EVIDENCE FROM SURVEYS OF PRICE-SETTING MANAGERS:
POLICY LESSONS AND DIRECTIONS FOR ONGOING RESEARCH

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Abstract

Understanding the determinants of individual price setting behaviour is crucial for the formulation of monetary policy, especially in an economy experiencing ongoing structural change. These behavioural mechanisms play a fundamental role in influencing the characteristics of aggregate inflation and in determining how monetary policy affects inflation and real economic activity. Thus, this line of research can strengthen the conceptual foundations of general equilibrium models with sticky prices, enabling these models to provide monetary policymakers with an increasingly useful framework for interpreting and forecasting the evolution of the macroeconomy.

In this paper, we introduce the Walrasian model as a benchmark for comparison, and we discuss the extent to which recent micro evidence on firms’ price setting behavior provides significant support for some basic elements of the New Keynesian perspective. We then proceed to analyze the implications of the micro evidence in distinguishing between competing theories of price stickiness. Finally, the paper concludes with some brief reflections about the lessons for monetary policy.

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Evidence from surveys of price-setting managers: Policy lessons and directions for ongoing research

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Understanding the determinants of individual price setting behavior is crucial for the formulation of monetary policy, especially in an economy experiencing ongoing structural change. These behavioral mechanisms play a fundamental role in influencing the characteristics of aggregate inflation and in determining how monetary policy affects inflation and real economic activity. Thus, this line of research can strengthen the conceptual foundations of general equilibrium models with sticky prices, enabling these models to provide monetary policymakers with an increasingly useful framework for interpreting and forecasting the evolution of the macroeconomy.

These considerations provided a strong impetus for the Inflation Persistence Network (IPN), a collaborative research effort of the national central banks of the Eurosystem together with the European Central Bank (ECB). Fabiani, Loupias, Martins and Sabbatini (2007) provides a comprehensive report on the surveys of price setting managers that were conducted in nine euro area countries, covering a total of roughly 11,000 firms. In addition, as described in chapter 14 of Fabiani et al. (2007), the IPN analyzed a number of huge panel datasets of individual price records used in constructing producer as well as consumer price indices. Clearly, these two sources provide complementary types of information: the micro price data provides a means of quantifying individual price setting behavior, and the survey data facilitates the development of

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coherent explanations for those findings. Taken together, these two data sources represent a unique opportunity to document and interpret the characteristics of individual price setting behavior in the euro area. Furthermore, the breadth and scope of this evidence is unprecedented by international standards, with coverage that goes well beyond the data available for the United States or any other industrial economy. The main results on price setting coming from the analysis of these data sources are summarized in the introduction of Fabiani et al. (2007).

In this paper, we introduce the Walrasian model as a benchmark for comparison, and we discuss the extent to which recent micro evidence provides significant support for some basic elements of the New Keynesian perspective. We then proceed to analyze the implications of the micro evidence in distinguishing between competing theories of price stickiness. Finally, we conclude with some brief reflections about the lessons for monetary policy and potentially fruitful directions for further research.

1. The Walrasian Benchmark

The Walrasian model provides an invaluable benchmark for understanding resource allocation and price determination in general equilibrium. This model provides us with a precisely formulated set of conditions under which the equilibrium allocation of goods and services emerges as the outcome of a decentralized price mechanism—the “invisible hand” of Adam Smith. For example, the Walrasian model assumes that all markets are perfectly competitive and that every agent has the same information about the economy; furthermore, all prices adjust freely and continuously without any cost to ensure the equilibration of supply and demand of every product at every moment in time.

In general terms, the Walrasian model demonstrates that the price mechanism is capable, at least in principle, of yielding a resource allocation that satisfies some basic normative criteria. In particular, the first fundamental theorem of welfare economics indicates that every competitive

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5 For example, Blinder et al. (1998) only obtained responses from about 200 United States firms.
equilibrium is Pareto-optimal; that is, no individual’s welfare can be strictly improved without a decline in someone else’s welfare. Indeed, with some additional regularity conditions, it can also be shown that all Pareto-optimal resource allocations can be decentralized as competitive equilibria.

Of course, the assumptions underlying the Walrasian model are highly stylized and hence open to debate. For example, Fisher (1972) emphasized that the Walrasian framework “describes nobody’s actual behavior in most markets.” Okun (1981) argued that “models that focus on price-takers and auctioneers and that assume continuous clearing of the market generate inaccurate microeconomics as well as misleading macroeconomics.” and Kreps (1990) stressed that the Walrasian model provides no description of “who sets prices, or what gets exchanged for what, when and where.”

Thus, it is essential to determine the extent to which the Walrasian framework provides a useful description of the actual economy. Perhaps it is not surprising that some specific assumptions can be relaxed without causing the resource allocation to deviate substantially from the benchmark of Pareto optimality7.

2. Support for the “New Neoclassical Synthesis” and “New Keynesian” Perspectives

Stimulated by Lucas’ (1976) critique of the existing crop of structural macroeconomic models, the subsequent research agenda of “New Neoclassical Synthesis” or “New Keynesian” economics have sought to provide more rigorous microeconomic foundations for the existence of nominal rigidities. These foundations explicitly consider the decision-making problems of firms and consumers in the context of specific departures from the Walrasian benchmark. The recent micro evidence provides significant support for two fundamental elements of such an approach, namely, the infrequent adjustment of prices and the role of imperfectly competitive markets.

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7 See Foley (1994).
2.1 The Prices of Many Goods and Services Are Adjusted Relatively Infrequently

The micro evidence for the euro area indicates that retail and producer prices are only adjusted about twice a year on average. Of course, the prices of some items—such as automobile fuel, fresh fruits, and unprocessed meat—do change on a daily or weekly basis. In contrast, the prices of all other retail goods (excluding food and energy) have an average duration of about ten months, and the prices of consumer services typically remain unchanged for a year or longer. Indeed, as described in Fabiani et al. (2007), surveys of price setting behavior (in the euro area as well as other industrial economies) have consistently found that a majority of firms tend to adjust the price of their main product no more than once a year.

The relatively infrequent adjustment of retail and producer prices is particularly striking in contrast to the evolution of the macroeconomy, which exhibits continually changing levels of aggregate spending, employment, raw materials prices, asset prices, and so forth. Thus, in contrast to the Walrasian framework, it would seem evident that the adjustment of individual prices must be hindered by some sort of costs or constraints; otherwise, even the slightest change in an individual firm’s environment would cause a corresponding change in the prices of its products. Furthermore, the fact that price changes tend to be quite large—with a median adjustment exceeding 10% for many categories of the consumer price index—suggests that a firm’s decision to change its price is typically driven by sectoral or firm-specific considerations rather than the state of the macroeconomy.

2.2 Monopolistic Competition Is a Characteristic of Most Product Markets

Imperfect competition plays a crucial role in providing a rationale for sticky prices. Under perfect competition, each good is produced by many identical firms, all of which must charge exactly the same price (determined by the marginal cost of production) at every moment in time; any firm charging a lower price would operate at a loss, and any firm charging a higher price would have no sales at all. In such a market, all firms earn zero profits in equilibrium, and the price of the item adjusts continuously in response to even the slightest change in its marginal cost,
whether due to a fluctuation in the cost of raw materials, the price of electricity, wages, interest rates, or other cause. In contrast, in an environment of monopolistic competition, each individual firm’s products are distinct from those of its competitors. In this case, the firm can earn positive profits by charging a price for each item that incorporates a positive markup; that is, the price of the item exceeds its marginal cost of production. The widespread incidence of markup pricing was originally highlighted by the survey of Hall and Hitch (1939), who found that “an overwhelming majority of the entrepreneurs thought that a price based on full average cost (including a conventional allowance for profit) was the ‘right’ price, the one which ‘ought’ to be charged.” Along similar lines, Okun (1981) indicated that “the setting of prices by marking up costs is a good first approximation to actually observed behavior in most areas of industry, trade, and transportation.”

Of course, because the profit maximizing level of the markup depends on the elasticity of demand and on the relative prices of its competitors, the firm’s optimal price will vary over time in response to these factors, as well as in response to movements in marginal cost. However, a crucial insight of the New Keynesian approach is that a monopolistic competition framework combined with unsynchronized price setting implies that the firm does not have to adjust its price instantaneously in response to changes in marginal cost or the prices of its competitors: the firm still has substantial sales even if its price is a bit too high, and still earns positive profits even if its price is a bit too low.

The survey evidence provides strong support for the view that imperfect competition characterizes most product markets in the euro area. First, only about one-fourth of the firms report that their prices are primarily set to match the prices of their competitors—as one might expect in the case of a perfectly competitive market—and roughly the same proportion of firms indicate that a price reduction by at least one competitor would be considered “highly important” in determining whether the firm should cut its own price. In contrast, roughly half of the firms describe their prices as being determined by a markup over unit variable cost—consistent with the
stylized assumption of a monopolistically competitive market with a constant elasticity of demand—whereas the remainder indicate that their prices are determined by a different approach that is still suggestive of imperfect competition, perhaps with a more complex elasticity of demand.

Second, roughly two-thirds of the firms in these surveys indicated that long-term customers accounted for the bulk of their sales. The predominance of long-term relationships is entirely consistent with product differentiation and specialization, but would be virtually inconceivable in a perfectly competitive market (such as that observed for commodities such as gold) where the match between an individual buyer and an individual seller is random and transitory.

Third, it should be noted that only about 20% of the firms in these surveys report that the price of their main product is the same for all customers, as one would expect in a perfectly competitive market. The remaining 80% indicate that the actual price of their main product varies across customers, either on a case-by-case basis or as a function of the quantity sold. It should be noted that this pattern of price discrimination does not fit neatly into the stylized framework of monopolistic competition, which implies that all customers pay the same price for a given item at a given point in time (just as in the case of perfect competition). Nevertheless, this survey evidence is certainly consistent with the notion that most product markets comprise highly differentiated goods and services and hence exhibit relatively complex forms of imperfect competition.

Finally, as reported in Fabiani et al. (2007), the perceived degree of market competition is statistically significant in explaining cross-sectional variations in the use of markup pricing strategies and in the frequency of price reviews and changes; this evidence highlights the thorough implications of interactions between imperfect competition and nominal price rigidity (for instance, due to the existence of implicit and explicit contracts, menu costs, informational problems, unsynchronized price setting, or interaction between price and wage setting).
3. Evidence on Competing Theories of Price Setting Behavior

The recent micro evidence is also invaluable for performing an empirical assessment of various theories of price setting behavior, especially because many of these theories are difficult to distinguish based on macroeconomic data alone.

3.1 Downward Nominal Price Rigidity

This theory reflects the notion that firms may be reluctant to reduce the nominal prices of their products, perhaps because a cut in the nominal price would send an adverse signal to customers regarding a decline in the quality of the product. This form of nominal inertia might be inconsequential in an economy with high aggregate inflation, because a firm seeking to reduce its relative price could do so without actually cutting its nominal price. In contrast, in an economy with low aggregate inflation, one might observe an asymmetric pattern of price increases for those firms seeking to raise their relative price, and unchanged prices for the remaining firms that are constrained by the downward nominal rigidity. Nevertheless, this mechanism is generally inconsistent with the micro evidence. In the euro area, price reductions comprise roughly 40% of all changes in consumer prices and roughly 45% of all changes in producer prices, and the average magnitude of price cuts is nearly identical to the magnitude of price hikes; similar patterns are also evident in retail price data for the United States. And even these modest asymmetries may simply reflect the influence of a non-zero aggregate inflation rate. Furthermore, surveys in the euro area obtained little support for the notion that firms are reluctant to cut their prices due to fears that customers will make judgments about product quality based on price; indeed, this hypothesis was dismissed out of hand by the respondents in the survey conducted for the United States.

Finally, it should be noted that asymmetry in price setting is somewhat more evident in the service sector, where price decreases only account for about 20% of all price changes. This outcome might simply reflect upward trends in the price of services relative to consumer goods. 

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(corresponding to underlying sectoral differences in productivity growth), as well as lower volatility of shocks to the service sector. Alternatively, because labor costs constitute a high share of total cost in many service industries, the apparent asymmetry in the adjustment of service prices might result from downward nominal wage rigidity; thus, further research is evidently needed to investigate these hypotheses.

### 3.2 Smoothing Models of Price Adjustment

Suppose that the typical firm incurs convex adjustment costs whenever it changes the nominal price of its product; that is, these adjustment costs rise at an increasing rate as a function of the absolute magnitude of the price change. Given these adjustment costs, the firm’s optimal price setting behavior involves smooth and gradual adjustments, implying a persistent series of small consecutive adjustments rather than sudden large movements in either direction. As shown by Rotemberg (1982), convex adjustment costs provide elegant microeconomic foundations for the New Keynesian Phillips Curve; thus, this approach has subsequently been used in numerous analytical and empirical studies. Despite its elegance and tractability, its implications are clearly inconsistent with the micro evidence. First, as noted above, both retail and producer prices tend to be adjusted relatively infrequently (apart from the unprocessed food and energy sectors). Furthermore, as emphasized in Fabiani et al. (2007), the average magnitude of individual price adjustments is quite large: about 8% for consumer price increases, and roughly 10% for consumer price reductions.

### 3.3 Sticky Information

Mankiw and Reis (2002) have proposed an alternative framework in which information collection and processing is subjective to substantial fixed costs, whereas the actual adjustment of prices is completely costless. With sticky information and costless price adjustment, the firm’s optimal strategy—apart from certain extraordinary circumstances—is to perform a relatively

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9 Convex adjustment costs were first considered in the context of physical capital accumulation as a means of analyzing Tobin’s $q$ theory of investment.
infrequent updating of its information set and then reoptimize the intended trajectory for its nominal price. This optimal trajectory typically involves some price adjustment in every period, but the trajectory itself remains settled until the next time that the firm updates its information set. As shown by Mankiw and Reis (2002), sticky information yields implications for aggregate inflation dynamics that differ from those of the benchmark New Keynesian Phillips Curve in several important respects10.

However, micro evidence is generally inconsistent with this form of price adjustment. As previously noted, most retail and producer prices are adjusted relatively infrequently, rather than changing every period as in the sticky information model. Furthermore, firm-level surveys in the euro area and several other industrial economies have consistently found that the respondents do not perceive that costly information plays a significant role in their price setting decisions. Indeed, the euro area surveys indicate that the frequency of price review generally exceeds the frequency of price changes; that is, many price reviews do not result in a price change.

Of course, as with each of the other mechanisms considered here, the sticky information hypothesis almost certainly contains some important grains of truth that should be incorporated into a more nuanced price setting framework. For example, the euro area surveys find that forward-looking considerations play little or no role in the price reviews of a substantial proportion of respondents, perhaps due to difficulties in constructing or updating forecasts on a regular basis. In addition, it could well be the case that some of these price reviews are mainly oriented toward product-specific news and place insufficient emphasis on changes in the macroeconomic outlook. These issues deserve further investigation, perhaps even involving a new set of firm-level surveys.

10 Kiley (2006) compares the empirical implications of sticky prices versus sticky information by using United States macroeconomic data.
3.4 Staggered Nominal Contracts

Much of the New Keynesian literature has proceeded under the assumption that the price of each product is specified by an explicit or implicit multiperiod contract with the firm’s customers, who can purchase any desired quantity of the product at the specified price throughout the duration of the contract. Following the seminal work of Taylor (1999) and Calvo (1983), the timing of new contracts is assumed to be evenly staggered across firms and to be invariant to changes in the aggregate economy; thus, a constant fraction of all price contracts are reset at each point in time.\(^{11}\) Furthermore, the staggered contract structure implies that an aggregate demand shock (such as shift in the stance of monetary policy) will have effects on real economic activity that last longer than the duration of the typical contract.

The micro evidence is broadly consistent with some aspects of the staggered contracts framework. First, as we have already discussed, many retail and producer prices are adjusted only once or twice a year, and these adjustments tend to be staggered fairly evenly throughout the year (although some seasonality is observed in certain sectors). Second, most surveys of price setting managers indicate that nominal contracts play a key role in explaining why prices are not adjusted more frequently; indeed, implicit and explicit contracts were ranked as the two most important explanations by the respondents of the euro area surveys reported in this book. Finally, the evidence from disaggregated price records suggests that the overall frequency of price adjustment is reasonably stable, at least in environments of low and stable aggregate inflation.\(^{12}\) Nevertheless, the micro evidence directly contradicts the notion that price setting behavior can be generally characterized by staggered contracts with a fixed duration, as in the analysis of Taylor (1999).\(^{13}\)

The basic problem here is not the observed degree of sectoral heterogeneity in the frequency of price adjustment: although Taylor’s original formulation assumed an identical

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\(^{11}\) See Ball and Romer (1989) for analysis of staggering versus synchronization of price setting behavior.

\(^{12}\) See Klenow and Kryvostov (2006).

\(^{13}\) See King and Wolman (2004) and the analysis and references in Woodford (2003).
duration for all contracts, that formulation has subsequently been generalized to allow the contract duration to vary across different groups of firms.\textsuperscript{14} Rather, the fixed duration approach is clearly inconsistent with the findings of Aucremanne and Dhyne (2005), namely, relatively large variation in the duration of price spells for individual items in almost every product category in the consumer price index; that is, the interval between price changes tends to vary quite widely over time, even for a single item sold by an individual firm. Of course, it should be emphasized that fixed duration contracts may still provide a useful framework for modeling the determination of wages, especially in economies where labor unions represent a large fraction of the labor force. The micro evidence appears somewhat more consistent with the assumption that price contracts have a random duration that is invariant to the state of the aggregate economy, as in Calvo (1983) and numerous subsequent studies. In the special case where every firm faces the same probability in every period of being able to reset its price contract (regardless of how long its current contract has already lasted), this approach provides elegant and tractable foundations for the New Keynesian Phillips Curve.\textsuperscript{15}

To capture the sectoral heterogeneity noted above, the random duration contracting framework can be readily extended to permit the adjustment probability to vary across broad groups of firms.\textsuperscript{16} Furthermore, in contrast to the counterfactual predictions of the fixed duration framework, Aucremanne and Dhyne (2005) have found that Calvo style contracts yield roughly accurate predictions regarding the relationship between the mean duration and the coefficient of variation of individual price spells for most of the narrow categories of items in the consumer price index (apart from food and energy).

However, the recent evidence also highlights the extent to which the random duration contracting framework does not provide sufficiently deep microeconomic foundations for the

\textsuperscript{14} See Taylor (1993), Guerrieri (2002), and Coenen and Levin (2004).
\textsuperscript{15} See Yun (1996), Rotemberg and Woodford (1997), and Clarida et al. (1999), as well as the extensive bibliography of Woodford (2003).
\textsuperscript{16} See Álvarez et al. (2005).
analysis of price setting behavior. First, this framework starts from the premise that the contract adjustment probability is a fixed parameter, without providing any interpretation for the extent to which the average duration of price spells varies markedly across different sectors of the economy and even across narrow product categories within each sector. Nor does this framework provide any means of understanding the apparent differences in the frequency of price adjustment across major industrial economies, e.g. the euro area compared with the United States. Furthermore, surveys indicate that the timing of price adjustments typically reflects the incidence of substantial changes in production costs or the level of demand. Finally, the rapid response of prices to specific macroeconomic events (such as indirect tax increases or the euro cash changeover) or shifts in monetary policy regime (such as a decline in aggregate inflation) demonstrates that the frequency of price adjustment is not invariant to the state of the aggregate economy. Clearly, accounting for this evidence requires a framework with elements of state-dependent pricing and some combination of idiosyncratic and aggregate shocks.

3.5 Menu Costs and State-Dependent Pricing

Now suppose that the typical firm incurs a fixed cost (menu cost) whenever it changes the nominal price of its product; that is, the adjustment cost is invariant to the absolute magnitude of the price change, as well as to its sign (positive or negative). Given this fixed cost of adjustment, the firm will generally choose to leave its price unchanged until a single large firm-specific or sector-specific shock (or perhaps a sequence of smaller shocks) causes its optimal price to deviate sufficiently far from its actual price, at which point the firm resets its actual price to match the optimal one.

17 For example, Fabiani et al. (2007) shows that price flexibility is positively associated with the cost share of raw materials and negatively associated with the cost share of wages.
18 One revealing example is given by Stahl (2005), who finds that the incidence of price increases by German industrial firms exhibits significant peaks that coincide with hikes in negotiated wage rates.
19 Theoretical analysis of menu costs and price setting behavior includes Barro (1972), Sheshinski and Weiss (1977), Dixit (1991), and Hansen (1999). An important finding is that even “small” menu costs may give rise to considerable nominal stickiness at the macro level; see, for example, Akerlof and Yellen (1985), Mankiw (1985), and Blanchard and Kyotaki (1987).
The micro evidence is broadly consistent with several key predictions of the menu cost framework: most prices tend to remain constant for an extended period and then change by a relatively large magnitude, and these characteristics are essentially symmetric for both positive and negative price adjustments. Indeed, Danziger (1999) and Golosov and Lucas (2003) have shown that the underlying parameters of the model can be calibrated to yield empirically reasonable values for the frequency and magnitude of price adjustments; Gertler and Leahy (2005) modify some of the auxiliary assumptions and then proceed to demonstrate that this framework can provide a satisfactory accounting for aggregate inflation dynamics and the persistent real effects of monetary disturbances.

It should be noted, however, that the micro evidence also highlights several dimensions for refinement and further development of the menu cost framework. First, although the average magnitude of price changes is quite large, it is nonetheless apparent that small price adjustments are also very common; this characteristic was initially noted by Carlton (1986) and Kashyap (1995) for specific retail items, but the recent micro evidence reveals the same pattern for virtually every item in the consumer price index. Specific assumptions about the idiosyncratic shock process might account for these small price adjustments, but it also seems plausible that the menu cost itself may exhibit cross sectional variation—related to firms’ size and other characteristics—and perhaps also seasonal or business cycle variations.

Furthermore, the notion of literal “menu costs” is clearly inconsistent with the micro evidence. For example, Kashyap (1995) documented that the prices of many individual items remain unchanged across multiple editions of a retailer’s catalog—an outcome that is evidently unrelated to typesetting or printing costs—and many barbershops and other small retailers have no printed pricelist at all. Furthermore, the incidence of temporary sales and promotions (after which the price returns to its previous level) cannot be easily explained in terms of a fixed cost of posting new prices. Finally, firm-level surveys in the euro area and other industrial economies have consistently found that “physical costs of adjustment” do not play a significant role in price-
setting decisions. Thus, further research is needed to identify other sources of friction with implications broadly similar to those of fixed menu costs.

4. Implications for Monetary Policy

When considering the policy implications of analytical or empirical research, it is advisable to draw lessons that are robust to a variety of modeling approaches and econometric methods, rather than relying on any particular formalization of the economy\textsuperscript{20}. Thus, rather than trying to formulate any precise guidance for policymakers, we now focus on several broad lessons that can be inferred from the micro evidence.

4.1 The Monetary Transmission Mechanism

In the idealized Walrasian framework with competitive markets and flexible prices, the central bank may define the unit of account but its actions have no substantive effect on real economic activity; that is, monetary policy is completely “neutral” in such an environment. In contrast, as discussed above, the recent micro evidence makes it plausible to argue in favor of the New Keynesian view that monetary policy exhibits short-run non-neutrality due to the influence of imperfect competition and sticky prices, and hence that the conduct of monetary policy can have significant consequences for the evolution of the real economy. The intuition for this implication is quite straightforward: when prices are sticky, the central bank can implement a change in the policy rate and thereby affect real interest rates and hence the level of real aggregate expenditures\textsuperscript{21}.

In addition, recent analysis has highlighted the extent to which the frequency of price adjustment can play a key role in determining the short-run response of inflation to a shift in real

\textsuperscript{20} See Issing et al. (2005).

\textsuperscript{21} See Bernanke and Blinder (1988) and Kashyap and Stein (1994). Christiano and Gust (1999) have formulated an alternative framework in which the non-neutrality of money arises from financial market imperfections rather than sticky prices; however, the subsequent analysis of Christiano et al. (2005) found that nominal rigidities play a crucial role in explaining the real effects of money in a dynamic general equilibrium model. Finally, it should be noted that some models of price stickiness lead to results very close to monetary neutrality. For example, expanding on the earlier work of Caplin and Spulber (1987), the analysis of Golosov and Lucas (2003) demonstrates that monetary policy may have very small real effects in an economy with menu costs and idiosyncratic shocks, because a change in the money stock simply shifts the distribution of firms that choose to adjust their prices in a given period. As shown by Gertler and Leahy (2005), the introduction of real rigidities is crucial for explaining the real effects of monetary policy for an empirically reasonable degree of nominal rigidity.
economic activity. Indeed, in a comparison of the macroeconomic dynamics of the euro area vis-
à-vis the United States, Altissimo et al. (2006) have found that the persistence of the inflation
response to a cost push shock is quite similar for both economies, and the higher persistence of
the euro area output gap response can be largely explained by the lower frequency of adjustment
of prices in the euro area22.

4.2 The Case for Price Stability

The recent evidence also highlights the benefits of maintaining price stability over the
medium run—an aspect of the New Keynesian approach that was largely missing from the “old
Keynesian” analysis that reached a heyday in the 1950s and 1960s. In particular, the earlier
analysis placed relatively little emphasis on the social costs of inflation (especially compared with
the social costs of unemployment) and typically assumed a long-run downward sloping Phillips
Curve, implying that the optimal monetary policy might involve a higher average level of
inflation in exchange for a permanent reduction in the unemployment rate.

In contrast, the New Keynesian framework not only incorporates the long-run neutrality of
money—whereby a permanent rise in the stock of money eventually generates a corresponding
rise in the price level, and hence has no long-run real effects—but also emphasizes the degree to
which price stickiness reflects underlying costs, thus implying that a permanent rise in the growth
rate of money has adverse long-run effects on the real economy by distorting relative prices and
wasting resources through excessively frequent price adjustments23.

4.3 The Role of Expectations

Finally, the micro evidence provides substantial support for the view that establishing
credible policies and managing private sector expectations are crucial aspects of modern central

22 These results are obtained under the assumption that monetary policy responds optimally to the cost push shock; that
is, the central bank minimizes a standard objective function that reflects the goals of inflation stabilization and output
gap stabilization, as well as a smooth path for the short-term nominal interest rate.
23 See, for example, Goodfriend and King (1997, 2001), Clarida et al. (1999) and Woodford (2003) for analysis in the
case of sticky prices, and Ball et al. (2003) for corresponding analysis in the case of sticky information.
banking. In particular, in an environment with infrequent price changes, each firm has a strong incentive to assess not only current factors but also the future outlook whenever it resets its price. 

Euro area surveys largely reinforce this view: about half of the firms report that forward-looking considerations play an important role in their price setting behavior, whereas about one-third of them indicate that their assessments are mainly backward looking.

Along these lines, it should be emphasized that the credibility of a monetary policy regime oriented toward price stability is also helpful for stabilizing the economy in response to economic disturbances and hence improves the tradeoff between the variability of inflation and the volatility of other important macroeconomic variables such as output and employment. However, imperfect credibility may be associated with shocks to inflation—caused by “inflation scares” or revised beliefs about the central bank’s inflation objective—that may be quite costly to reverse in terms of foregone real economic activity. Moreover, the higher the degree of nominal rigidity, the higher this sacrifice ratio.

5. Directions for Further Research

Recent research reveals a negative relation between the frequency of price changes and the importance of wages as a fraction of costs. In particular, the IPN found that those sectors with a higher labor share, such as services, are typically characterized by a lower frequency of price changes. This suggests that it is essential to look at wage setting in order to understand price dynamics. Given the crucial importance that labor market behavior assumes in explaining business cycle dynamics and the pervasiveness of elements of structural rigidity in labor markets in the euro area, further research is warranted. Empirical research is needed to establish the relevant facts about wage setting. Theoretical research is necessary to incorporate a structural representation of labor markets into stochastic general equilibrium models of growth and business cycles. A new Eurosystem research network on wage dynamics has recently been initiated to shed further light on these issues.

24 See Goodfriend and King (1997, 2001), Clarida et al. (1999), and Woodford (2003).
In more general terms, the findings from the surveys constitute a challenge to researchers. The availability of high-quality micro datasets holds the promise of stimulating researchers to further develop theories able to account for both micro and macro facts in a general equilibrium framework.
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9/01 USING THE FIRST PRINCIPAL COMPONENT AS A CORE INFLATION INDICATOR
   — José Ferreira Machado, Carlos Robalo Marques, Pedro Duarte Neves, Afonso Gonçalves da Silva

10/01 IDENTIFICATION WITH AVERAGED DATA AND IMPLICATIONS FOR HEDONIC REGRESSION STUDIES
    — José A.F. Machado, João M.C. Santos Silva
2002

1/02 QUANTILE REGRESSION ANALYSIS OF TRANSITION DATA
— José A.F. Machado, Pedro Portugal

2/02 SHOULD WE DISTINGUISH BETWEEN STATIC AND DYNAMIC LONG RUN EQUILIBRIUM IN ERROR CORRECTION MODELS?
— Susana Botas, Carlos Robalo Marques

3/02 MODELLING TAYLOR RULE UNCERTAINTY
— Fernando Martins, José A. F. Machado, Paulo Soares Esteves

4/02 PATTERNS OF ENTRY, POST-ENTRY GROWTH AND SURVIVAL: A COMPARISON BETWEEN DOMESTIC AND FOREIGN OWNED FIRMS
— José Mata, Pedro Portugal

— João Valle e Azevedo

6/02 AN “ART”, NOT A “SCIENCE”? CENTRAL BANK MANAGEMENT IN PORTUGAL UNDER THE GOLD STANDARD, 1854 -1891
— Jaime Reis

7/02 MERGE OR CONCENTRATE? SOME INSIGHTS FOR ANTITRUST POLICY
— Margarida Catalão-Lopes

8/02 DISENTANGLING THE MINIMUM WAGE PUZZLE: ANALYSIS OF WORKER ACCESSIONS AND SEPARATIONS FROM A LONGITUDINAL MATCHED EMPLOYER-EMPLOYEE DATA SET
— Pedro Portugal, Ana Rute Cardoso

9/02 THE MATCH QUALITY GAINS FROM UNEMPLOYMENT INSURANCE
— Mário Centeno

10/02 HEDONIC PRICES INDEXES FOR NEW PASSENGER CARS IN PORTUGAL (1997-2001)
— Hugo J. Reis, J.M.C. Santos Silva

11/02 THE ANALYSIS OF SEASONAL RETURN ANOMALIES IN THE PORTUGUESE STOCK MARKET
— Miguel Balbina, Nuno C. Martins

12/02 DOES MONEY GRANGER CAUSE INFLATION IN THE EURO AREA?
— Carlos Robalo Marques, Joaquim Pina

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— Tiago V.de V. Cavalcanti, Álvaro A. Novo

2003

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— P.A. Geroski, José Mata, Pedro Portugal

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— José Brandão de Brito, Felipa de Mello Sampayo

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— Isabel Correia, Juan Pablo Nicolini, Pedro Teles
FORECASTING EURO AREA AGGREGATES WITH BAYESIAN VAR AND VECM MODELS
— Ricardo Mourinho Félix, Luís C. Nunes

CONTAGIOUS CURRENCY CRISSES: A SPATIAL PROBIT APPROACH
— Álvaro Novo

THE DISTRIBUTION OF LIQUIDITY IN A MONETARY UNION WITH DIFFERENT PORTFOLIO RIGIDITIES
— Nuno Alves

COINCIDENT AND LEADING INDICATORS FOR THE EURO AREA: A FREQUENCY BAND APPROACH
— António Rua, Luís C. Nunes

WHY DO FIRMS USE FIXED-TERM CONTRACTS?
— José Varejão, Pedro Portugal

NONLINEARITIES OVER THE BUSINESS CYCLE: AN APPLICATION OF THE SMOOTH TRANSITION AUTOREGRESSIVE MODEL TO CHARACTERIZE GDP DYNAMICS FOR THE EURO-AREA AND PORTUGAL
— Francisco Craveiro Dias

WAGES AND THE RISK OF DISPLACEMENT
— Anabela Carneiro, Pedro Portugal

SIX WAYS TO LEAVE UNEMPLOYMENT
— Pedro Portugal, John T. Addison

EMPLOYMENT DYNAMICS AND THE STRUCTURE OF LABOR ADJUSTMENT COSTS
— José Varejão, Pedro Portugal

THE MONETARY TRANSMISSION MECHANISM: IS IT RELEVANT FOR POLICY?
— Bernardino Adão, Isabel Correia, Pedro Teles

THE IMPACT OF INTEREST-RATE SUBSIDIES ON LONG-TERM HOUSEHOLD DEBT: EVIDENCE FROM A LARGE PROGRAM
— Nuno C. Martins, Ernesto Villanueva

THE CAREERS OF TOP MANAGERS AND FIRM OPENNESS: INTERNAL VERSUS EXTERNAL LABOUR MARKETS
— Francisco Lima, Mário Centeno

TRACKING GROWTH AND THE BUSINESS CYCLE: A STOCHASTIC COMMON CYCLE MODEL FOR THE EURO AREA
— João Valle e Azevedo, Siem Jan Koopman, António Rua

CORRUPTION, CREDIT MARKET IMPERFECTIONS, AND ECONOMIC DEVELOPMENT
— António R. Antunes, Tiago V. Cavalcanti

BARGAINED WAGES, WAGE DRIFT AND THE DESIGN OF THE WAGE SETTING SYSTEM
— Ana Rute Cardoso, Pedro Portugal

UNCERTAINTY AND RISK ANALYSIS OF MACROECONOMIC FORECASTS: FAN CHARTS REVISITED
— Álvaro Novo, Maximiano Pinheiro
HOW DOES THE UNEMPLOYMENT INSURANCE SYSTEM SHAPE THE TIME PROFILE OF JOBLESS DURATION?
— John T. Addison, Pedro Portugal

REAL EXCHANGE RATE AND HUMAN CAPITAL IN THE EMPIRICS OF ECONOMIC GROWTH
— Delfim Gomes Neto

ON THE USE OF THE FIRST PRINCIPAL COMPONENT AS A CORE INFLATION INDICATOR
— José Ramos Maria

OIL PRICES ASSUMPTIONS IN MACROECONOMIC FORECASTS: SHOULD WE FOLLOW FUTURES MARKET EXPECTATIONS?
— Carlos Coimbra, Paulo Soares Esteves

STYLIZED FEATURES OF PRICE SETTING BEHAVIOUR IN PORTUGAL: 1992-2001
— Mónica Dias, Daniel Dias, Pedro D. Neves

A FLEXIBLE VIEW ON PRICES
— Nuno Alves

ON THE FISHER-KONIECZNY INDEX OF PRICE CHANGES SYNCHRONIZATION
— D.A. Dias, C. Robalo Marques, P.D. Neves, J.M.C. Santos Silva

INFLATION PERSISTENCE: FACTS OR ARTEFACTS?
— Carlos Robalo Marques

WORKERS’ FLOWS AND REAL WAGE CYCLICALITY
— Anabela Carneiro, Pedro Portugal

MATCHING WORKERS TO JOBS IN THE FAST LANE: THE OPERATION OF FIXED-TERM CONTRACTS
— José Varejão, Pedro Portugal

THE LOCATIONAL DETERMINANTS OF THE U.S. MULTINATIONALS ACTIVITIES
— José Brandão de Brito, Felipa Mello Sampayo

KEY ELASTICITIES IN JOB SEARCH THEORY: INTERNATIONAL EVIDENCE
— John T. Addison, Mário Centeno, Pedro Portugal

RESERVATION WAGES, SEARCH DURATION AND ACCEPTED WAGES IN EUROPE
— John T. Addison, Mário Centeno, Pedro Portugal

— Nuno Alves

NOMINAL WAGE INERTIA IN GENERAL EQUILIBRIUM MODELS
— Nuno Alves

MONETARY POLICY IN A CURRENCY UNION WITH NATIONAL PRICE ASYMMETRIES
— Sandra Gomes

NEOCLASSICAL INVESTMENT WITH MORAL HAZARD
— João Ejarque

MONETARY POLICY WITH STATE CONTINGENT INTEREST RATES
— Bernardino Adão, Isabel Correia, Pedro Teles
| 19/04 | MONETARY POLICY WITH SINGLE INSTRUMENT FEEDBACK RULES  
|       | — Bernardino Adão, Isabel Correia, Pedro Teles |
| 20/04 | ACCOUNTING FOR THE HIDDEN ECONOMY: BARRIERS TO LAGALITY AND LEGAL FAILURES  
|       | — António R. Antunes, Tiago V. Cavalcanti |

**2005**

| 1/05  | SEAM: A SMALL-SCALE EURO AREA MODEL WITH FORWARD-LOOKING ELEMENTS  
|       | — José Brandão de Brito, Rita Duarte |
| 2/05  | FORECASTING INFLATION THROUGH A BOTTOM-UP APPROACH: THE PORTUGUESE CASE  
|       | — Cláudia Duarte, António Rua |
| 3/05  | USING MEAN REVERSION AS A MEASURE OF PERSISTENCE  
|       | — Daniel Dias, Carlos Robalo Marques |
| 4/05  | HOUSEHOLD WEALTH IN PORTUGAL: 1980-2004  
|       | — Fátima Cardoso, Vanda Geraldes da Cunha |
| 5/05  | ANALYSIS OF DELINQUENT FIRMS USING MULTI-STATE TRANSITIONS  
|       | — António Antunes |
| 6/05  | PRICE SETTING IN THE AREA: SOME STYLIZED FACTS FROM INDIVIDUAL CONSUMER PRICE DATA  
|       | — Emmanuel Dhyme, Luis J. Álvarez, Hervé Le Bihan, Giovanni Veronese, Daniel Dias, Johannes Hoffmann, Nicole Jonker, Patrick Lünnemann, Fabio Rumler, Jouko Vilmunen |
| 7/05  | INTERMEDIATION COSTS, INVESTOR PROTECTION AND ECONOMIC DEVELOPMENT  
|       | — António Antunes, Tiago Cavalcanti, Anne Villamil |
| 8/05  | TIME OR STATE DEPENDENT PRICE SETTING RULES? EVIDENCE FROM PORTUGUESE MICRO DATA  
|       | — Daniel Dias, Carlos Robalo Marques, João Santos Silva |
| 9/05  | BUSINESS CYCLE AT A SECTORAL LEVEL: THE PORTUGUESE CASE  
|       | — Hugo Reis |
| 10/05 | THE PRICING BEHAVIOUR OF FIRMS IN THE EURO AREA: NEW SURVEY EVIDENCE  
| 11/05 | CONSUMPTION TAXES AND REDISTRIBUTION  
|       | — Isabel Correia |
| 12/05 | UNIQUE EQUILIBRIUM WITH SINGLE MONETARY INSTRUMENT RULES  
|       | — Bernardino Adão, Isabel Correia, Pedro Teles |
| 13/05 | A MACROECONOMIC STRUCTURAL MODEL FOR THE PORTUGUESE ECONOMY  
|       | — Ricardo Mourinho Félix |
| 14/05 | THE EFFECTS OF A GOVERNMENT EXPENDITURES SHOCK  
|       | — Bernardino Adão, José Brandão de Brito |
| 15/05 | MARKET INTEGRATION IN THE GOLDEN PERIPHERY – THE LISBON/LONDON EXCHANGE, 1854-1891  
|       | — Rui Pedro Esteves, Jaime Reis, Fabiano Ferramosca |

**2006**

| 1/06  | THE EFFECTS OF A TECHNOLOGY SHOCK IN THE EURO AREA  
<p>|       | — Nuno Alves, José Brandão de Brito, Sandra Gomes, João Sousa |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/02</td>
<td>THE TRANSMISSION OF MONETARY AND TECHNOLOGY SHOCKS IN THE EURO AREA</td>
<td>Nuno Alves, José Brandão de Brito, Sandra Gomes, João Sousa</td>
</tr>
<tr>
<td>3/06</td>
<td>MEASURING THE IMPORTANCE OF THE UNIFORM NONSYNCHRONIZATION HYPOTHESIS</td>
<td>Daniel Dias, Carlos Robalo Marques, João Santos Silva</td>
</tr>
<tr>
<td>4/06</td>
<td>THE PRICE SETTING BEHAVIOUR OF PORTUGUESE FIRMS EVIDENCE FROM SURVEY DATA</td>
<td>Fernando Martins</td>
</tr>
<tr>
<td>6/06</td>
<td>NOMINAL DEBT AS A BURDEN ON MONETARY POLICY</td>
<td>Javier Díaz-Giménez, Giorgia Giovannetti, Ramon Marimon, Pedro Teles</td>
</tr>
<tr>
<td>7/06</td>
<td>A DISAGGREGATED FRAMEWORK FOR THE ANALYSIS OF STRUCTURAL DEVELOPMENTS IN PUBLIC FINANCES</td>
<td>Jana Kremer, Cláudia Rodrigues Braz, Teunis Brosens, Geert Langenus, Sandro Momigliano, Mikko Spolander</td>
</tr>
<tr>
<td>8/06</td>
<td>IDENTIFYING ASSET PRICE BOOMS AND BUSTS WITH QUANTILE REGRESSIONS</td>
<td>José A. F. Machado, João Sousa</td>
</tr>
<tr>
<td>9/06</td>
<td>EXCESS BURDEN AND THE COST OF INEFFICIENCY IN PUBLIC SERVICES PROVISION</td>
<td>António Afonso, Vítor Gaspar</td>
</tr>
<tr>
<td>10/06</td>
<td>MARKET POWER, DISMISSAL THREAT AND RENT SHARING: THE ROLE OF INSIDER AND OUTSIDER FORCES IN WAGE BARGAINING</td>
<td>Anabela Carneiro, Pedro Portugal</td>
</tr>
<tr>
<td>11/06</td>
<td>MEASURING EXPORT COMPETITIVENESS: REVISITING THE EFFECTIVE EXCHANGE RATE WEIGHTS FOR THE EURO AREA COUNTRIES</td>
<td>Paulo Soares Esteves, Carolina Reis</td>
</tr>
<tr>
<td>12/06</td>
<td>THE IMPACT OF UNEMPLOYMENT INSURANCE GENEROSITY ON MATCH QUALITY DISTRIBUTION</td>
<td>Mário Centeno, Alvaro A. Novo</td>
</tr>
<tr>
<td>13/06</td>
<td>U.S. UNEMPLOYMENT DURATION: HAS LONG BECOME LONGER OR SHORT BECOME SHORTER?</td>
<td>José A.F. Machado, Pedro Portugal e Juliana Guimarães</td>
</tr>
<tr>
<td>14/06</td>
<td>EARNINGS LOSSES OF DISPLACED WORKERS: EVIDENCE FROM A MATCHED EMPLOYER-EMPLOYEE DATA SET</td>
<td>Anabela Carneiro, Pedro Portugal</td>
</tr>
<tr>
<td>15/06</td>
<td>COMPUTING GENERAL EQUILIBRIUM MODELS WITH OCCUPATIONAL CHOICE AND FINANCIAL FRICTIONS</td>
<td>António Antunes, Tiago Cavalcanti, Anne Villamil</td>
</tr>
<tr>
<td>16/06</td>
<td>ON THE RELEVANCE OF EXCHANGE RATE REGIMES FOR STABILIZATION POLICY</td>
<td>Bernardino Adao, Isabel Correia, Pedro Teles</td>
</tr>
<tr>
<td>17/06</td>
<td>AN INPUT-OUTPUT ANALYSIS: LINKAGES VS LEAKAGES</td>
<td>Hugo Reis, António Rua</td>
</tr>
</tbody>
</table>

**2007**

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/07</td>
<td>RELATIVE EXPORT STRUCTURES AND VERTICAL SPECIALIZATION: A SIMPLE CROSS-COUNTRY INDEX</td>
<td>João Amador, Sónia Cabral, José Ramos Maria</td>
</tr>
</tbody>
</table>
2/07 THE FORWARD PREMIUM OF EURO INTEREST RATES
— Sônia Costa, Ana Beatriz Galvão

3/07 ADJUSTING TO THE EURO
— Gabriel Fagan, Vítor Gaspar

4/07 SPATIAL AND TEMPORAL AGGREGATION IN THE ESTIMATION OF LABOR DEMAND FUNCTIONS
— José Varejão, Pedro Portugal

5/07 PRICE SETTING IN THE EURO AREA: SOME STYLISED FACTS FROM INDIVIDUAL PRODUCER PRICE DATA
— Philip Vermeulen, Daniel Dias, Maarten Dossche, Erwan Gautier, Ignacio Hernando, Roberto Sabbatini, Harald Stahl

6/07 A STOCHASTIC FRONTIER ANALYSIS OF SECONDARY EDUCATION OUTPUT IN PORTUGAL
— Manuel Coutinho Pereira, Sara Moreira

7/07 CREDIT RISK DRIVERS: EVALUATING THE CONTRIBUTION OF FIRM LEVEL INFORMATION AND OF MACROECONOMIC DYNAMICS
— Diana Bonfim

8/07 CHARACTERISTICS OF THE PORTUGUESE ECONOMIC GROWTH: WHAT HAS BEEN MISSING?
— João Amador, Carlos Coimbra

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— João Amador, Carlos Coimbra

10/07 IDENTIFYING UNEMPLOYMENT INSURANCE INCOME EFFECTS WITH A QUASI-NATURAL EXPERIMENT
— Mário Centeno, Alvaro A. Novo

11/07 HOW DO DIFFERENT ENTITLEMENTS TO UNEMPLOYMENT BENEFITS AFFECT THE TRANSITIONS FROM UNEMPLOYMENT INTO EMPLOYMENT
— John T. Addison, Pedro Portugal

12/07 INTERPRETATION OF THE EFFECTS OF FILTERING INTEGRATED TIME SERIES
— João Valle e Azevedo

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— João Valle e Azevedo

14/07 INTERNATIONAL TRADE PATTERNS OVER THE LAST FOUR DECADES: HOW DOES PORTUGAL COMPARE WITH OTHER COHESION COUNTRIES?
— João Amador, Sónia Cabral, José Ramos Maria

15/07 INFLATION (MIS)PERCEPTIONS IN THE EURO AREA
— Francisco Dias, Cláudia Duarte, António Rua

16/07 LABOR ADJUSTMENT COSTS IN A PANEL OF ESTABLISHMENTS: A STRUCTURAL APPROACH
— João Miguel Ejarque, Pedro Portugal

17/07 A MULTIVARIATE BAND-PASS FILTER
— João Valle e Azevedo

18/07 AN OPEN ECONOMY MODEL OF THE EURO AREA AND THE US
— Nuno Alves, Sandra Gomes, João Sousa

19/07 IS TIME RIPE FOR PRICE LEVEL PATH STABILITY?
— Vítor Gaspar, Frank Smets, David Vestin
<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/07</td>
<td>IS THE EURO AREA M3 ABANDONING US?</td>
<td>Nuno Alves, Carlos Robalo Marques, João Sousa</td>
</tr>
<tr>
<td>21/07</td>
<td>DO LABOR MARKET POLICIES AFFECT EMPLOYMENT COMPOSITION? LESSONS FROM EUROPEAN COUNTRIES</td>
<td>António Antunes, Mário Centeno</td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/08</td>
<td>THE DETERMINANTS OF PORTUGUESE BANKS’ CAPITAL BUFFERS</td>
<td>Miguel Boucinha</td>
</tr>
<tr>
<td>2/08</td>
<td>DO RESERVATION WAGES REALLY DECLINE? SOME INTERNATIONAL EVIDENCE ON THE DETERMINANTS OF RESERVATION WAGES</td>
<td>John T. Addison, Mário Centeno, Pedro Portugal</td>
</tr>
<tr>
<td>3/08</td>
<td>UNEMPLOYMENT BENEFITS AND RESERVATION WAGES: KEY ELASTICITIES FROM A STRIPPED-DOWN JOB SEARCH APPROACH</td>
<td>John T. Addison, Mário Centeno, Pedro Portugal</td>
</tr>
<tr>
<td>4/08</td>
<td>THE EFFECTS OF LOW-COST COUNTRIES ON PORTUGUESE MANUFACTURING IMPORT PRICES</td>
<td>Fátima Cardoso, Paulo Soares Esteves</td>
</tr>
<tr>
<td>5/08</td>
<td>WHAT IS BEHIND THE RECENT EVOLUTION OF PORTUGUESE TERMS OF TRADE?</td>
<td>Fátima Cardoso, Paulo Soares Esteves</td>
</tr>
<tr>
<td>6/08</td>
<td>EVALUATING JOB SEARCH PROGRAMS FOR OLD AND YOUNG INDIVIDUALS: HETEROGENEOUS IMPACT ON UNEMPLOYMENT DURATION</td>
<td>Luis Centeno, Mário Centeno, Álvaro A. Novo</td>
</tr>
<tr>
<td>7/08</td>
<td>FORECASTING USING TARGETED DIFFUSION INDEXES</td>
<td>Francisco Dias, Maximiano Pinheiro, António Rua</td>
</tr>
<tr>
<td>8/08</td>
<td>STATISTICAL ARBITRAGE WITH DEFAULT AND COLLATERAL</td>
<td>José Fajardo, Ana Lacerda</td>
</tr>
<tr>
<td>9/08</td>
<td>DETERMINING THE NUMBER OF FACTORS IN APPROXIMATE FACTOR MODELS WITH GLOBAL AND GROUP-SPECIFIC FACTORS</td>
<td>Francisco Dias, Maximiano Pinheiro, António Rua</td>
</tr>
<tr>
<td>10/08</td>
<td>VERTICAL SPECIALIZATION ACROSS THE WORLD: A RELATIVE MEASURE</td>
<td>João Amador, Sónia Cabral</td>
</tr>
<tr>
<td>11/08</td>
<td>INTERNATIONAL FRAGMENTATION OF PRODUCTION IN THE PORTUGUESE ECONOMY: WHAT DO DIFFERENT MEASURES TELL US?</td>
<td>João Amador, Sónia Cabral</td>
</tr>
<tr>
<td>12/08</td>
<td>IMPACT OF THE RECENT REFORM OF THE PORTUGUESE PUBLIC EMPLOYEES’ PENSION SYSTEM</td>
<td>Maria Manuel Campos, Manuel Coutinho Pereira</td>
</tr>
<tr>
<td>13/08</td>
<td>EMPIRICAL EVIDENCE ON THE BEHAVIOR AND STABILIZING ROLE OF FISCAL AND MONETARY POLICIES IN THE US</td>
<td>Manuel Coutinho Pereira</td>
</tr>
<tr>
<td>14/08</td>
<td>IMPACT ON WELFARE OF COUNTRY HETEROGENEITY IN A CURRENCY UNION</td>
<td>Carla Soares</td>
</tr>
<tr>
<td>15/08</td>
<td>WAGE AND PRICE DYNAMICS IN PORTUGAL</td>
<td>Carlos Robalo Marques</td>
</tr>
</tbody>
</table>
16/08 IMPROVING COMPETITION IN THE NON-TRADABLE GOODS AND LABOUR MARKETS: THE PORTUGUESE CASE
    — Vanda Almeida, Gabriela Castro, Ricardo Mourinho Félix

17/08 PRODUCT AND DESTINATION MIX IN EXPORT MARKETS
    — João Amador, Luca David Opromolla

18/08 FORECASTING INVESTMENT: A FISHING CONTEST USING SURVEY DATA
    — José Ramos Maria, Sara Serra

19/08 APPROXIMATING AND FORECASTING MACROECONOMIC SIGNALS IN REAL-TIME
    — João Valle e Azevedo

20/08 A THEORY OF ENTRY AND EXIT INTO EXPORTS MARKETS
    — Alfonso A. Irarrazabal, Luca David Opromolla

21/08 ON THE UNCERTAINTY AND RISKS OF MACROECONOMIC FORECASTS: COMBINING JUDGEMENTS WITH SAMPLE AND MODEL INFORMATION
    — Maximiano Pinheiro, Paulo Soares Esteves

22/08 ANALYSIS OF THE PREDICTORS OF DEFAULT FOR PORTUGUESE FIRMS
    — Ana I. Lacerda, Russ A. Moro

23/08 INFLATION EXPECTATIONS IN THE EURO AREA: ARE CONSUMERS RATIONAL?
    — Francisco Dias, Cláudia Duarte, António Rua

2009

1/09 AN ASSESSMENT OF COMPETITION IN THE PORTUGUESE BANKING SYSTEM IN THE 1991-2004 PERIOD
    — Miguel Boucinha, Nuno Ribeiro

2/09 FINITE SAMPLE PERFORMANCE OF FREQUENCY AND TIME DOMAIN TESTS FOR SEASONAL FRACTIONAL INTEGRATION
    — Paulo M. M. Rodrigues, Antonio Rubia, João Valle e Azevedo

3/09 THE MONETARY TRANSMISSION MECHANISM FOR A SMALL OPEN ECONOMY IN A MONETARY UNION
    — Bernardino Adão

4/09 INTERNATIONAL COMOVEMENT OF STOCK MARKET RETURNS: A WAVELET ANALYSIS
    — António Rua, Luís C. Nunes

5/09 THE INTEREST RATE PASS-THROUGH OF THE PORTUGUESE BANKING SYSTEM: CHARACTERIZATION AND DETERMINANTS
    — Paula Antão

6/09 ELUSIVE COUNTER-CYCLICALITY AND DELIBERATE OPPORTUNISM? FISCAL POLICY FROM PLANS TO FINAL OUTCOMES
    — Álvaro M. Pina

7/09 LOCAL IDENTIFICATION IN DSGE MODELS
    — Nikolay Iskrev

8/09 CREDIT RISK AND CAPITAL REQUIREMENTS FOR THE PORTUGUESE BANKING SYSTEM
    — Paula Antão, Ana Lacerda

9/09 A SIMPLE FEASIBLE ALTERNATIVE PROCEDURE TO ESTIMATE MODELS WITH HIGH-DIMENSIONAL FIXED EFFECTS
    — Paulo Guimarães, Pedro Portugal
<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/09</td>
<td>REAL WAGES AND THE BUSINESS CYCLE: ACCOUNTING FOR WORKER AND FIRM HETEROGENEITY — Anabela Carneiro, Paulo Guimarães, Pedro Portugal</td>
</tr>
<tr>
<td>11/09</td>
<td>DOUBLE COVERAGE AND DEMAND FOR HEALTH CARE: EVIDENCE FROM QUANTILE REGRESSION — Sara Moreira, Pedro Pita Barros</td>
</tr>
<tr>
<td>12/09</td>
<td>THE NUMBER OF BANK RELATIONSHIPS, BORROWING COSTS AND BANK COMPETITION — Diana Bonfim, Qinglei Dai, Francesco Franco</td>
</tr>
<tr>
<td>13/09</td>
<td>DYNAMIC FACTOR MODELS WITH JAGGED EDGE PANEL DATA: TAKING ON BOARD THE DYNAMICS OF THE IDIOSYNCRATIC COMPONENTS — Maximiano Pinheiro, António Rua, Francisco Dias</td>
</tr>
<tr>
<td>14/09</td>
<td>BAYESIAN ESTIMATION OF A DSGE MODEL FOR THE PORTUGUESE ECONOMY — Vanda Almeida</td>
</tr>
<tr>
<td>15/09</td>
<td>THE DYNAMIC EFFECTS OF SHOCKS TO WAGES AND PRICES IN THE UNITED STATES AND THE EURO AREA — Rita Duarte, Carlos Robalo Marques</td>
</tr>
<tr>
<td>16/09</td>
<td>MONEY IS AN EXPERIENCE GOOD: COMPETITION AND TRUST IN THE PRIVATE PROVISION OF MONEY — Ramon Marimon, Juan Pablo Nicolini, Pedro Teles</td>
</tr>
<tr>
<td>17/09</td>
<td>MONETARY POLICY AND THE FINANCING OF FIRMS — Fiorella De Fiore, Pedro Teles, Oreste Tristani</td>
</tr>
<tr>
<td>18/09</td>
<td>HOW ARE FIRMS’ WAGES AND PRICES LINKED: SURVEY EVIDENCE IN EUROPE — Martine Druant, Silvia Fabiani, Gabor Kezdi, Ana Lamo, Fernando Martins, Roberto Sabbatini</td>
</tr>
<tr>
<td>20/09</td>
<td>ON LM-TYPE TESTS FOR SEASONAL UNIT ROOTS IN THE PRESENCE OF A BREAK IN TREND — Luis C. Nunes, Paulo M. M. Rodrigues</td>
</tr>
<tr>
<td>21/09</td>
<td>A NEW MEASURE OF FISCAL SHOCKS BASED ON BUDGET FORECASTS AND ITS IMPLICATIONS — Manuel Coutinho Pereira</td>
</tr>
<tr>
<td>22/09</td>
<td>AN ASSESSMENT OF PORTUGUESE BANKS’ COSTS AND EFFICIENCY — Miguel Boucinha, Nuno Ribeiro, Thomas Weyman-Jones</td>
</tr>
<tr>
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