such that the outcome of the system serves as input. Chaotic systems are not random, but instead completely deterministic functions. The main lesson of chaos theory is that determinism does not imply predictability. The reason is that chaotic systems are extremely dependent on initial settings. This is the «Butterfly Effect»: an infinitesimal small difference can lead to a very different outcome of the system. The system may show more or less regular patterns, or always have an outcome between certain bounds. The exact state will, however, not be predictable within these limits. Since initial settings in the real world cannot be known to such a precision, in principle all real-life chaotic systems are unpredictable. The weather is a prime example of a system containing patterns but nevertheless inherently chaotic and therefore essentially unpredictable.[3] Other such systems, containing nonlinear feedback loops (possibly) resulting in chaotic behavior are the brain, the evolutionary process or the economy.

4. Economic Calculation

The abovementioned items indicate that calculation is not always possible, and even if calculations can be made, then they may not be reliable for any practical purpose. Economic calculation, as under central planning, suffers from the same difficulties. Austrian School economists such as Mises and Hayek have argued against

[3] One of the founders of chaos theory was mathematician and meteorologist Edward Lorenz.

the possibility of economic calculation under central planning. One of the arguments has to do with the discovery of information and will be explained in more detail in section VI.1 «Entrepreneurial Discovery». Their main arguments related with computation are: 1) people's preferences are subjective and unpredictable, therefore they cannot be known; 2) economic information is disperse and tacit, therefore it cannot easily be represented in a form suitable for calculation; 3) even if all information could be gathered, it would be too much to be processed in any realistic period of time; 4) all people can change their mind and information can change constantly. Due to this, any economic calculation would immediately be outdated as soon as it has finished.

Each of these arguments can be compared to difficulties arising from complexity and chaos.

1) Human unpredictability. This is of course a complicated subject, where no clear answer exists. It is closely related to the question of whether free will exists. If so, then people are clearly unpredictable. The notion of free will, however, is not very satisfactory, since there is no known mechanism as to how it would work. A different way of explaining unpredictability of people's preferences is by referring to the complex structure and therefore chaotic behavior of the brain. If the brain is indeed chaotic, then no person can be fully predicted by computation.
2) Disperse and tacit information. This makes central processing of information difficult if not impossible. It is a characteristic of complex systems that information is spread throughout the system instead of being in one specific location.[4]
3) Too much information. The «combinatorial explosion» would already make economic calculation impossible for only a small population, given that the number of combinations of different resource allocations and preferences is enormous.
4) Changing information. This adds to the combinatorial explosion and puts extra time constraints on the performance of the central planner.

[4] The ideas of Friedrich von Hayek on disperse information in the economy and his work in other fields have greatly stimulated the study of complex systems.

Complex economies in advanced societies do manage to allocate resources in an efficient way, so in that sense one can say the economic calculation problem has been solved. How this is done and what lessons can be learnt from A.I. will be explained in paragraph VI: «Dynamic Efficiency».

V
SEARCH SPACE

1. Search Space

The concept of a search space can be useful when thinking about situations in which a solution to a problem has to be found. The search space can be defined in several ways.

It can be mathematically defined by an equation. Alternatively, given a space made up of axes representing variables, it can be seen as the subspace that complies with certain constraints on the variables. In general terms, the search space contains all possible solutions to a given problem. In this sense «solution» does not mean «perfect solution», but rather a possible attempt at solving a problem, that may or may not have merit. Each point in the search space corresponds to a possible solution, and has an explicit or implicit value according to how well the particular combination of variables deals with the problem at hand. Searching for solutions to a problem can be seen as going through the search space in order to find the solution with the highest value. There are different search algorithms to do so. There is no perfect search algorithm; its performance depends on the characteristics of the specific search space. Within A.I. much research is dedicated to finding and improving search algorithms for different situations. The more complex a search space is, the more difficult it is to find an algorithm that reaches a satisfactory solution within reasonable time. Algorithms developed within the static paradigm don't cope well with highly nonlinear, complex search spaces.

2. Fitness

Evolution theory in biology teaches that those life forms survive that have the highest fitness. In the context of a search space, fitness refers to the value attached to a certain solution. Within the dynamic paradigm, biological evolution has inspired researchers to develop genetic algorithms. These are search algorithms that start with randomly chosen solutions, or points in the search space. To each individual solution a so-called fitness function is applied that determines the fitness. Based on this fitness, the individual is more or less likely to survive to a next round, where it is recombined with others, slightly mutated and again subjected to the fitness function. In this setup, there is an explicit fitness function, e.g. when designing a bridge in such a way, the criterion may be that the more weight it can hold the better. A fitness function can determine fitness as an absolute value or as relative to the fitness of other solutions.

In real evolution there is no explicit fitness function. Instead, the fitness is implicitly determined as «that which survives». Since the environment constantly changes, the fitness function is not only implicit, it is also constantly changing with the environment. What may be useful and lead to survival at some point in time, may lead to extinction at a different moment. This process has been simulated by evolutionary programming and artificial life. In economics, the market process can be said to perform the same function. There is no explicit fitness function to determine what product serves people's wishes best. What is seen as useful now, may be obsolete tomorrow. The interplay and competition of goods with each other determines what thrives and what will disappear.

3. Discovery and Creation

For a given problem, all its possible solutions are defined by the search space, and so are the fitnesses corresponding to it. This means that creation of information in the sense of a new solution to an existing problem is not possible. However, that information

may be implicitly contained in the search space, but because of the highly complex nature of the search space and its fitness function, it is not known by those who try to solve the problem. A process of discovery must be undertaken to reveal this information. This discovery process must be flexible enough to search the whole search space. If not, then it would miss parts of the search space and with it possible useful solutions. One could say that this process creates information, since it is now explicitly part of what is being considered a possible successful approach to a problem. In *Socialism, Economic Calculation, and Entrepreneurship* (2010b) Prof Huerta de Soto proposes a similar idea, namely that from an economic point of view, discovery and creation are one and the same thing. How this process of discovery and selection can be successful in a dynamic environment will be the subject of the next paragraph.

VI
DYNAMIC EFFICIENCY

1. Dynamic Efficiency

In a dynamic environment, the search space is too complex to be dealt with in a traditional static manner. Furthermore, when there are constant changes, the process must be highly adaptive. The search space must be explored, and the information gained by this process must be selected and filtered according to its usefulness. I will discuss two systems that can handle such a dynamic environment, and will state some general principles of dynamic efficiency.

a) Neural Networks

The brain and its abstraction, the artificial neural network, works by sometimes creating new connections, and in any case by constantly updating the strength of connections between the individual neural. This is a continuous process; each time there

is new information, a flow of pulses goes through the network. Not only does this flow quickly lead to a response by the system, but it also changes the relative strength of the connections. Since this is a parallel process, it doesn't take much time to be executed. Since the connections can change, a changing environment can be adapted to; the system changes with it. However, connections do not change radically, otherwise patterns would not be learnt, and every unexpected bit of data would be seen as the new norm.

b) Evolution

Biological evolution and its counterparts in artificial intelligence, i.e. genetic algorithms and evolutionary programming, are all well suited to a dynamic environment. In fact, the whole evolutionary process can be seen as a continuous search in a constantly changing world for a form that leads to more reproduction. In this process the steps of discovery and selection are more clearly distinguished. First there is mutation, which explores the search space. In biological evolution this includes both simple point mutation and cross-over. In artificial evolution, these same steps are usually involved, but can be more elaborate. Secondly, there is selection; in biological evolution this is natural selection. This process filters information and builds up structures consisting of more and more useful information. Especially when the discovery process involves crossover, information from different parts of the search space can be efficiently combined and spread through the system. That this process is capable of highly adaptive behavior is clear from the history of the world. Our planet has undergone some drastic changes in which many life forms have become extinct. Life itself, the giant search process for reproduction, has always continued.

c) Discovery vs Selection or Destruction vs Continuity

For the selection process to work, information has to be stable at least during that process; otherwise it cannot be built up and

spread through the system. On the other hand, if the system has a fixed size, or if the information is «embodied» in agents, as with e.g. the evolutionary process, then new discoveries can only be made by destroying (or at least changing) old structures.[5]

Too much emphasis on selection and continuity leads to a rigid system that cannot handle a dynamic environment. A fully static system is the extreme case of this. A system completely focused on discovery will likewise not lead to anything. Numerous great discoveries would be made, but the system would be far too random. The great discoveries would all be drowned by the noise of constantly created and destroyed information. In biological evolution, the genotype does not change during the selection process, i.e. during life. In the discovery stage, i.e. when a new form is created, there is some mutation, but not drastic. Most of the old structure is maintained in the next generation. In the case of a life form with no mutation at all, a change in living conditions, e.g. climate, will make this creature extinct, since it is not able to adapt. On the other hand, a creature with an extremely high mutation rate doesn't survive either, since all the adaptations it might discover will be destroyed in the next generation by that same process of mutation.

This means that a balance has to be found between discovery/destruction on the one hand and selection/continuity of information on the other hand. In the next section I will apply this analysis to economics.

2. Dynamic Efficiency in Economics

In paragraph IV.4 «Economic Calculation» it was shown that, for economies that are more than a handful of people, economic calculation in a top-down, manner, i.e. via central planning, is not feasible. However, advanced economies do exist, so it is apparently possible that resources are allocated efficiently in complex societies. Austrians usually explain this by way of the free market.

---

[5] In economics, this is similar to Joseph Alois Schumpeter's notion of «creative destruction», although not necessarily leading to economic cycles.

Another explanation uses the the concept of a search space and the general ideas of dynamic efficiency as outlined above, i.e. the idea of a balance between discovery/creation and selection/continuity.

a) Entrepreneurial Discovery

A first condition for finding good solutions is to make sure the whole search space is available for discovery. As such, this sounds rather trivial. However, in economics this is not widely recognized, or at least not the consequences that follow from it. Applied to economics, the search space corresponds to the whole of the economy, and the discovery process is driven by what Austrians call the «entrepreneurial function». Leaving the search space available for exploration, means not having any obstacles in the form of regulations or other government intervention that prevent the entrepreneur from developing economic activities.

Related to this, once goods are created, the discovery process works best when it is possible to change them. If not, the information embodied in them is fixed, and discovery is hindered. So, from an efficiency point of view, people should be free to change their goods as they wish. However, as discussed in section VI.2.b, a good should not be open to change by just anybody. It should only be the owner of a good that can change it.

Furthermore, it is obvious that a greater part of the search space can be explored when there are more agents. So not only is it more efficient when there are no restrictions on the search space, but more discoveries will also be made when there are no restrictions as to who can be an agent. All people should be completely free to use their entrepreneurial skills. The more people, the more and better information will be found and the better resources will be allocated.

All of the above supports the Austrian economists' view that a centrally planned economy is impossible. Since central planning blocks the entrepreneurial function, the relevant information cannot be discovered. This prevents agents from exploring the search space, either by prohibiting or interfering with markets

and goods, or by keeping people out of the discovery process altogether.

b) Market Selection

In biological evolution, information is embodied in strings of DNA that change by themselves without conscious interference. In contrast, in economics the selection process (i.e. the market) works on the combination of goods (or services) and agents that deliberately create these products. For the spreading of information during the selection process it is crucial that this combination stays intact. Goods should not suddenly be taken from their creators or changed by anyone else but their creators. If so, the information that a certain solution is useful (i.e. that a good serves people's wishes) will be disconnected from the agent creating the good, and will not influence him. Information about success or failure will in great part be lost and therefore not spread through the system. The feedback between selection and discovery will be broken. In economic terms, this means that people should have property rights over their goods, so that they know they are theirs to use, taking into account all the information the market provides them with.

The determination of fitness is fundamental to the selection process. In economic terms, the fitness of a good is not the price of the good, but rather the price compared to the costs of the good; i.e. the profit to be made with a good. This fitness arises from the interplay of preferences for that specific good, relative to preferences for other goods. (Actually, the fitness is determined not for a good as such, but rather the marginal unit of the good.) Since preferences are what determine fitness, it is crucial to the selection process that these preferences can be expressed as accurately as possible. Preferences are expressed through the exchange of goods and services on the market, so this means people should not only have full property rights to what is theirs, but also be free to exchange it as they see fit.

VII
CONCLUSION

In summary, the lessons that can be learnt from a study of dynamic systems with respect to economics are the following:

1. Access to the whole search space: no regulations that hinder the entrepreneurial function.
2. On the one hand destruction and creation of information: freedom for entrepreneurs to adjust their property how they want.
3. On the other hand selection and continuity of information: property rights ensuring the connection between creator and good, so that successful goods can spread through the economy.
4. Determination of fitness: freedom for people to exchange goods as they see fit.
5. More agents, better solutions: the more people that are actively involved in the economy, the better.

Since the economy is not a static system, advanced societies cannot be organized by central planning. Planned economies typically don't show growth, but rather decline. On the other hand, free market economies tend to grow and prosper. The five points outlined above show why: free market economies are based on what is efficient in a dynamic environment.

This analysis confirms the Austrian arguments regarding the impossibility of economic calculation. The Austrian approach and specifically the concept of «Dynamic Efficiency» as developed by Prof. Huerta de Soto in *The Theory of Dynamic Efficiency* (2010a), fits in a broader paradigm for dynamic systems that is applied to A.I., biology, computational science, complex systems, etc. and can be applied to economics as well.

BIBLIOGRAPHICAL REFERENCES

HUERTA DE SOTO, J. (2010a): *The Theory of Dynamic Efficiency*, London and New York: Routledge.

— (2010b): *Socialism, Economic Calculation and Entrepreneurship*, Cheltenham, England: Edward Elgar.