

# Chapter 9

## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium

### 9.1 Introduction with Questions again and again

The author has had several serious questions. The author has been motivated by these questions. Why do the world economies repeat bubbles once or twice within one decade? What are true causes of budgetary deficit? The author protests superficial answers to these questions, saying ‘Oh no, your answers remain some parts of whole results or lead to short-sighted countermeasures.’ True causes may be clarified in such a way of ‘Scientific Revolutions,’ as advocated by Thomas S. Kuhn (1962, 1996). This Chapter compares the flexibility of the wage rate and the rate of return with marginal productivities of labor and capital and, emphasizes true results to correct varying answers. One aspect here is the characteristics of the wage rate and the rate of return measured at endogenous and actual data of the real assets in national accounts. This Chapter concisely presents examples of actual data vs. endogenous data for the above flexibility.

Backgrounds of various aspects spread over the following questions:

- Do you think that policies conquer bubbles?
- Do you think that policies conquer high inflation or continuous deflation (as in Japan)?
- Do you think that policies conquer unemployment?
- Do you think that policies conquer deflation?
  - Do you think that the causes of economic results have been clarified already?
    - Do you distinguish countermeasures with essential solutions?
    - Do you distinguish policies with strategies to support policies?
- Does ample money supply present a true clue to solve the above causes?
- Does one-sided tax reduction present a true clue to solve the above causes?
- Does huge deficit present a true clue to solve the above causes?
- Does huge tariffs and subsidies present a true clue to solve the above causes?
  - What is the cause of ‘one-sided tax reduction’?
- What is the cause of ‘huge deficit and cash flow out’?
  - What is the cause of ‘ample money supply’?
- What is the cause of ‘bubbles and high inflation’?
- What is the cause of ‘low growth and deflation’?

This chapter starts with a definition of the endogenous-equilibrium. The definition is essential to the understanding of the endogenous organic system of author’s. The endogenous-equilibrium is guaranteed by the marginal productivities of labor and capital,  $MPL = \partial Y / \partial L = w$  and  $MPK = \partial Y / \partial K = r^*$ . The two equality equations were

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proved by Robinson, J. (1934) by applying the Euler's Theorem to the linear homogeneous production function (under the constant returns to scale). Author's KEWT database by country and year in the endogenous-equilibrium measures  $MPL = w$  and  $MPK = r^*$ , deleting the assumptions set in the literature.

Simultaneous measurement of  $MPL = w$  and  $MPK = r^*$  makes it possible for researchers to test the characteristics of the wage rate  $w$  and the rate of return  $r^*$ ; flexible or inflexible by year in the endogenous organic system. If  $w$  and  $r^*$  are really flexible by year, the state realizes an endogenous equilibrium. What does this mean by? It means that economic policies are able to control an economy in the real assets and without interrupted by short-sighted funds in the markets. More fundamentally, it means that perfect competition exists in economies and extra returns are zero. Assumption of perfect competition is deleted if the flexibility of  $w$  and  $r^*$  prevails. Why does the assumption of perfect competition in the literature so important?<sup>1</sup> This is discussed in the methodology below.

Certainly, the price-equilibrium has been assumed for the last three Centuries by economists. The price-equilibrium holds actually and always in economies. The balance between macro demand and supply has been simultaneously recovered by the price-equilibrium. This is true. A problem is: this assumption hides true causes against results. For example, deficit immediately recovers the unbalance between macro demand and supply but, without specifying its causes and solving these causes. Someone, for example, claims that for recovering disequilibrium, tax and expenditure reduction with ample money supply have saved crises. But, these executions remain counterparts and aggravate the unbalance in the long run since true causes are not taken away.

Two problems exist even today: (1) The price-equilibrium does not clarify the process recovering from disequilibrium. (2) There exists Samuelson's (1998) dictum lying between the macro and micro levels, as discussed by Jung, J. and Shiller, R. J. (221-228, 2004) using the stock market. Someone says that the price-equilibrium is measured using computer science power. But, how does this measurement by country catch the changes in economic policies by country and by year in the dramatically changing global world?

Lucas's critique (1976), in fact, has not been solved in terms of causes and results in a strict sense, when actual statistics data are only used for econometrics. Moreover, there are various causes behind the price-equilibrium and, even a genius cannot clarify fundamental causes since the whole numerical system is alive like a human body and cannot be divided into separable factor parts. Causes ceaselessly change by year and over years.

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<sup>1</sup> Samuelson, P. A. (1957) showed a dissection of Marxian economic models, where a definite defect was traced back to imperfect competition. This is a reply to historical marginal productivity theory (endogenous MPT).

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### 9.2 Methodology with Some Aspects

For methodology, the endogenous-equilibrium is a surrogate for the price-equilibrium yet, clarifies fundamental causes by measuring the following seven endogenous parameters: (1) Four: The ratio of net investment to output,  $i = I/Y$ , the rate of change in population in equilibrium,  $n_E$ , and the relative share of capital,  $\alpha = \Pi/Y$ . These four ratios are each fixed at the KEWT database and its transitional path by year. Note that  $i_G = I_G/Y_G$  at the government sector is additionally required for the endogenous-equilibrium. (2) Three: The quantitative/qualitative net investment coefficient,  $\beta^*$  or  $1 - \beta^*$ , the capital-output ratio,  $\Omega = K/Y$ , and the diminishing returns to capital (DRC) coefficient,  $\delta_0 = 1 + LN(\Omega^*)/LN(B^*)$ . These three ratios each change at the KEWT database and its transitional path by year. As a result, the rate of return,  $r^* = \alpha/\Omega$ , is measured at once, where the growth rate of output,  $g_Y^*$ , is connected with the rate of return,  $r^* = (\alpha/i \cdot \beta^*)g_Y^*$ .

Returning back to  $MPL = w$  and  $MPK = r^*$ , the marginal rate of substitution (MRS) is defined as the rate of return to the wage rate ( $r/w$ ) in equilibrium, where just for abbreviation ( $r/w$ ) is used instead of ( $r^*/w$ ). The elasticity of substitution is

defined by  $\sigma = -\frac{\Delta k/k}{\Delta MRS/MRS} = -\frac{(\Delta K/L)/(K/L)}{\Delta(r/w)/(r/w)}$ . For the process to formulate these equations

and related researches, see earlier *PRSCE* 41 (Sep, 1): 277-350 and also *PRSCE* 50 (Feb, 2): 389-428. Note that these papers are not yet based on the endogenous system in the strictest sense today 2010.

When *sigma* as a result is flexible over years, it means that the economy is robust and the level of endogenous equilibrium is sustainable. If *sigma*, as a result, is inflexible over years, the economy is inflexible or loses sustainable robustness, falling into disequilibrium. How can the flexibility of  $w$  and  $r$  be recovered? Is it the answer to improve seven endogenous parameters? Then, how do seven endogenous parameters improve? These parameters are determined by the cause and effect relationships in the endogenous organic system. Note, however, that the recovery from inflexibility does not guarantee a robust sustainability of an economy. The flexibility remains one of sufficient conditions to support endogenous equilibrium.  $MPL = w$  and  $MPK = r^*$  is a necessary condition to support endogenous equilibrium as clarified by the definition of the endogenous-equilibrium. The endogenous organic system under perfect completion measures and proves that at an optimum point of equilibrium the ratio of net investment to output is minimized, by using endogenous speed years by country and by sector. This implies that the least net investment produces the maximum returns in the endogenous organic system. The endogenous system does not follow maximum principle as shown by using parabolic equations in the literature but minimum net investment and maximum returns are guaranteed by using hyperbolas.

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To author's understanding, the rate of technological progress never has been measured at 'purely endogenous' in the literature, regardless of the differences between neo-classical and Keynesian. The author here interprets a rigid neo-classical methodology by Meade, J. E. (1962). Robinson, J. (1961) calls his model 'equilibrium growth.' Meade (ibid; for notations, see p.184-85), formulates two sectors for capital and consumer goods, and uses each saved share of profits, wages, and rents to national income; the rate of profits and the rate of interest; the rate of technical progress; and other values and their respective growth rate. Meade (107, ibid.) shows a parabolic curve of the growth rate of output, whose horizontal axis is output=national income,  $Y$ . The cross point of  $Y$  and the curve is shown by the capital-output ratio  $K/Y \times$  the growth rate of  $MPK \div$  the elasticity of the rate of profit to capital. Meade distinguishes  $MPK$  with the rate of profit and,  $MPL$  with the wage rate, based on the real assets. If Meade could formulate his rate of technical progress endogenously, and if corresponding data were available at that time, Meade might be almost successful in integrating his whole model more endogenously. Meade, instead of using endogenous equations, assumed a number of elasticity values.

Author's endogenous system, on the other hand, always confirms  $MPK=r$  and  $MPL=w$ , as indicated above. Furthermore, the endogenous system measures the endogenous rate of inflation/deflation, with the endogenous rate of full-employment in equilibrium and, the endogenous rates of un-employment and over-employment in disequilibrium. Priority order of economic policies would be endogenous equilibrium, employment with low inflation,  $MPL=w$  and  $MPK=r$  and then, the flexibility of  $w$  and  $r$ . Mundell, R. A. (1961) published "A Theory of Optimum Currency Areas. From the aspect of the exchange rate, factor mobility within an area and outside of the area is most important; for example, within the EU and outside of the EU. The author is keen on the relationship between the flexibility of  $w$  and  $r$  and the mobility of factors,  $K$  and  $L$ . A complete mobility of factors shows a final stage of developed countries. Mobility cannot be far from the flexibility of  $w$  and  $r$ . Accordingly, the level of mobility is indirectly measured by the level of flexibility of  $w$  and  $r$ , as shown in this chapter. There has been no accurate measurement for the mobility by country hitherto.

Here first the author must express a viewpoint on Samuelson's (1970) constancy of the capital-output ratio at the KEWT database and its transitional path. The endogenous system maintains one presumption that the current/initial capital-output ratio is equal to the capital-output ratio at convergence in the transitional path;  $\Omega = \Omega^* = \Omega_0$ . This presumption produces another presumption of  $r = r^* = r_0$  under a fixed relative share of capital/returns.  $\Omega = \Omega^* = \Omega_0$  and  $r = r^* = r_0$  are necessitated to avoid tautology.

A question: Is the consistency common to recursive programming and the KEWT database? To answer this question, the author revisited the endogenous model starting with *JES* 7 (Feb, 1): 51-80, 2004. For the measurement of  $MPL=w$  and  $MPK=r$ , it is

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essential to simultaneously obtain the rate of return with capital stock by year, as pursued by Robinson, J. (1959): She argued that neither the rate of return under assumption of a given capital  $K$  nor capital  $K$  under assumption of a given rate of return  $r$  are justified. When  $r$  and  $K$  are simultaneously measured, endogenous equilibrium holds and its level is measured endogenously using the speed years,  $1/\lambda^*$ ,  $\lambda^* = (1 - \alpha)n + (1 - \delta_0)g_A^*$ .

Next, policy-makers need to compare endogenous data with actual and market data by year. Otherwise, useful and prompt policy-decisions cannot be executed. How can the market rate, for example, the ten year debt yield be compared with the current rate of return in equilibrium? Assume that the current rate of return equals the rate of return at convergence:  $r = r^* = r_0$ . Ten year debt yield,  $r_{M(DEBT)} = r_{M(10yrs)}$ , is then compatible with  $r = r^* = r_0$  in equilibrium. If the situation is under disequilibrium,  $r_{M(DEBT)} = r_{M10yrs}$  will rise up, but  $r=r^*=r_0$  falling into ‘out of measurement.’ This is because the rate of return is close to the vertical asymptote in the hyperbola. The KEWT database and its recursive programming by year is always consistent (see Chapter 16).

### 9.3 Preparatory Processes towards the Tests of Flexibility

This section first raises the items selected for the tests of the wage rate and the rate of return and second, adds interpretations to some of fundamental items, since some data are not well available at low developing countries despite of the efforts of IMF.

First, selected items are the following. These items basically show the true cause and effect relationship towards each country’s sustainable robustness in the endogenous-equilibrium.

1. Minimum items (I): i)  $bop = BOP/Y$  is the balance of payments divided by endogenous national income  $Y$ . ii)  $\Delta d = \Delta D/Y$  is budgetary deficit divided by  $Y$ . iii)  $tax = Y_G/Y = T_{AX}/Y$  determines the size of government using endogenous taxes measured in the endogenous system. iv)  $i_{FDI} = I_{FDI}/Y$  is the ratio of foreign direct investment to  $Y$  and shows private sector’s investment abroad. The original data ‘79abd’ at IFSY, IMF, is  $FDI$  as *stock* in International Investment Position (i.e., in the financial assets). The stock is converted to *flow* using  $FDI \times r_{PRI}^* \div Y$ , where the rate of return at the private sector  $r_{PRI}^* = \Pi_{PRI}/K_{PRI}$ . A robust developed country steadily increases  $i_{FDI} = I_{FDI}/Y$  over years. The author needs to comment on the relationship between the flexibility of  $w$  and  $r$  in equilibrium and the mobility of factors,  $K$  and  $L$ . The author here points out that actual capital stock  $K_{actual}$  is difficult to estimate by country, as proved by JES 12 (Feb, 2): 59-104, and that actual labor or population mobility needs specific statistics.
2. Minimum items (II): Endogenous net investment to  $Y$ ,  $i = I/Y$ , is an engine for

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technology and growth. The comparison of actual and endogenous net investment, v)  $i_{actu} = I_{actu}/Y_{actu}$  and vi)  $i_{endo} = I_{endo}/Y_{endo}$ , are most important and shows the level of sustainable robustness of an economy: vii)  $i_{actu-endo} = i_{actu} - i_{endo}$  and viii)  $i_{actu}/i_{endo}$ .

3. Preferable item:  $g_{w actu/endo} = g_{w actu}/g_{w endo}$  is the growth rate of the wage index, as shown by 65ey or 65eyc in *IFSY*, IMF. This item is more explained soon below.
4. Minimum items (III): ix) The actual ratio of  $r$  to  $w$ ,  $(r/w)_{actu}$ , x) the endogenous ratio of  $r$  to  $w$ ,  $(r/w)_{endo}$ , and xi)  $(r/w)_{actu/endo} = (r/w)_{actu}/(r/w)_{endo}$ . Author's  $(r/w)$  corresponds with the marginal rate of substitution (*MRS*) in the literature.

The total number of the above minimum items is eleven and the preferable item is one. Many developing countries will prepare for the wage index gradually in the future.

The above items basically imply that the more moderate the balance of payments and deficit the more robust the base of an economy in equilibrium is.  $bop = BOP/Y$  has a moderate plus and minus ranges for robustness but, the more close to  $\Delta d = 0$  of an economy the broader flexible policies the economy could select.

Second, there are three levels of data accuracy for the tests of the wage rate and the rate of return as follows:

1. No actual data of the wage index (65ey or 65eyc in *IFSY*, IMF), as seen at KEWT 5.11-4 for 19 countries (Western Hemisphere, Near East, and Africa).
2. Actual data of the wage index (65ey or 65eyc in *IFSY*, IMF) are available, as seen at KEWT 5.11-1, 2, and 3 for 46=14+15+17 countries (Pacific and Asia, the EU, and Europe).
3. Additional data of actual wages and returns, using the SNA data by country, as seen at KEWT 5.11-6 for the US and Japan, 1960-2009, where actual wages produce the actual wage rate and, actual returns produce the actual rate of return.

When actual wages and returns are available at *IFSY*, IMF, in the future, then, the tests become perfect. The author here confirms that even without the above actual data 3., the wage rate is roughly tested though it is not perfect. For this confirmation, the author first tested the relationship between the wage rate and the rate of change in wages by using the US and Japan. The rate of change in wages is obtained directly by using the wage index. In fact, the wage rate has been significantly stable at the US and Japan, and the rate of change in wages has been sharply fluctuated. However, the author finds, the fluctuation of the rate of change in wages almost evenly has spread above and below the wage rate. This implies that the wage index can be a surrogate for 'actual wages' unable to obtain at *IFSY*, IMF statistics.

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Likewise, when ‘actual returns’ are not available at IMF data, how can policy-makers find the actual rate of return? There is no way to find the actual rate of return. However, the author confirms that the trend of the actual rate of return has been close to that of the endogenous rate of return while the market rate for the short term has fluctuated sometimes sharply for the last two decades, as shown by the US and Japan. This implies that the endogenous rate of return exists as a base for the actual rate of return even if the actual rate of return is unknown.

For reinforcement, the author endogenously measures the elasticity of substitution, *sigma*, by using the ratio of the rate of return to the wage rate,  $(r/w)$ , in equilibrium:

$$\sigma = \frac{-\Delta k/k}{\Delta(r/w)/(r/w)}. \quad \Delta(r/w) = \Delta r/\Delta w$$
 is called the marginal rate of substitution (MRS) in the literature. The *sigma* is accurately and always shows 1.00 in the case of recursive programming when the denominator is calculated using the two period average:

$$\sigma = \frac{-\Delta k / \left( \frac{k_0 + k_1}{2} \right)}{\Delta(r/w) / \left( \frac{r_0 + r_1}{2} / \frac{w_0 + w_1}{2} \right)}.$$

The *sigma* at the KEWT database, however, has been vividly fluctuated for the last two decades, as shown by the US and Japan. And, any country has the *sigma* in equilibrium at the KEWT database. For tests, the *sigma* is able to be more than a surrogate for the wage index.

### 9.4 Concluding remarks: Test results and Implications of the Flexibility of $w$ & $r^*$

The author preserves seven sub-files in KEWT 5.11 for 65 countries, 1990-2009, in addition to KEWT 6.12, 1990-2010. The original data come from IMF actual statistics. **BOXEX 9-1** and **9-2** each show results overwhelmingly.

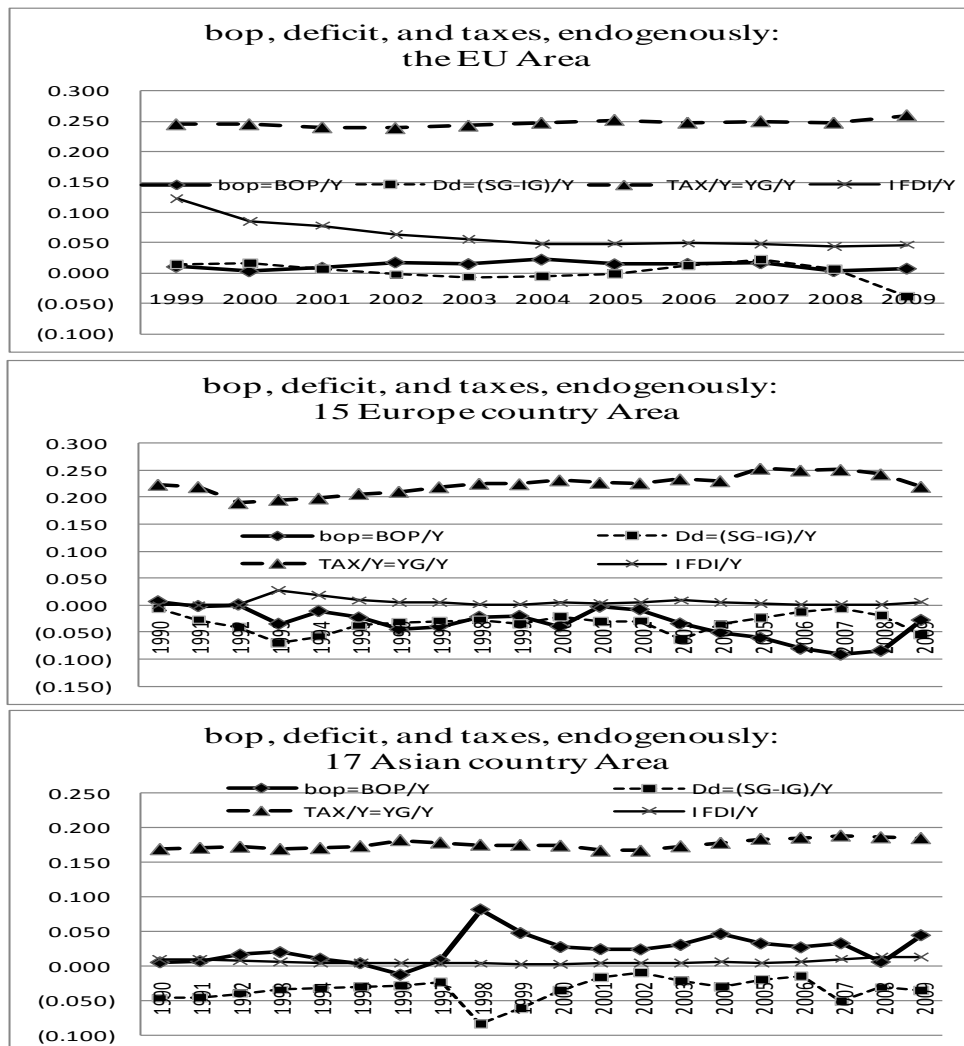
The author briefly explains endogenous results each by each with related figures, and conveys good and bad policy implications. Remind of a fact that results have causes based on the real assets under the neutrality of the financial/market assets. Geographic philosophy is moderation, as shown by a hyperbola. Moderation is tested not only by seven endogenous parameters but also by variables.

1. 65 countries have maintained moderate range of endogenous equilibrium, except for 2008 and 2009 suffering from bubbles and financial crisis. Recent deficits have been used for the recovery of financial institutions in many countries yet, some Asian countries are free from these urgent countermeasures. Surprisingly, each country has its own different economic policies and shows different results in the real assets. The

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real assets are more moderate than policy-makers have in mind today. Yet, some countries have been weak at maintaining endogenous equilibrium for the last two decades, showing inflexibility of the wage are and the rate of return several times under disequilibrium.

**BOX 9-1** Ratios of BOP to Y, deficit to Y, tax to Y, and FDI to Y for the EU Area, 15- country Europe Area and 17- country Asian Area

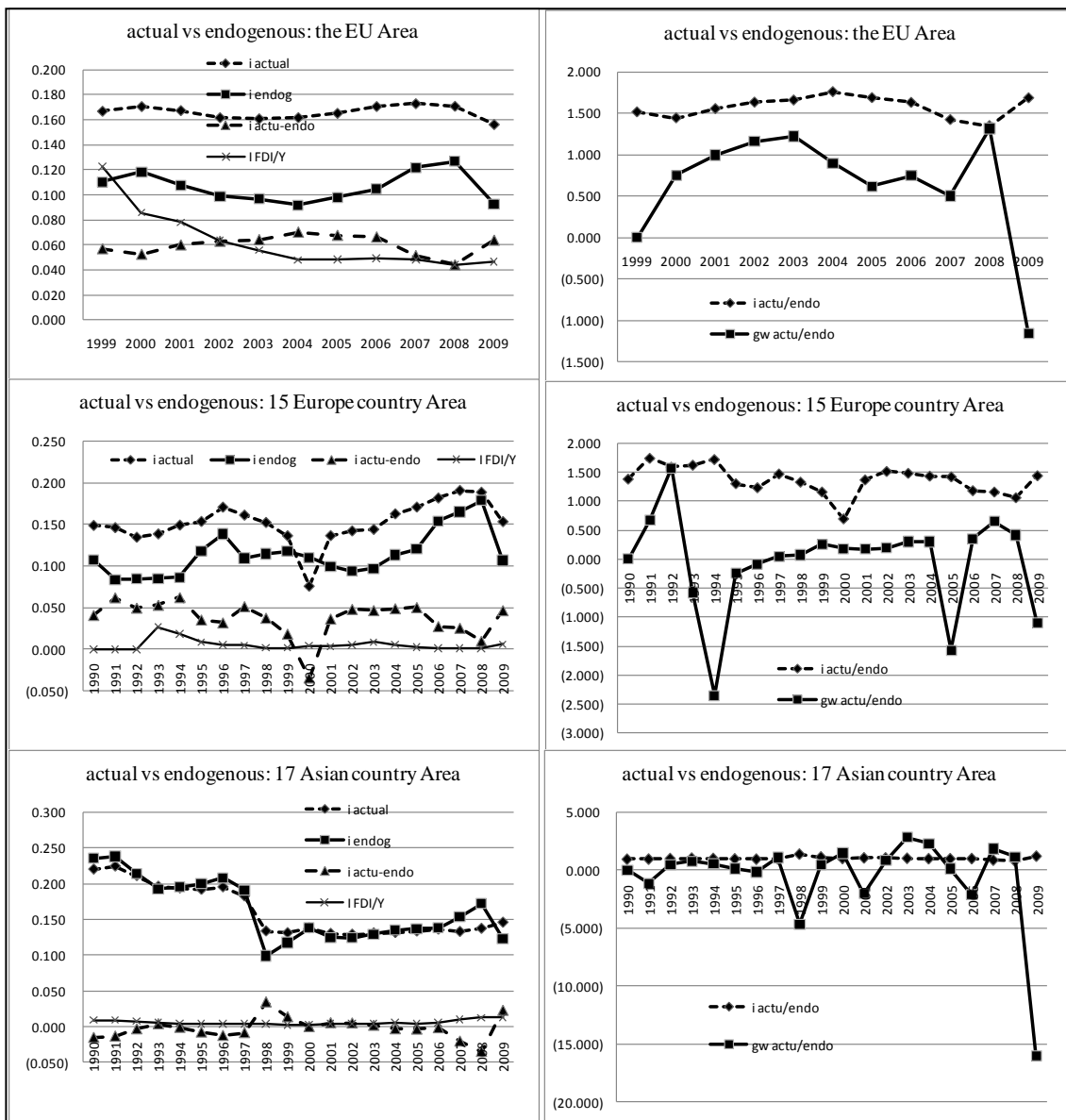


**Data source:** KEWT 5.11-1, -2, -3 by area and by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF



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**BOX 9-2** Actual versus endogenous for net investment and wage rate flexibility:  
by Area using weighted averages

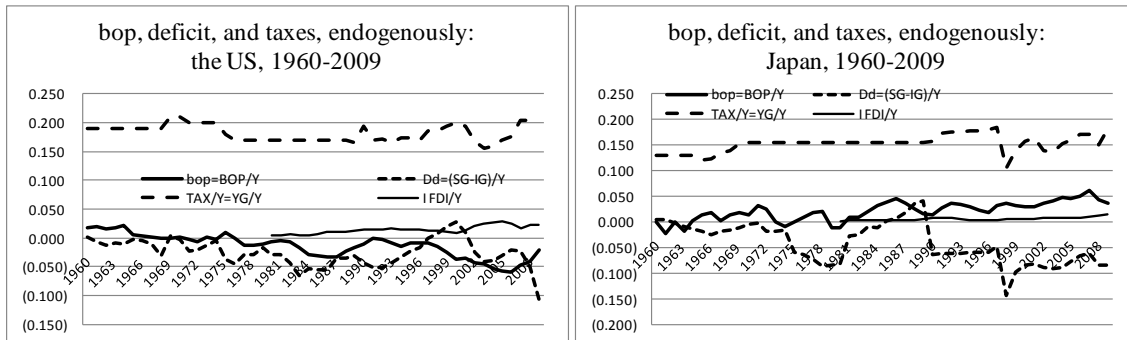


**Data source:** KEWT 5.11-1, -2, -3 by area and by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

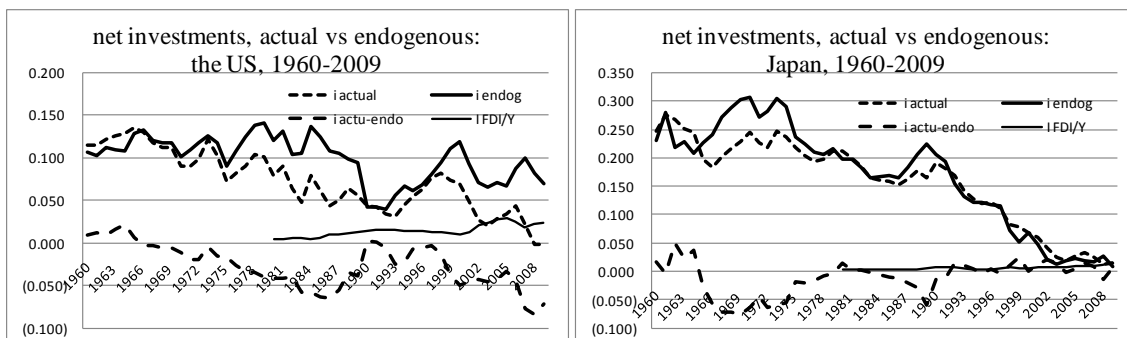
2. The balance of payments and deficit structure differ by country. Roughly, there are four patterns as shown by  $bop = \Delta d + (s_{PRI} - i_{PRI})$ : (1) +, +, + or -, -, -; (2) +, -, +; (3) -, -, +; and (4) +, -, + or +, -, -, where (1) is almost falling into disequilibrium and (4) is close to disequilibrium. Like an organic body, most countries stay at (2) or (3) in equilibrium. The PRI sector must be robust. Unfortunately, Japan is close to disequilibrium at (4), where  $i_{PRI} = I_{PRI}/Y_{PRI}$  is close to zero, compared with other

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countries due to abnormal deficits over years. Under any situation by country, the endogenous taxes to output, shown by  $Y_G/Y$ , determines a fundamental base for equilibrium as the size of government. This item spread over from 0.10 to 0.40 depending on each national culture and preferences with technology. When policy-makers violate this rule, the results are not preferable, unstable or fluctuating in endogenous equilibrium. This is related to speed years by country and by sector.



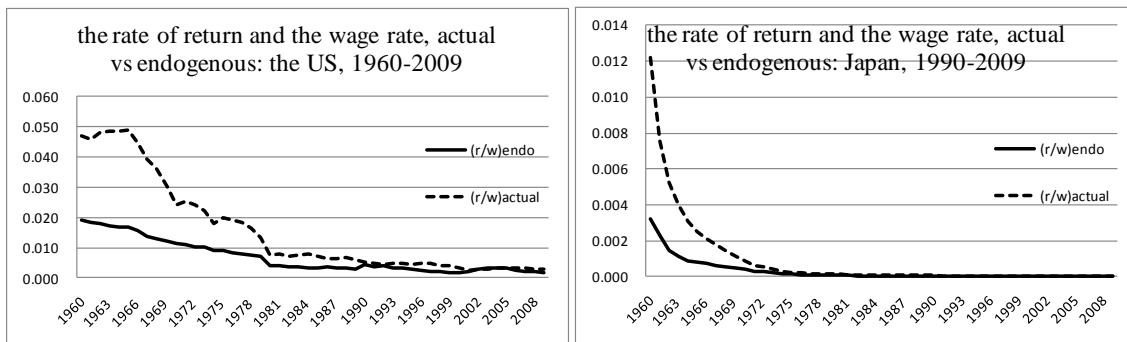
3. The good or bad symptom is most fluently shown by the trend of  $i = I/Y$ . A robust country has a high level of  $i_{actu} = I_{actu}/Y_{actu}$  and shows  $i_{actu} = I_{actu}/Y_{actu} > i_{endo} = I_{endo}/Y_{endo}$ . On the contrary, developed countries suffering huge deficits have a low level of  $i_{actu} = I_{actu}/Y_{actu}$  and shows  $i_{actu} = I_{actu}/Y_{actu} < i_{endo} = I_{endo}/Y_{endo}$ . When  $i_{endo} = I_{endo}/Y_{endo}$  is close to zero, as shown in Japan, growth power is almost absorbed by the government sector. No one can increase  $i = I/Y$  due to this fact. This is a coolheaded hypothesis proved in the endogenous system. Many developed countries know this fact intuitively and now try to reduce deficit or oppress deficit.



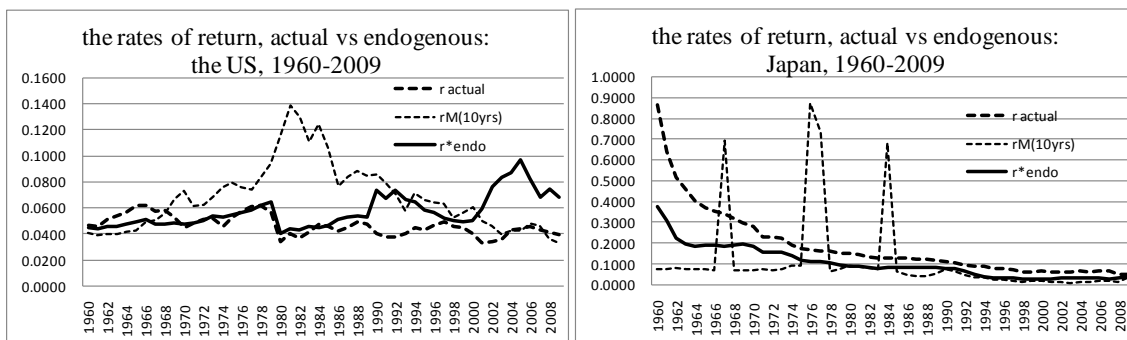
4. The good or bad symptom is accurately shown by the trend of  $(r/w)_{actu}$ ,  $(r/w)_{endo}$ , and  $(r/w)_{actu/endo}$ . Policy-makers must watch and accept this trend as an integrated signal. This signal accurately reflects the qualitative (think of next generations) level of democracy or physical-oriented philosophy of people by country. This is justified by the fact that poor/developing countries have much more obstacles than those of developed countries and yet endeavor to cope with numerical obstacles

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endowed with the qualitative net investment coefficient,  $\beta^*$ , the capital-output ratio,  $\Omega$ , and  $\delta_0$ , in equilibrium.<sup>2</sup>  $(r/w)_{actu}$ ,  $(r/w)_{endo}$ , and  $(r/w)_{actu/endo}$  are measured as one of minimum items at any country regardless of the statistics accuracy levels at poor/developing countries at *IFS*, IMF. To Author's understanding, some countries such as China, Singapore, and Malaysia have intuitively controlled  $(r/w)_{actu}$  and  $(r/w)_{endo}$ , by prompt decisive actions by year.



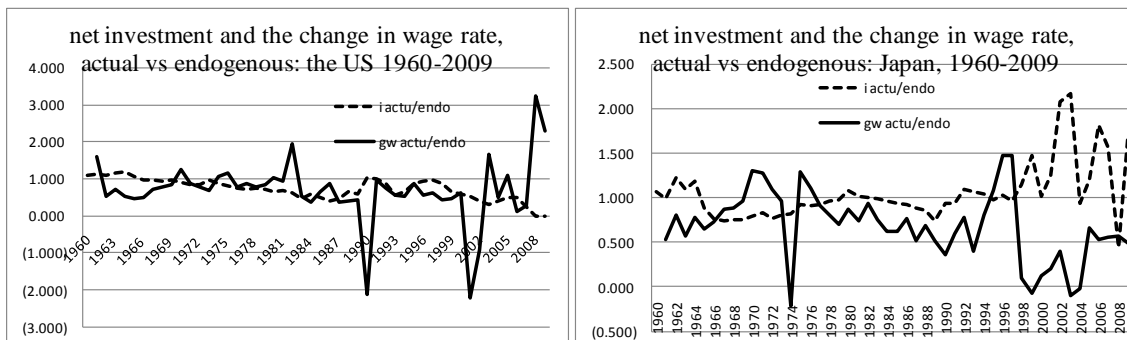
5. The market principle vividly exists in the long run; for example, ten year national debt yield,  $r_{M(DEBT)} = r_{M(10yrs)}$ , cannot be controlled arbitrarily. Yet, the market rate fluctuates when the real assets suddenly lose its essential robustness in equilibrium. Short-term speculative funds aim at these timing once or twice ten decade. If endogenous never be broken, such funds cannot be alive. Such funds, in a sense, has their existence, assuming that financial institutions' balance between capital and its endogenous valuation value of the real assets remains unchanged soon after bubbles and deficit is not used for that balance.



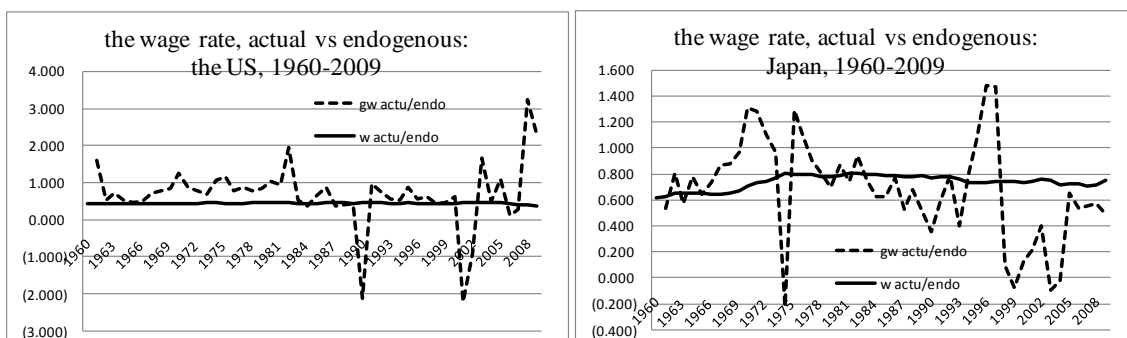
<sup>2</sup> This is shown by using the essence of the economic stage. At an early stage of developing,  $\beta^*$  is less than 0.5 and also the capital-output ratio is below 1.0. In this case,  $\delta_0$  has a few additional difficulties strongly influenced by endogenous equations. This was discussed at the *WEAI* Conference, San Diego on 1<sup>st</sup> of July, 2011, using 16 poor/developing countries.

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6. The wage rates, actual and endogenous, are essentially flexible. This is a wonderful finding and constitutes a trustworthy hypothesis among countries. Let the author compare actual with endogenous in the wage aspect. This is shown by using  $g_{w\text{ actu/endo}}$ , obtained from the actual wage index. And,  $g_{w\text{ actu/endo}}$  is tightly related to the relative net investment level,  $i_{\text{actu/endo}}$ . If  $i_{\text{actu/endo}}$  passes a difficult period(s),  $g_{w\text{ actu/endo}}$  works as an adjustor in the endogenous system.



7. When the actual wages are available at each country's national accounts, it is possible to compare  $g_{w\text{ actu/endo}}$  with the relative wage rate,  $w_{\text{actu/endo}}$ . Its  $g_{w\text{ actu/endo}}$  fluctuates by year to support the endogenous system but  $w_{\text{actu/endo}}$  is stable over decade. This fact shows that the actual wage rate and the endogenous wage rate go together or, the actual wage rate follows the endogenous wage rate. Even  $g_{w\text{ actu/endo}}$  follows  $w_{\text{actu/endo}}$ , as the central base. These imply that wages are flexible by nature.

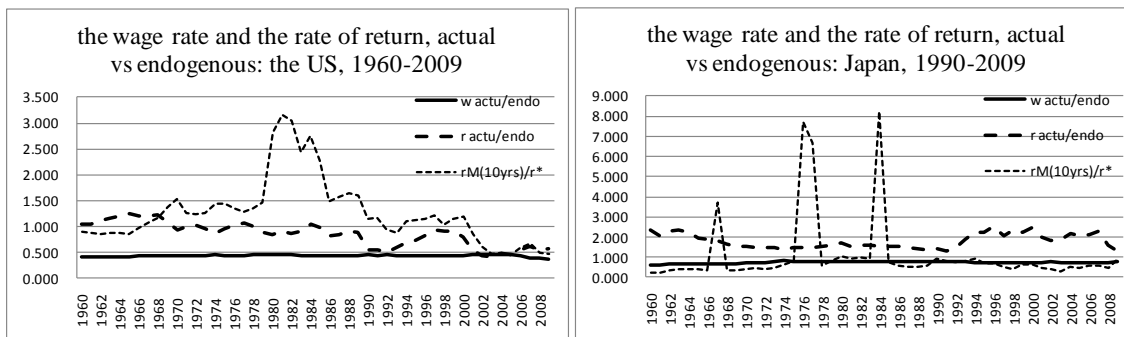


8. As a result, by taking into consideration the actual and endogenous rates of return, the relationship between wages and returns are clarified. It is true that the market rate even in the long term exaggerates its evaluation at disequilibrium period(s). At

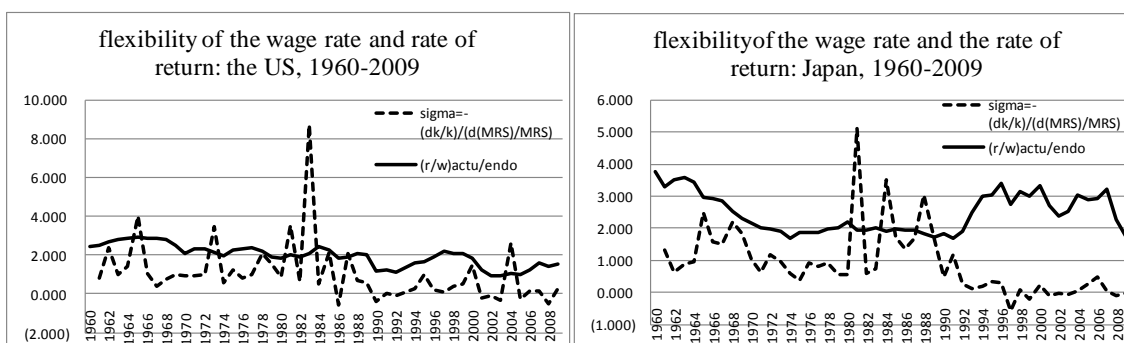
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peaceful periods, both  $w_{actu/endo}$  and  $r_{actu/endo}$  are surprisingly stable.



9. As a conclusion, the flexibility of the wage rate and the rate of return are shown, using the elasticity of substitution,  $\sigma$ . The author pointed out; the EU member countries are even stable almost two decades before 2008 as exposed by member countries.



The author does not refer to the exchange rate in this chapter; the exchange rate leads to another problem as discussed by Mundell, R. (1961). This problem was discussed at *Forum for Economists International*, Amsterdam, 24-25 Sep, 2011, using KEWT 5.11-2 and -3 (see chapter 5).

**Acknowledgements:** Grateful to welcome Permissions by Peter, van der Hoek, organizer of FEI, Amsterdam, similarly to Chapter 5. Peter is sincere and my teacher of study, behavior, and spirit.

For readers' convenience: contents of Tables and Figures hereunder

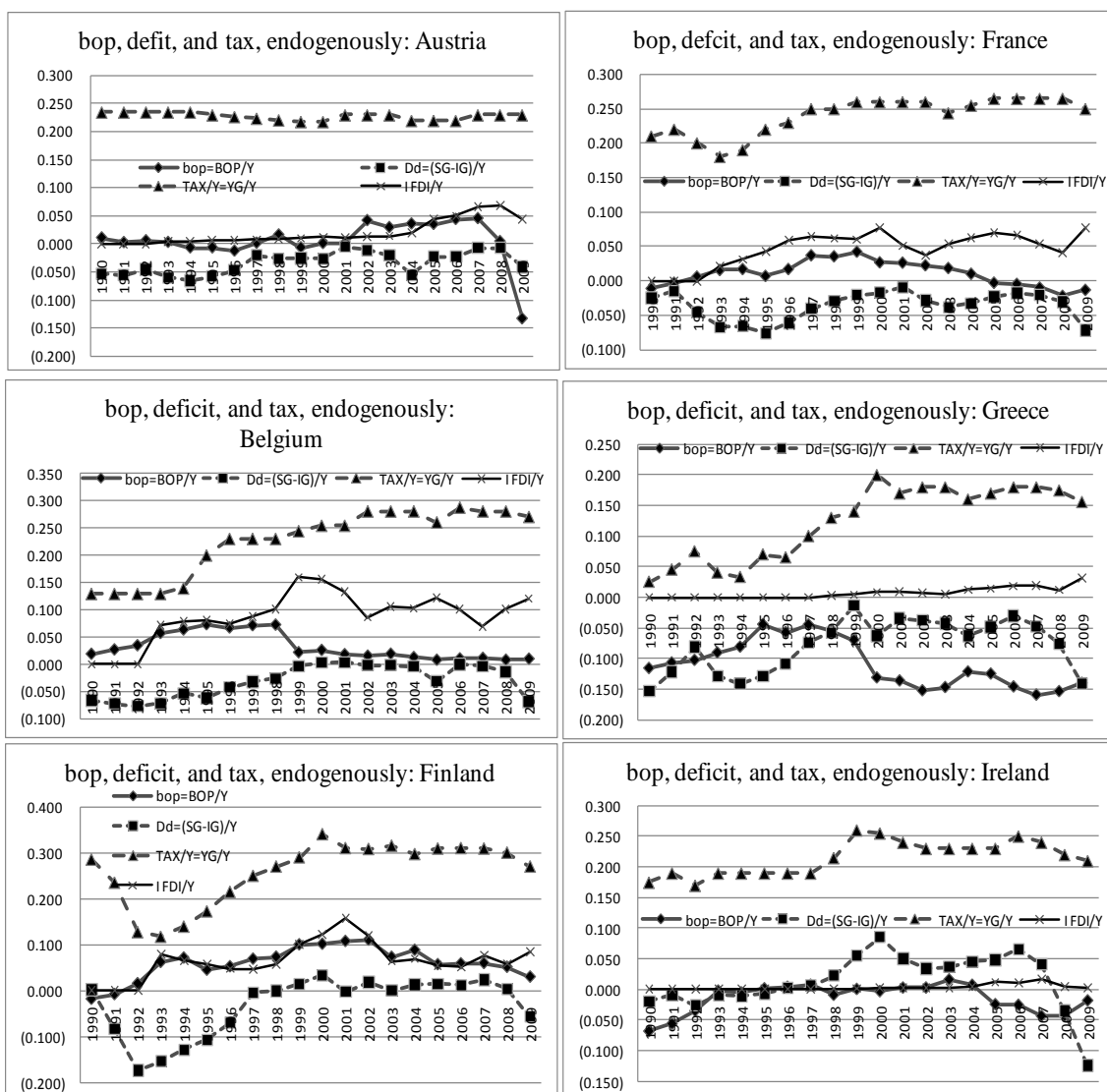
- Figure AE1 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (1)
- Figure AE2 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (2)
- Figure AE3 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (3)

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- Figure AE4 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (1)
- Figure AE5 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (2)
- Figure AE6 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (3)
- Figure AE7 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (4)
- Figure AE8 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (1)
- Figure AE9 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (2)
- Figure AE10 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (3)
- Figure F1 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (1)
- Figure F2 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (2)
- Figure F3 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (3)
- Figure F4 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (4)
- Figure F5 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (1)
- Figure F6 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (2)
- Figure F7 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (3)
- Figure F8 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (4)
- Figure F9 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (1)
- Figure F10 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (2)
- Figure F11 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (3)
- Figure F12 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (4)
- Figure F13 Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (5)

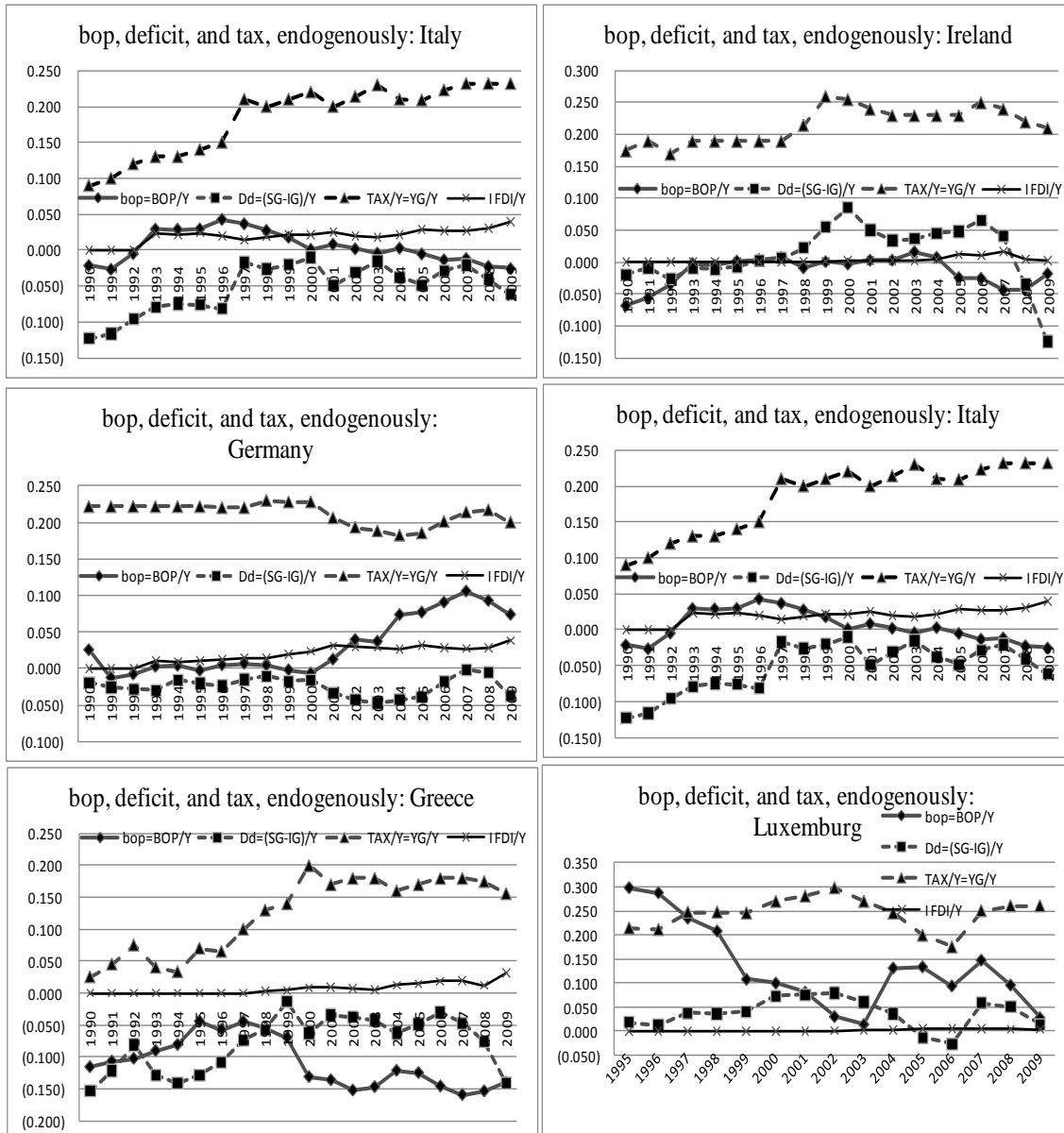
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



**Data source:** KEWT 5.11-2 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF

**Figure AE1** Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (1)

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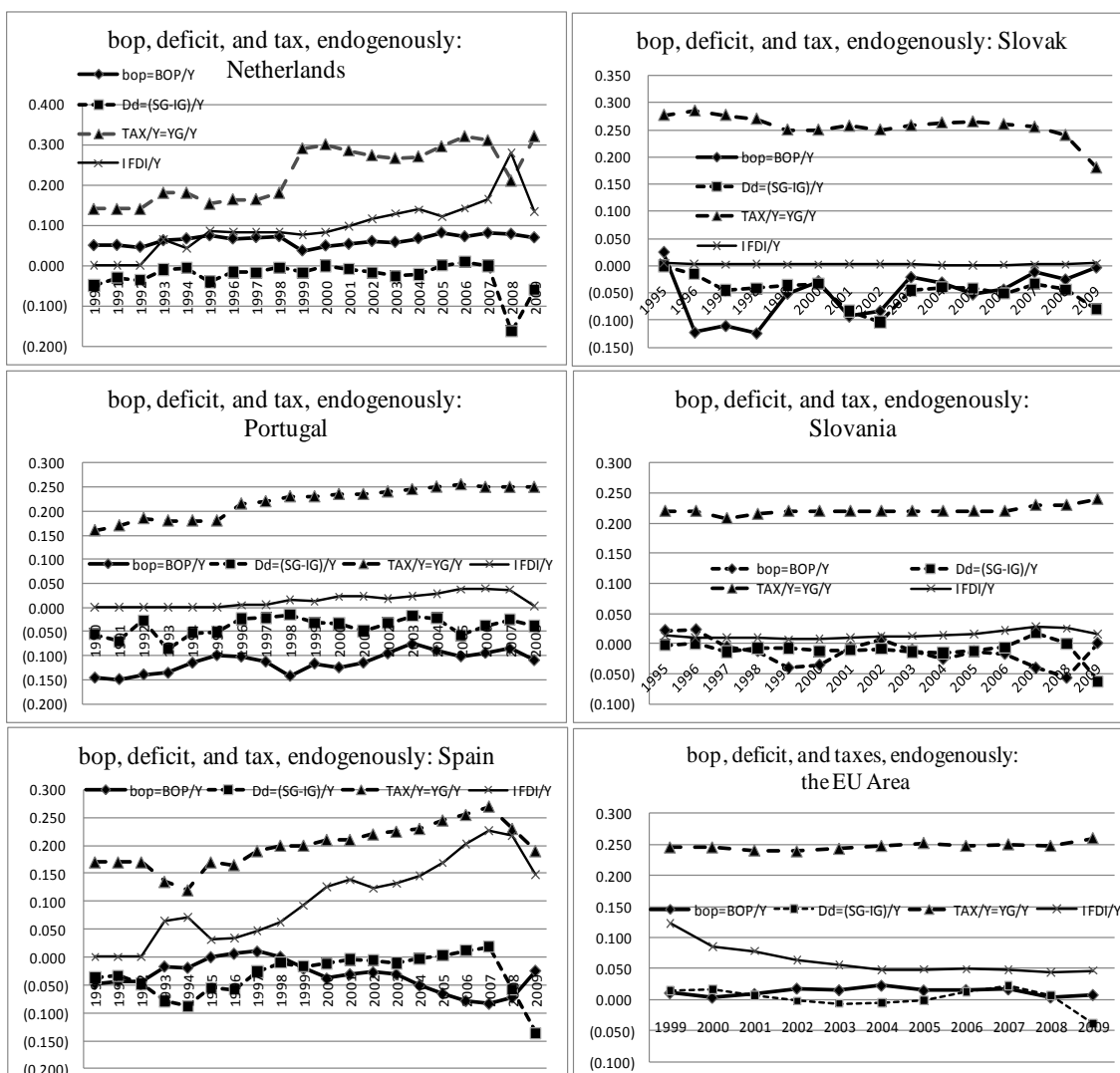


Data source: KEWT 5.11-2 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure AE2** Actual versus endogenous for net investment and wage rate flexibility: by country in 14-country EU Area (2)



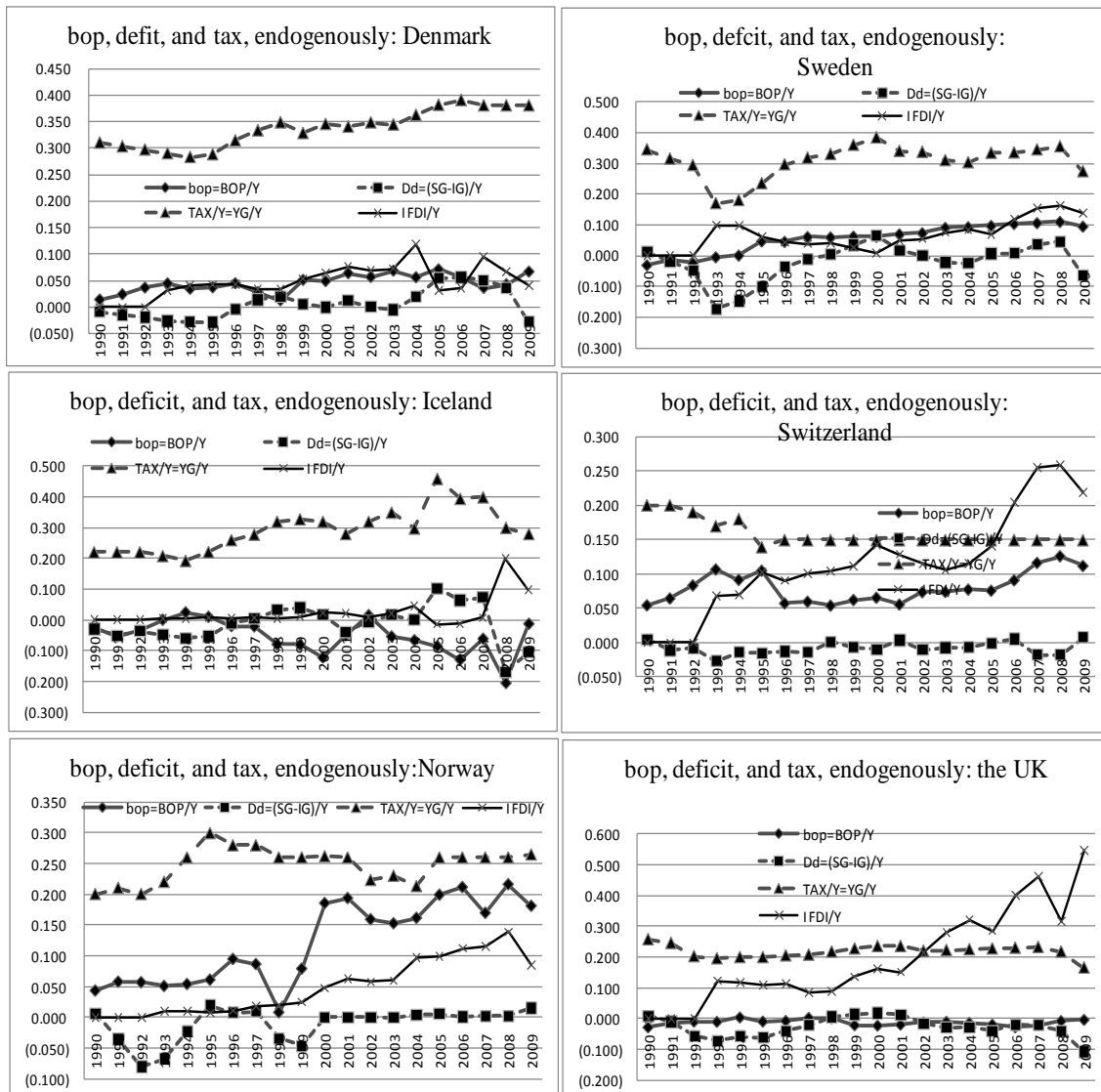
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



**Data source:** KEWT 5.11-2 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure AE3** Actual versus endogenous for net investment and wage rate flexibility: by country in 14-country EU Area (3)

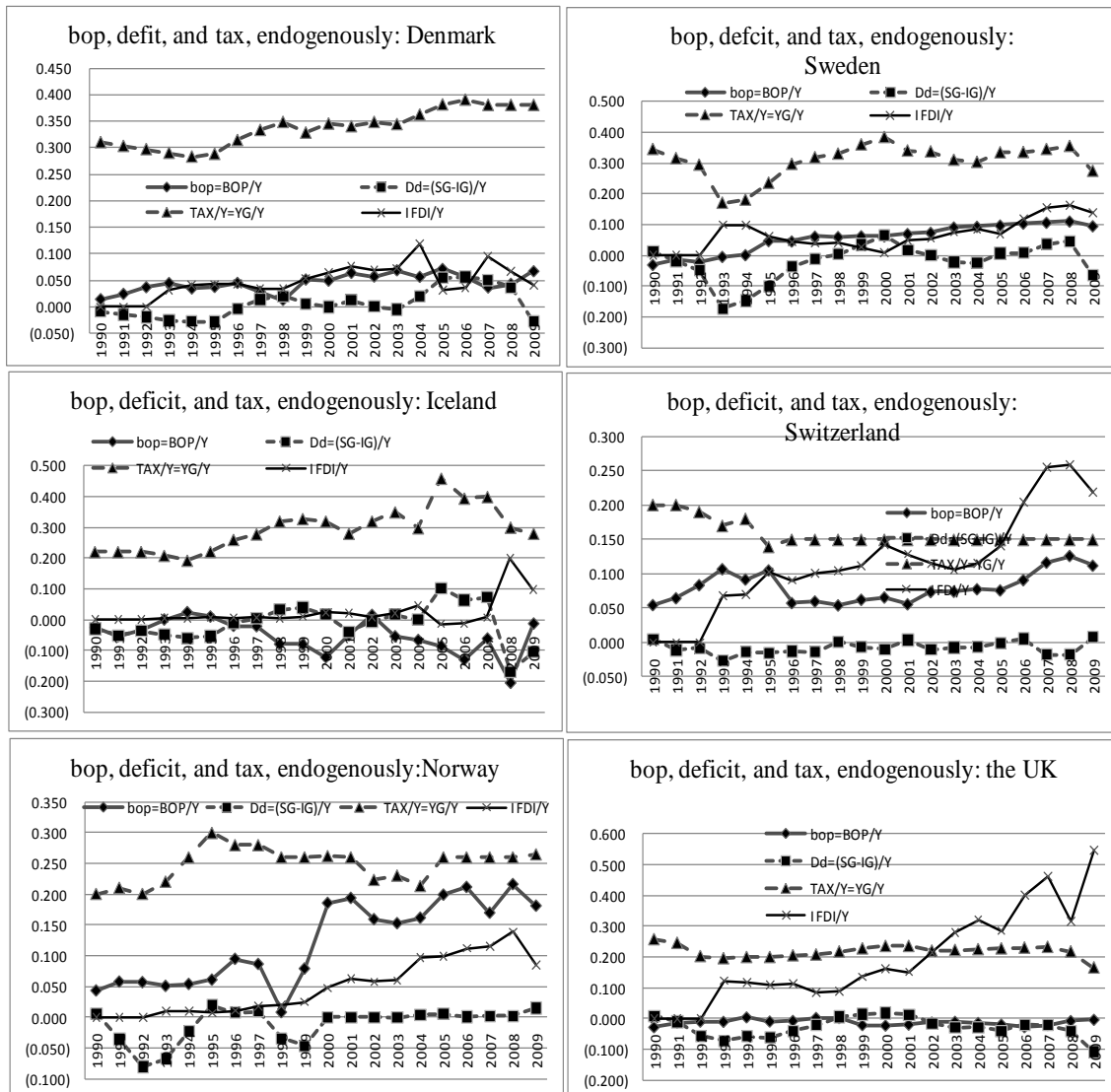
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Data source: KEWT 5.11-3 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure AE4** Actual versus endogenous for net investment and wage rate flexibility: by country in 15-country Europe Area (1)

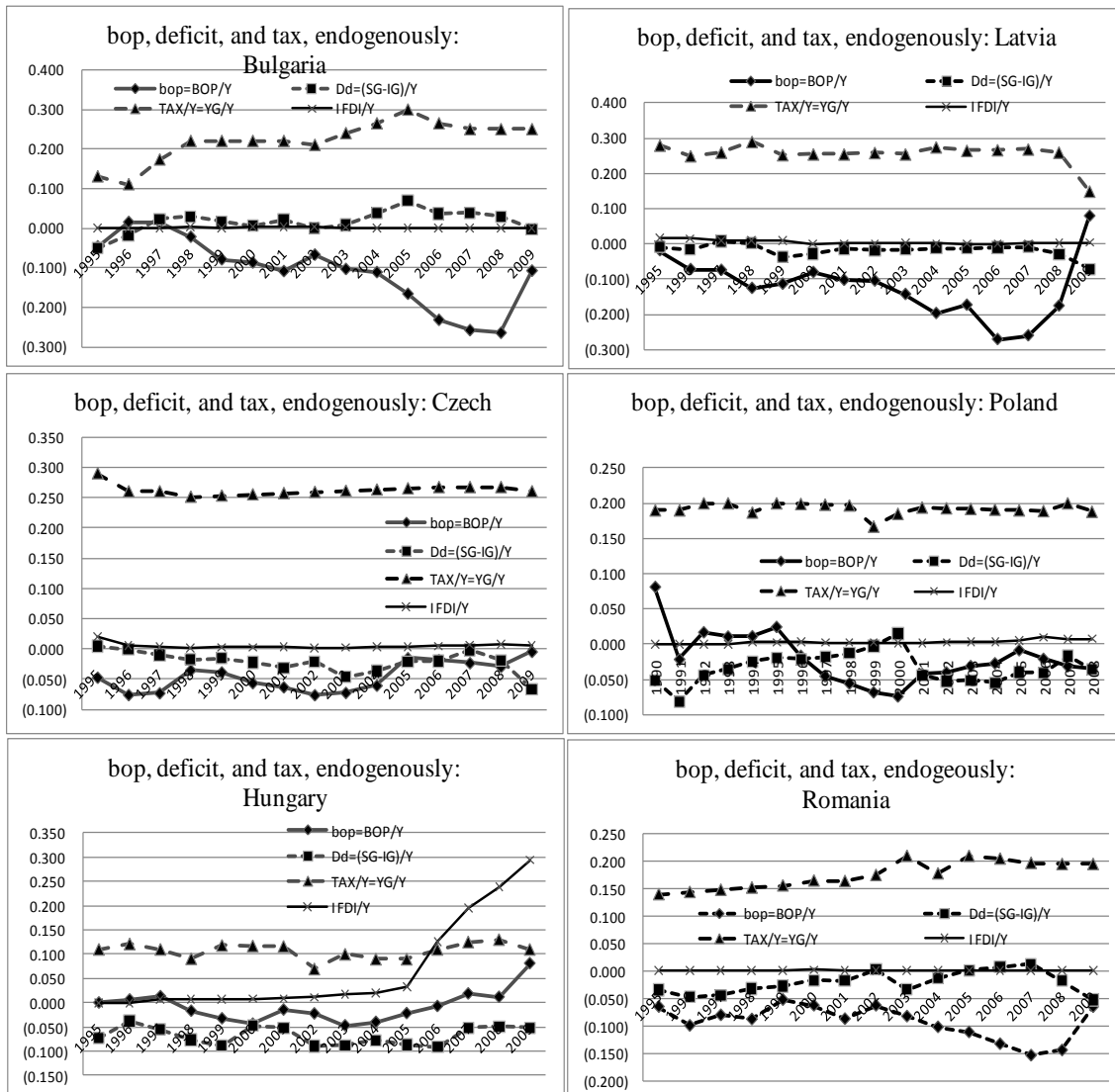
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



Data source: KEWT 5.11-3 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF

**Figure AE5** Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (2)

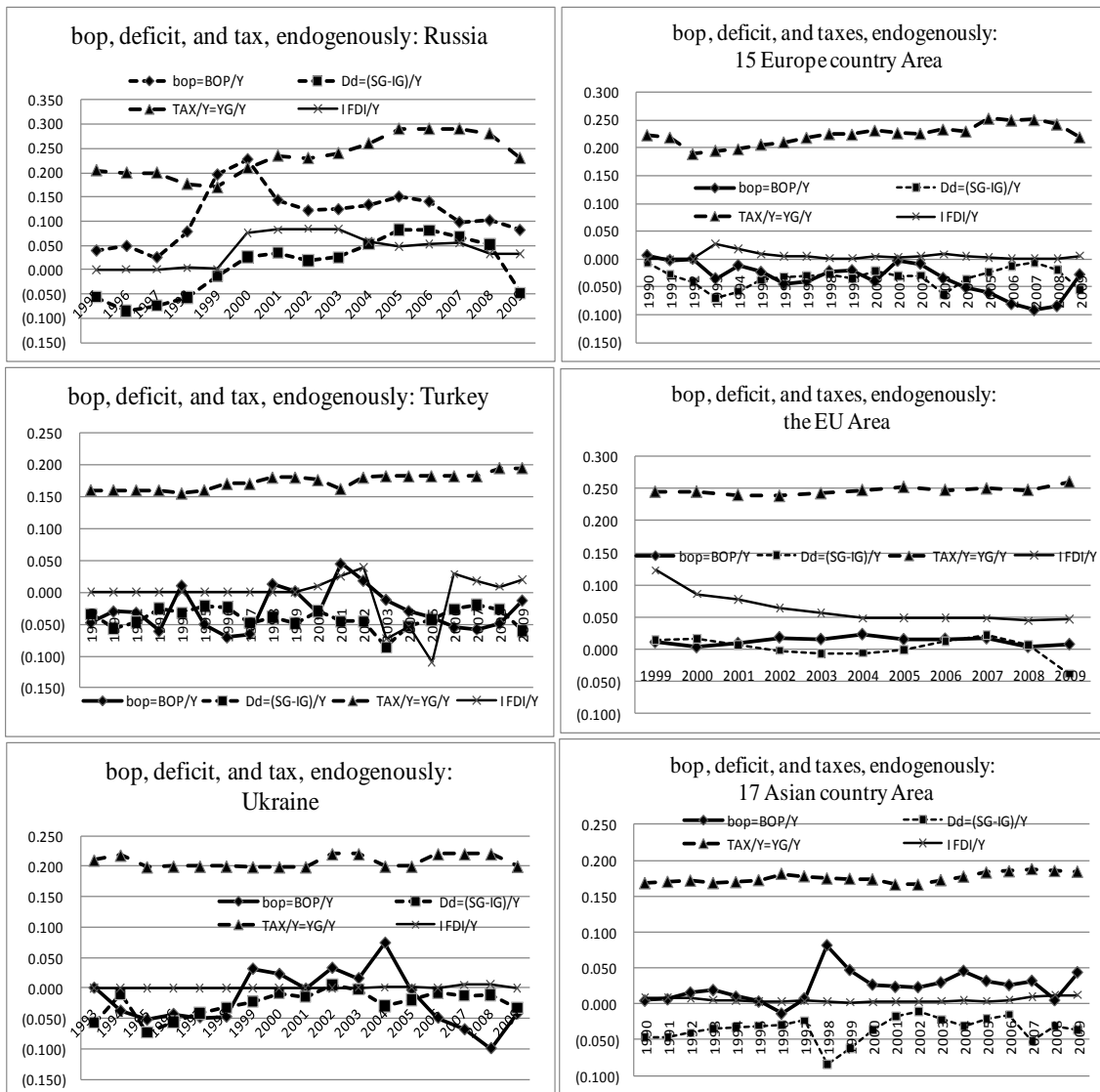
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Data source: KEWT 5.11-3 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF

**Figure AE6** Actual versus endogenous for net investment and wage rate flexibility: by country in 15-country Europe Area (3)

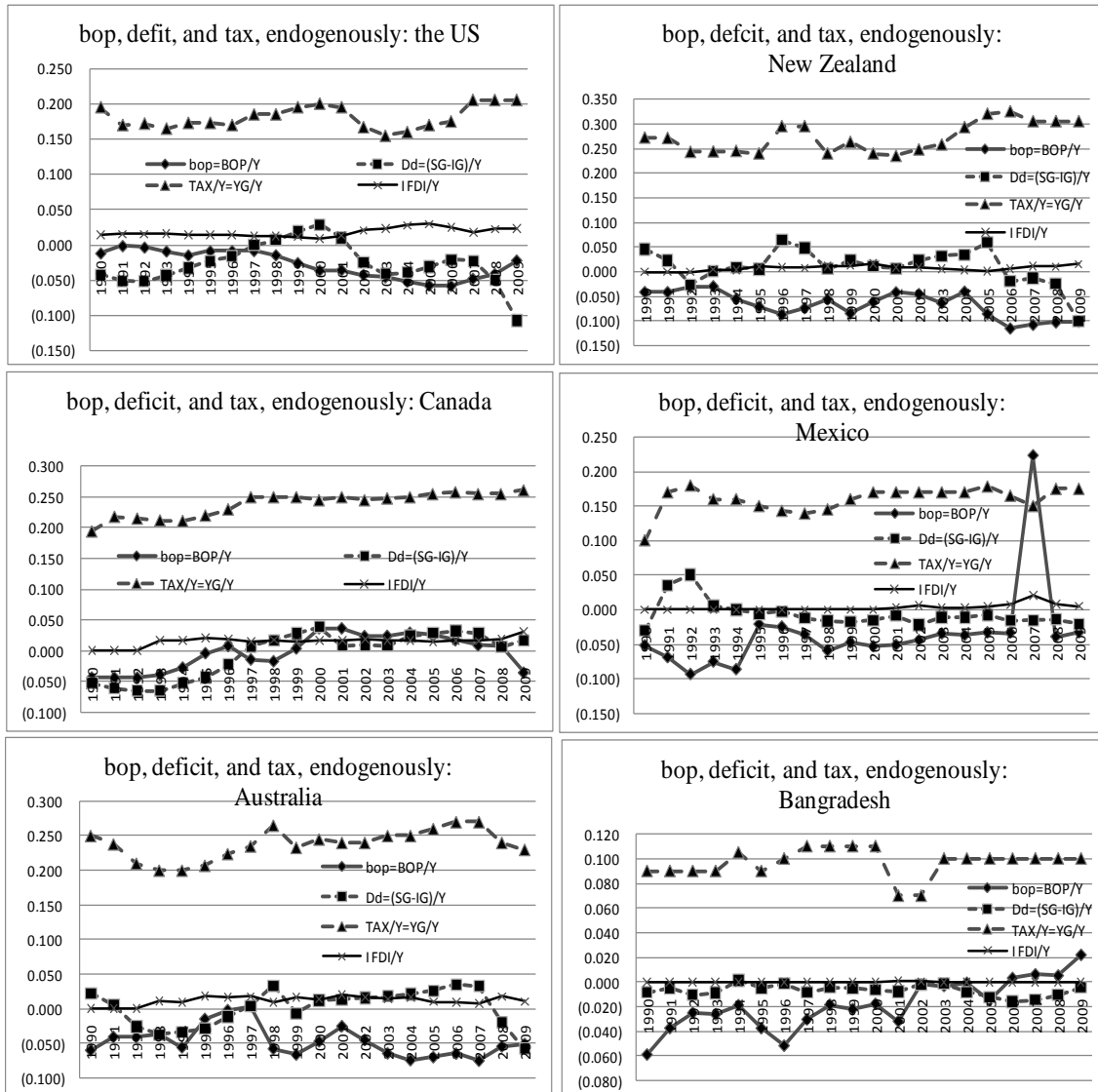
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



**Data source:** KEWT 5.11-3 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure AE7** Actual versus endogenous for net investment and wage rate flexibility: by country in 15-country Europe Area (4)

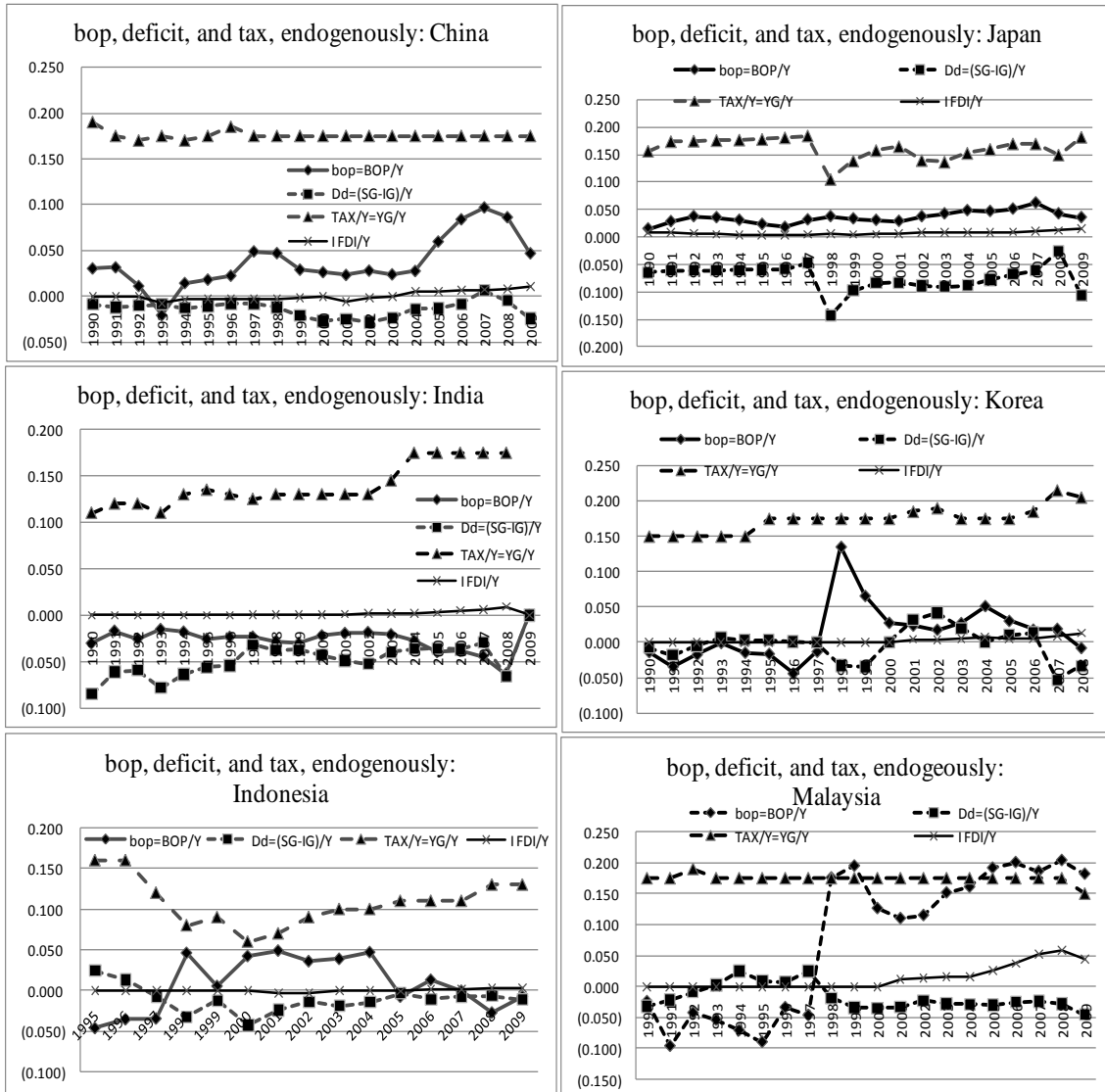
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Data source: KEWT 5.11-1 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure AE8** Actual versus endogenous for net investment and wage rate flexibility: by country in 17-country Pacific and Asia Area (1)

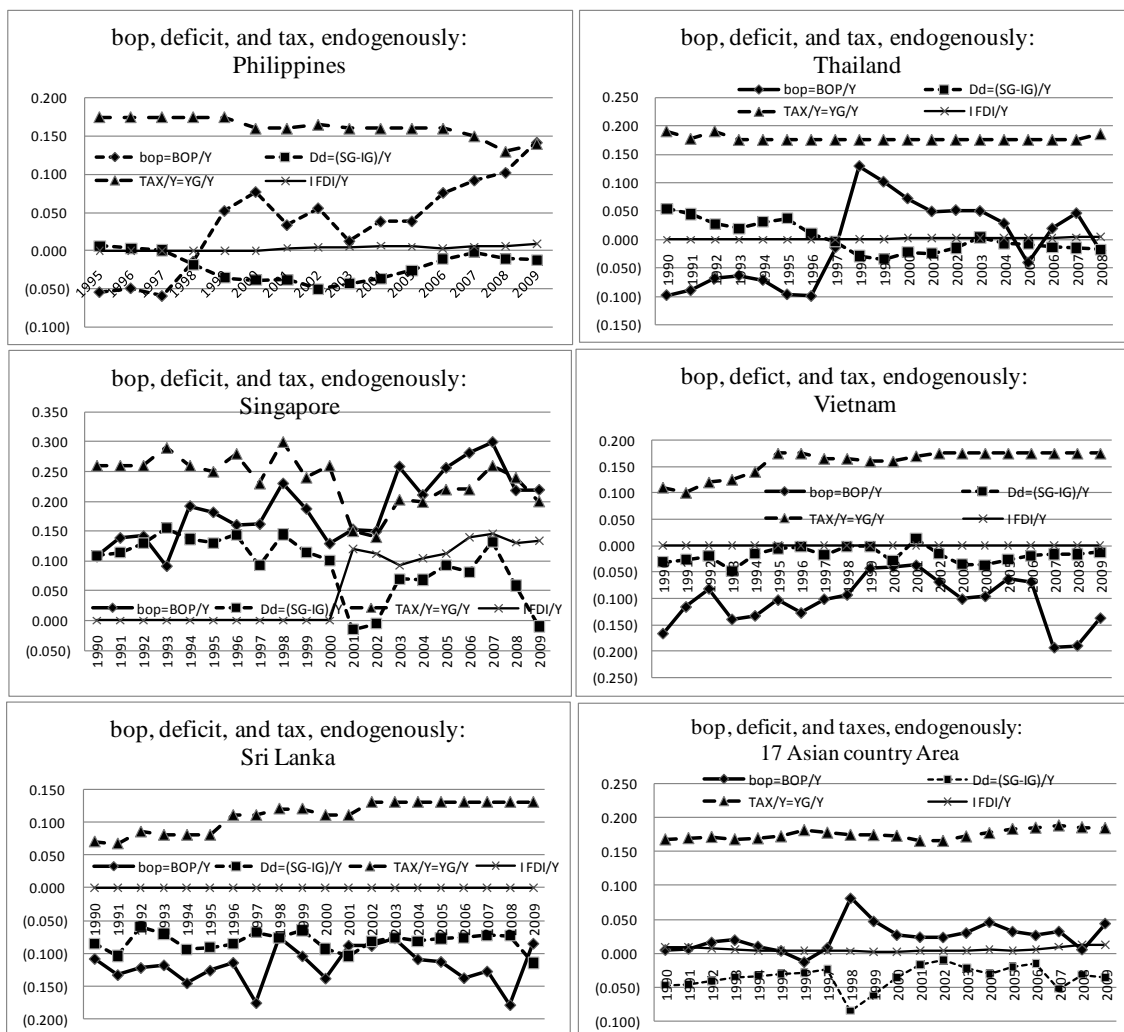
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



**Data source:** KEWT 5.11-1 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure AE9** Actual versus endogenous for net investment and wage rate flexibility: by country in 17-country Pacific and Asia Area (2)

## Chapter 9

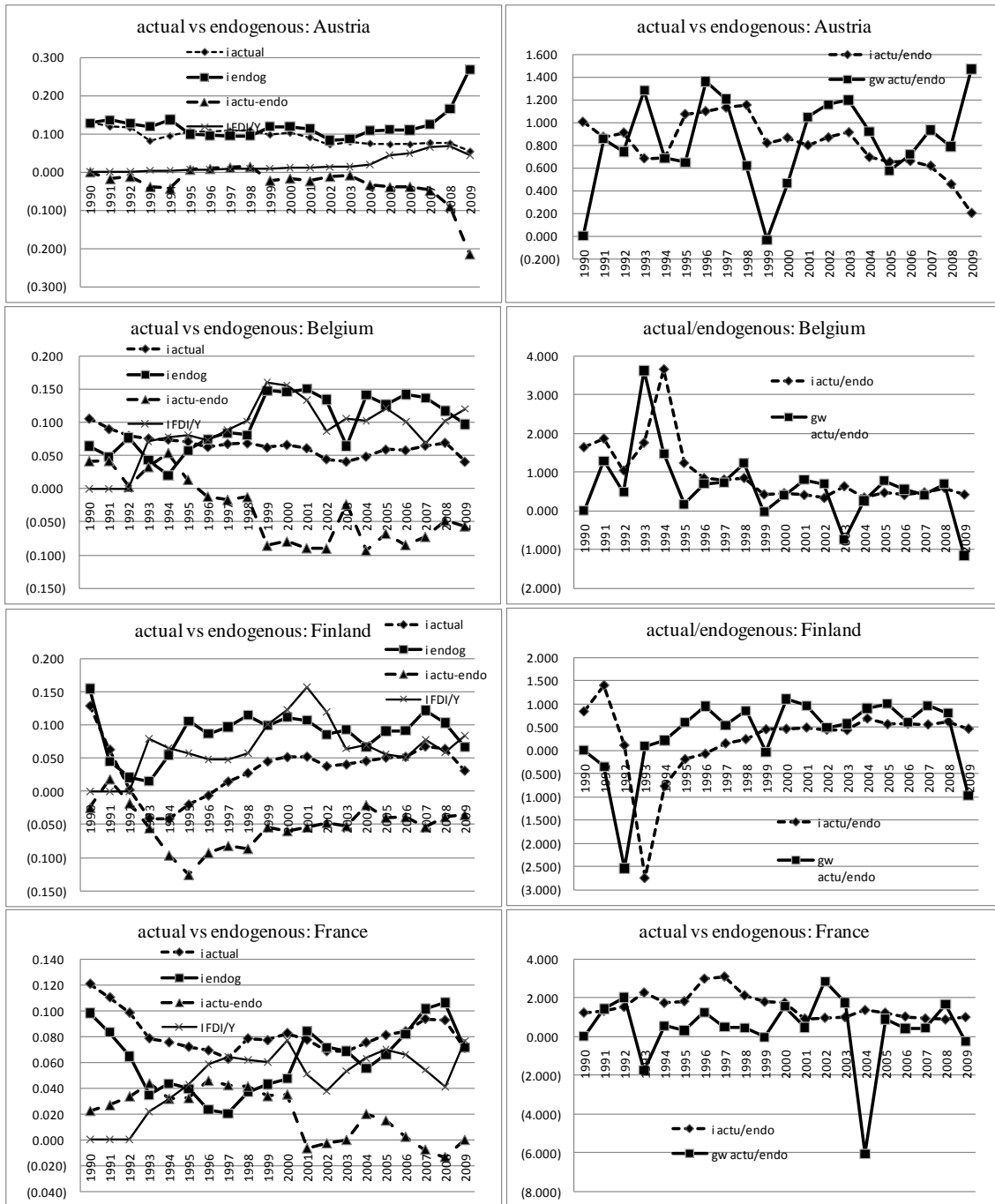


Data source: KEWT 5.11-1 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure AE10** Actual versus endogenous for net investment and wage rate flexibility: by country in 17-country Pacific and Asia Area (3)



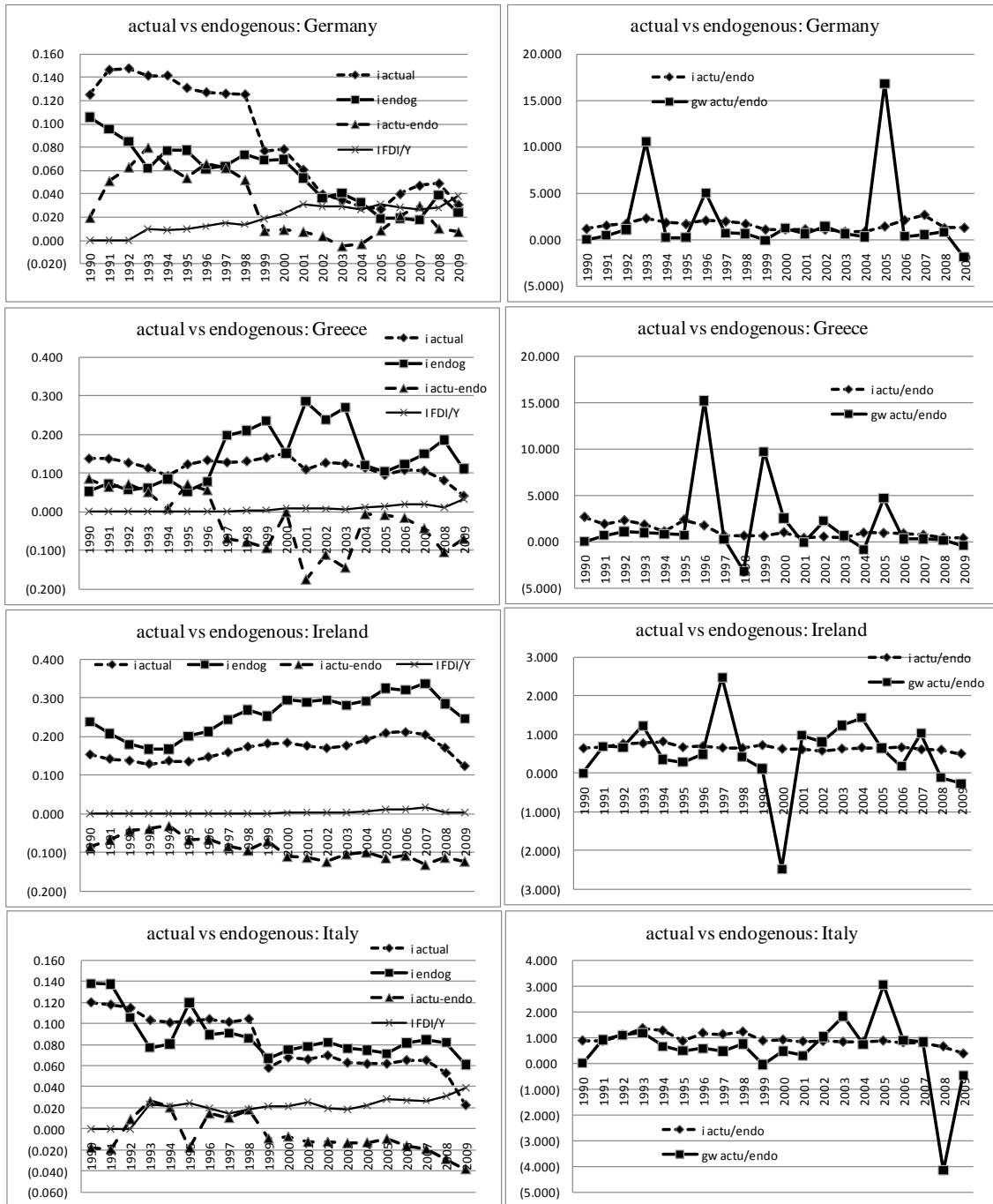
# Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



**Data source:** KEWT 5.11-2 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F1** Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (1)

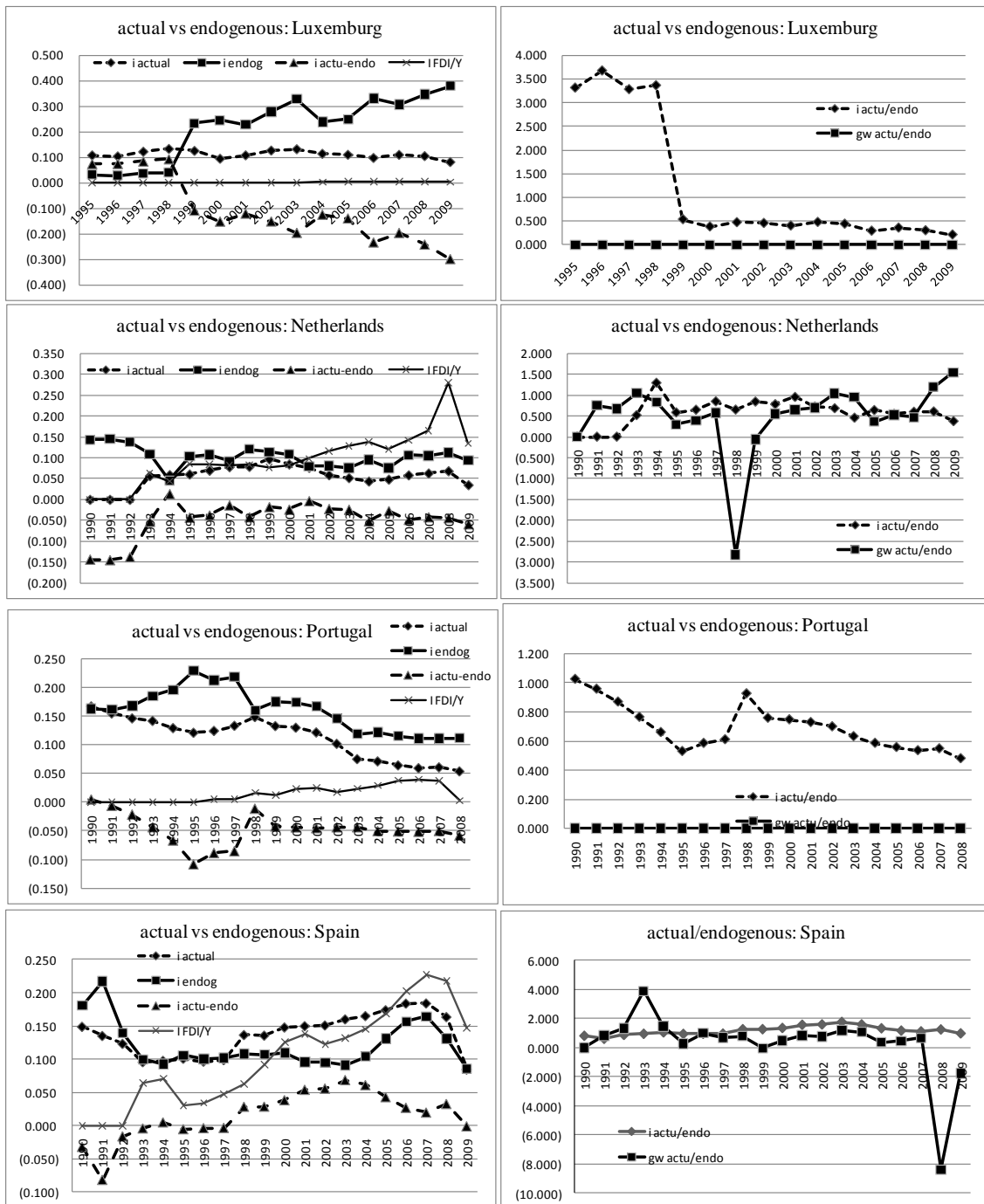
## Chapter 9



Data source: KEWT 5.11-2 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F2** Actual versus endogenous for net investment and wage rate flexibility: by country in 14-country EU Area (2)

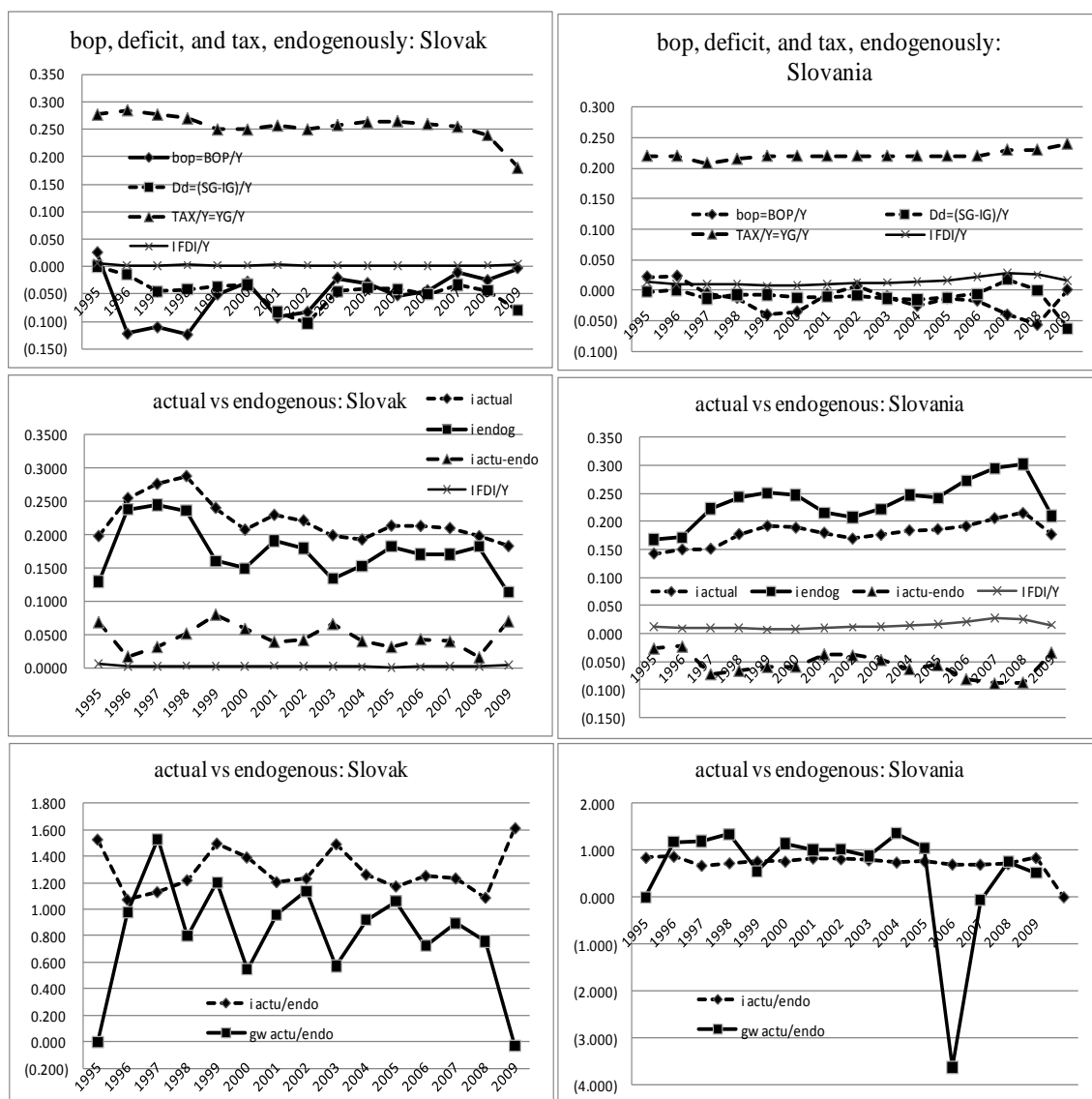
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



Data source: KEWT 5.11-2 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F3** Actual versus endogenous for net investment and wage rate flexibility:  
by country in 14-country EU Area (3)

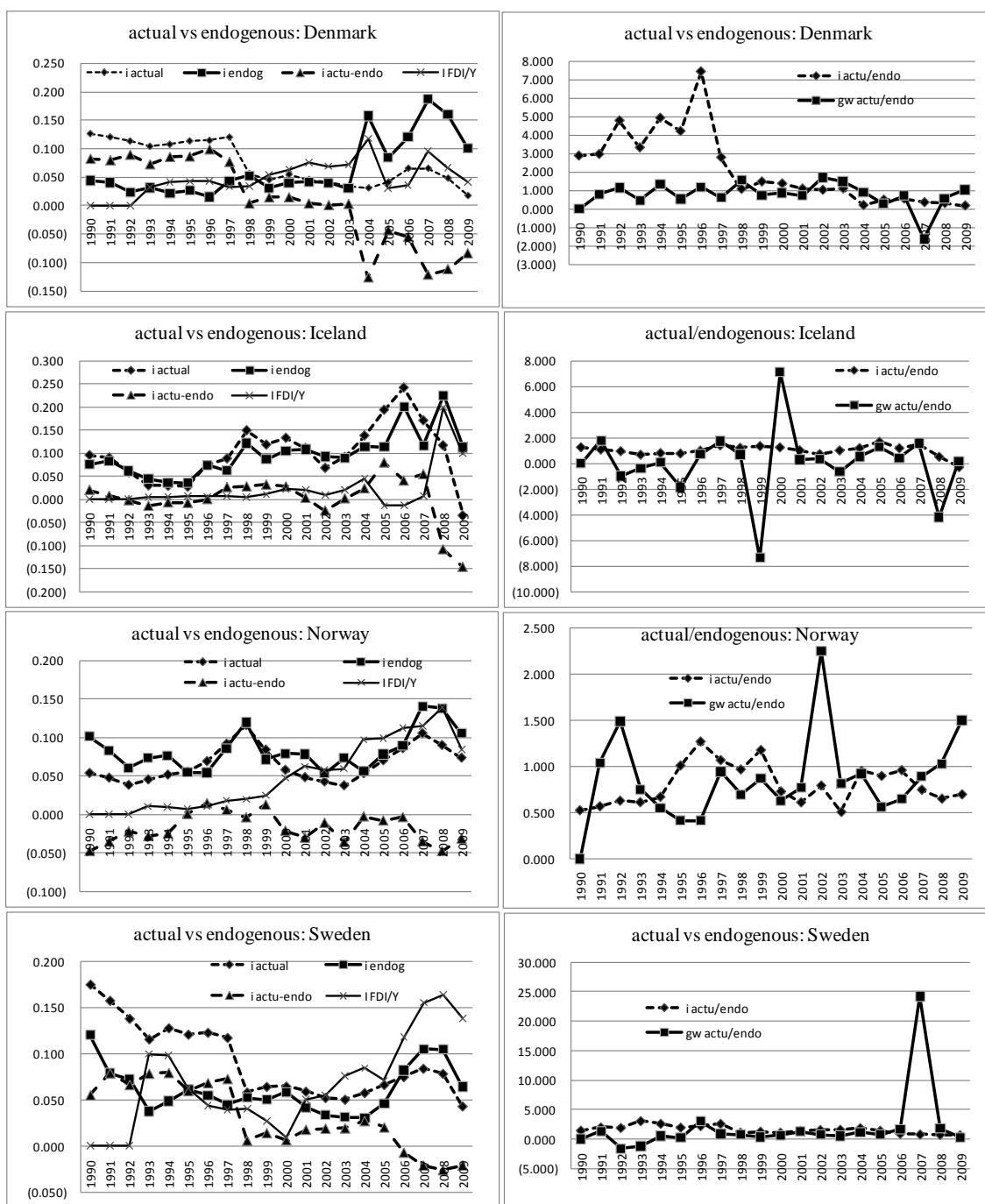
## Chapter 9



**Data source:** KEWT 5.11-2 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF

**Figure F4** Actual versus endogenous for net investment and wage rate flexibility: by country in 14-country EU Area (4)

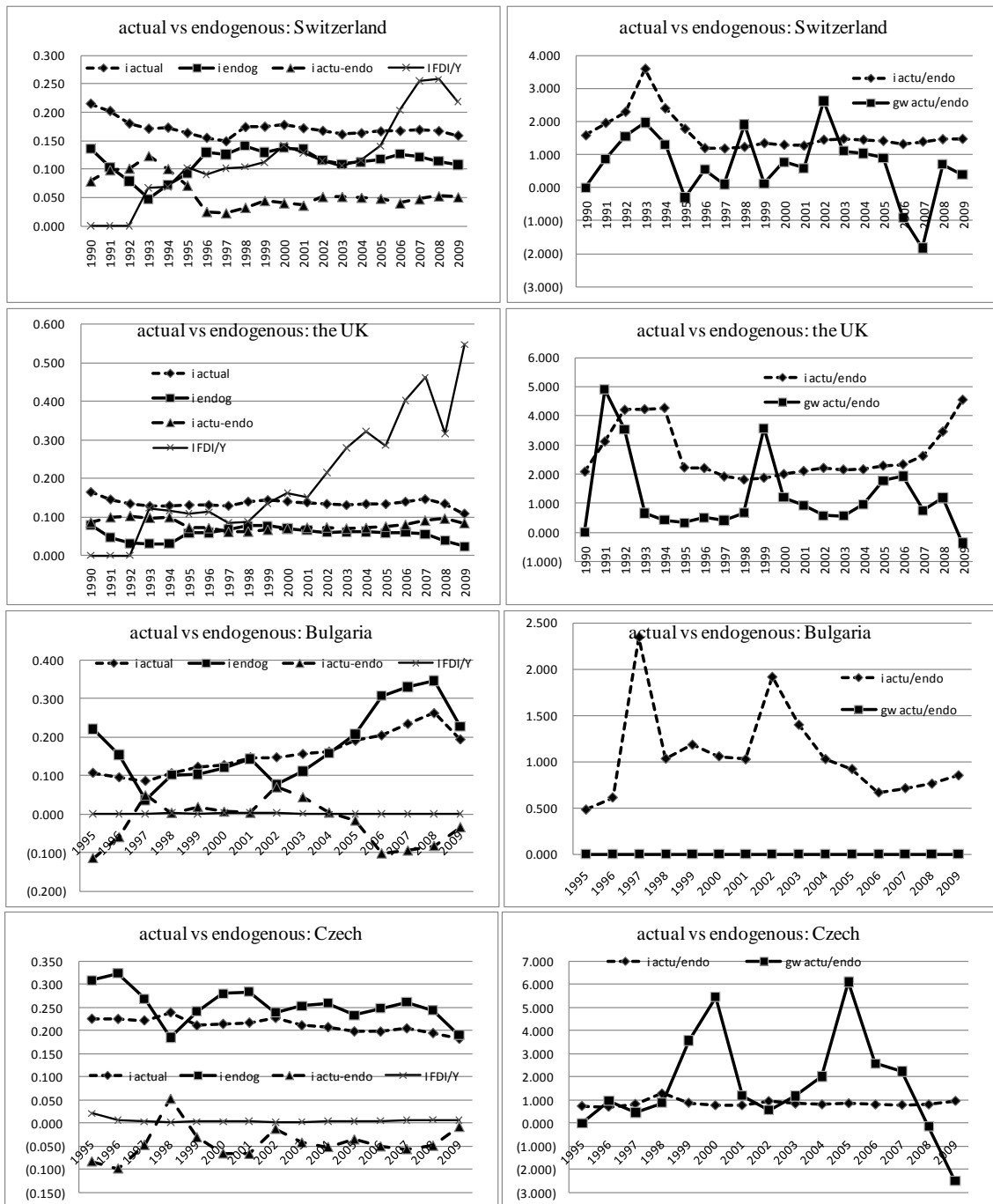
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



Data source: KEWT 5.11-3 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F5** Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (1)

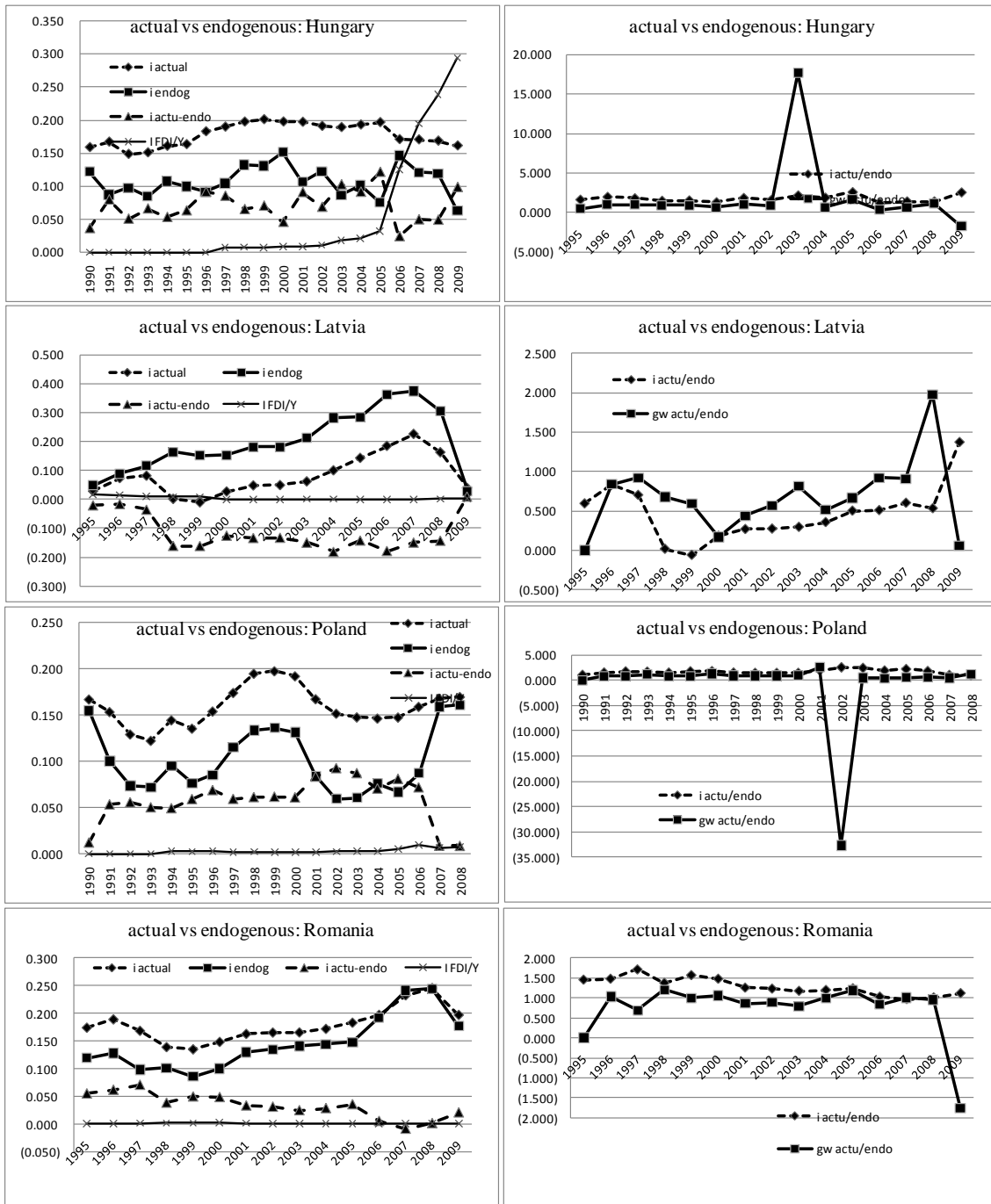
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Data source: KEWT 5.11-3 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F6** Actual versus endogenous for net investment and wage rate flexibility: by country in 15-country Europe Area (2)

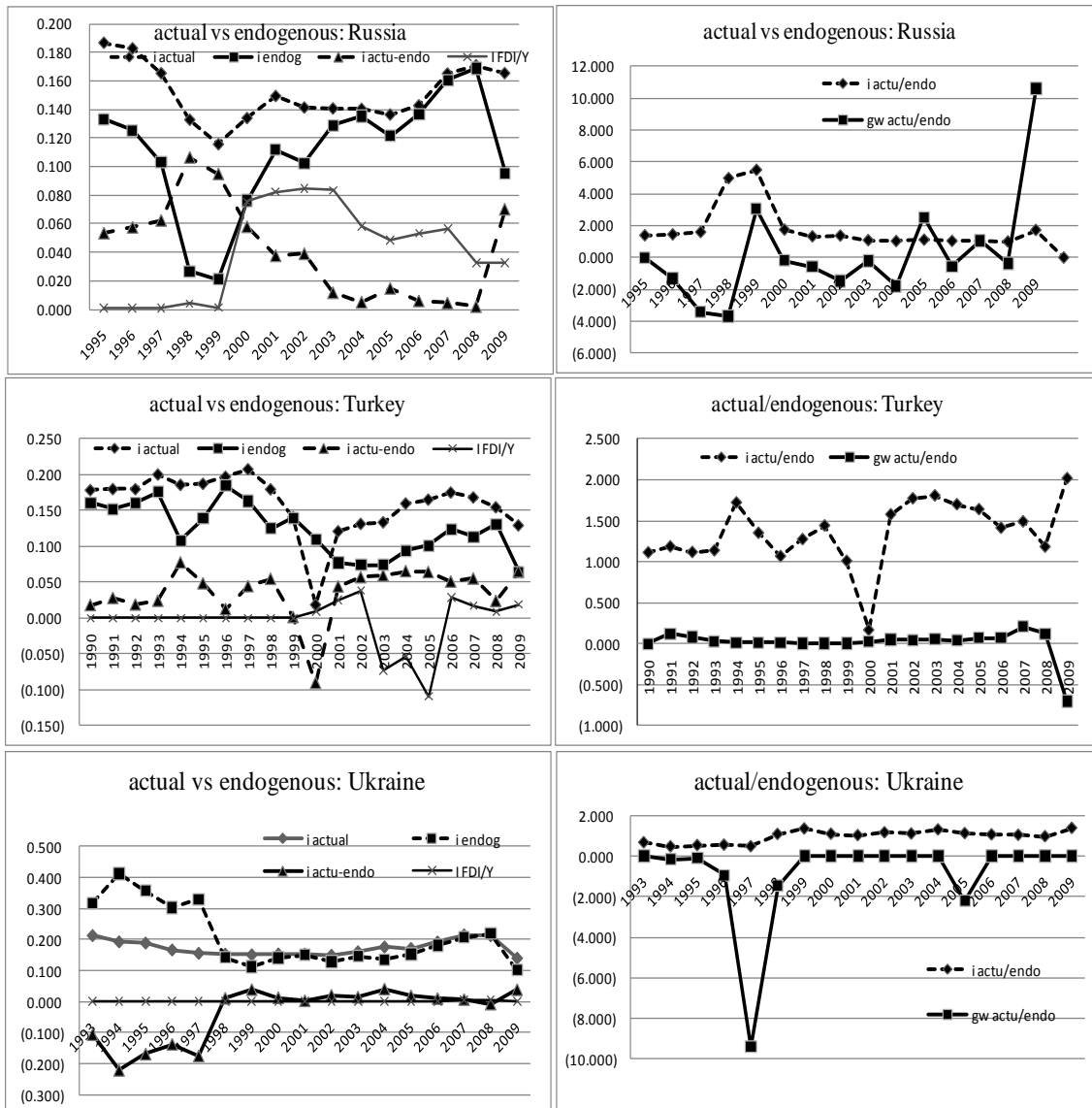
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



**Data source:** KEWT 5.11-3 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F7** Actual versus endogenous for net investment and wage rate flexibility:  
by country in 15-country Europe Area (3)

## Chapter 9

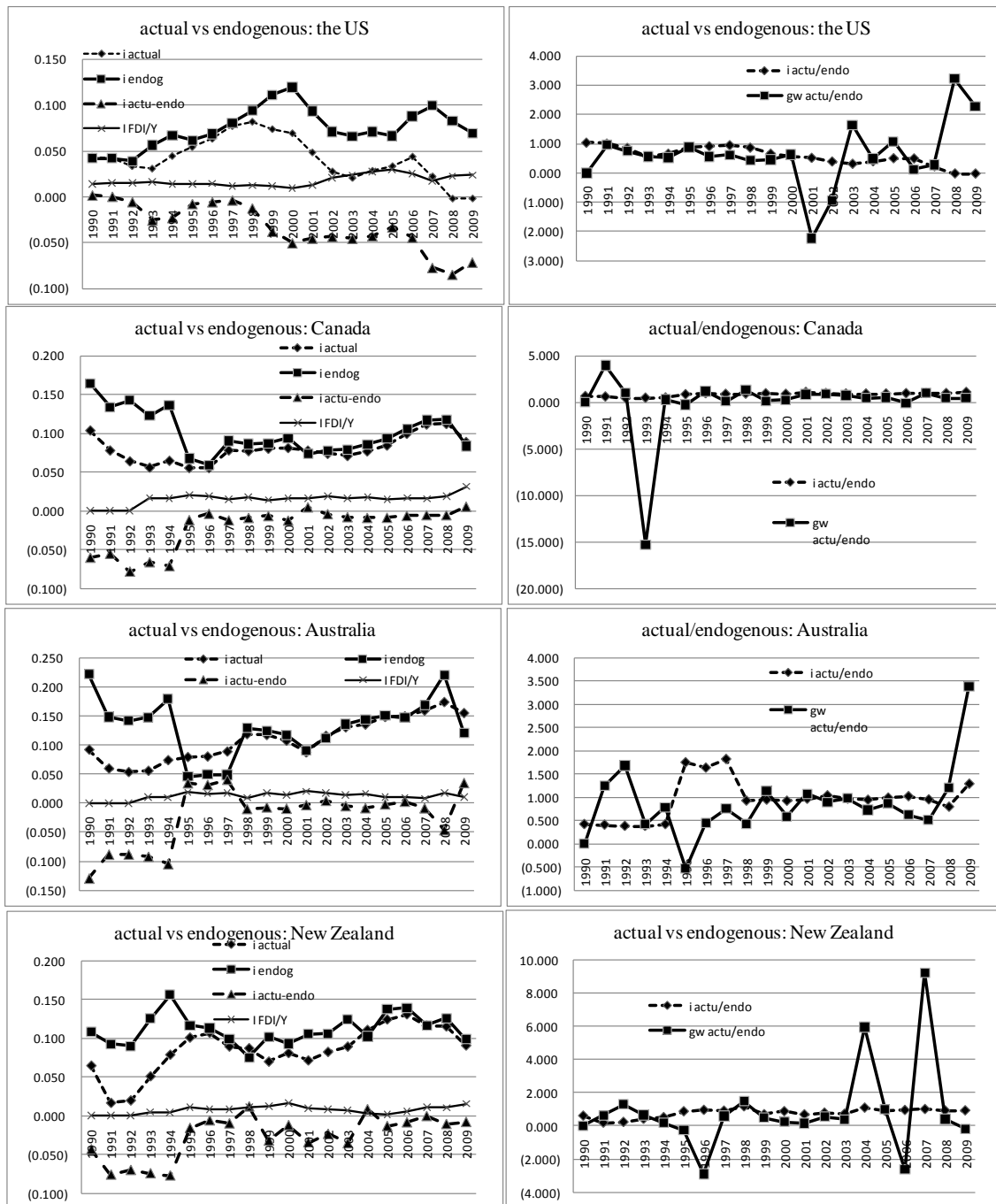


**Data source:** KEWT 5.11-3 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F8** Actual versus endogenous for net investment and wage rate flexibility: by country in 15-country Europe Area (4)



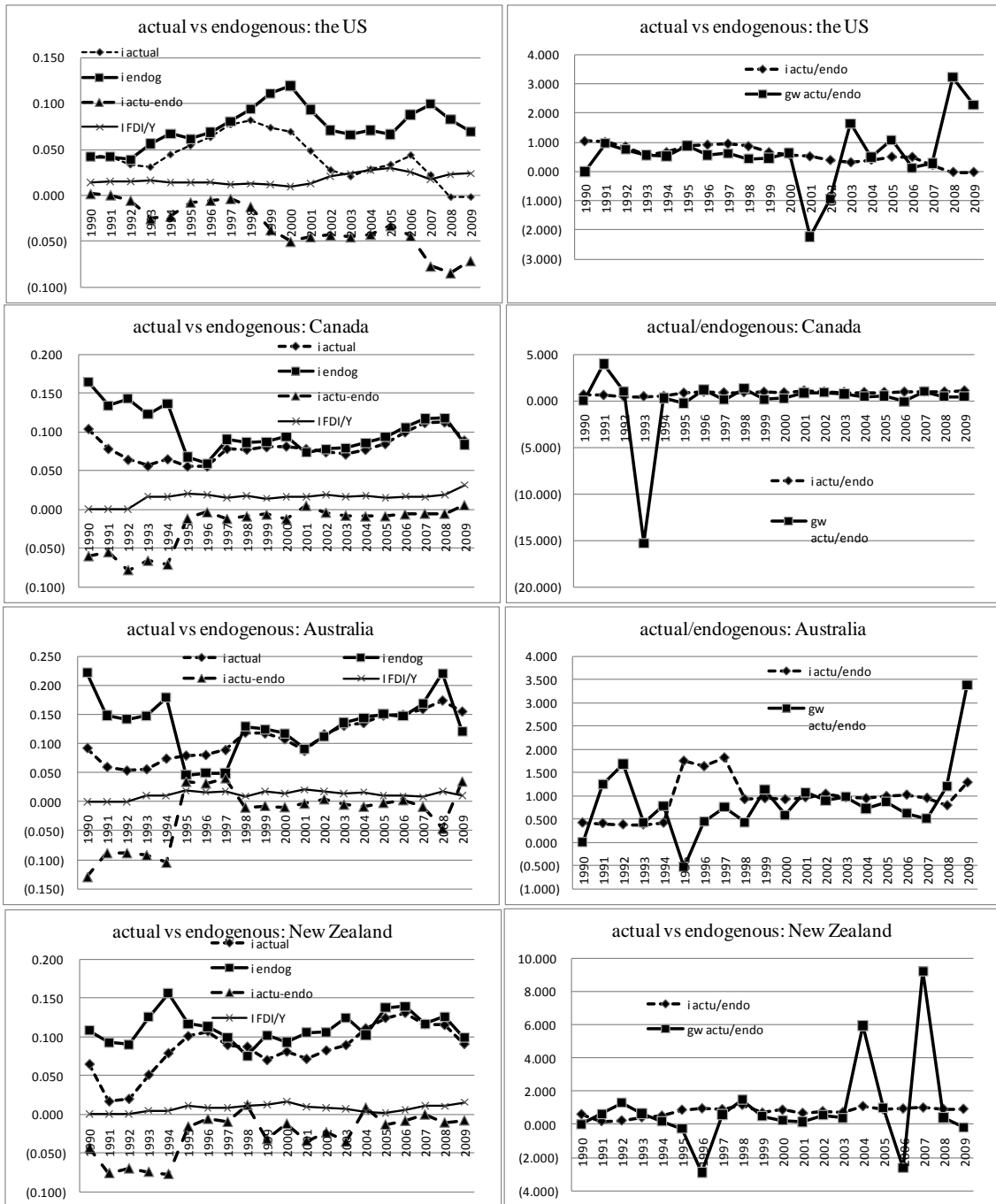
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



Data source: KEWT 5.11-1 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F9** Actual versus endogenous for net investment and wage rate flexibility:  
by country in 17-country Pacific and Asia Area (1)

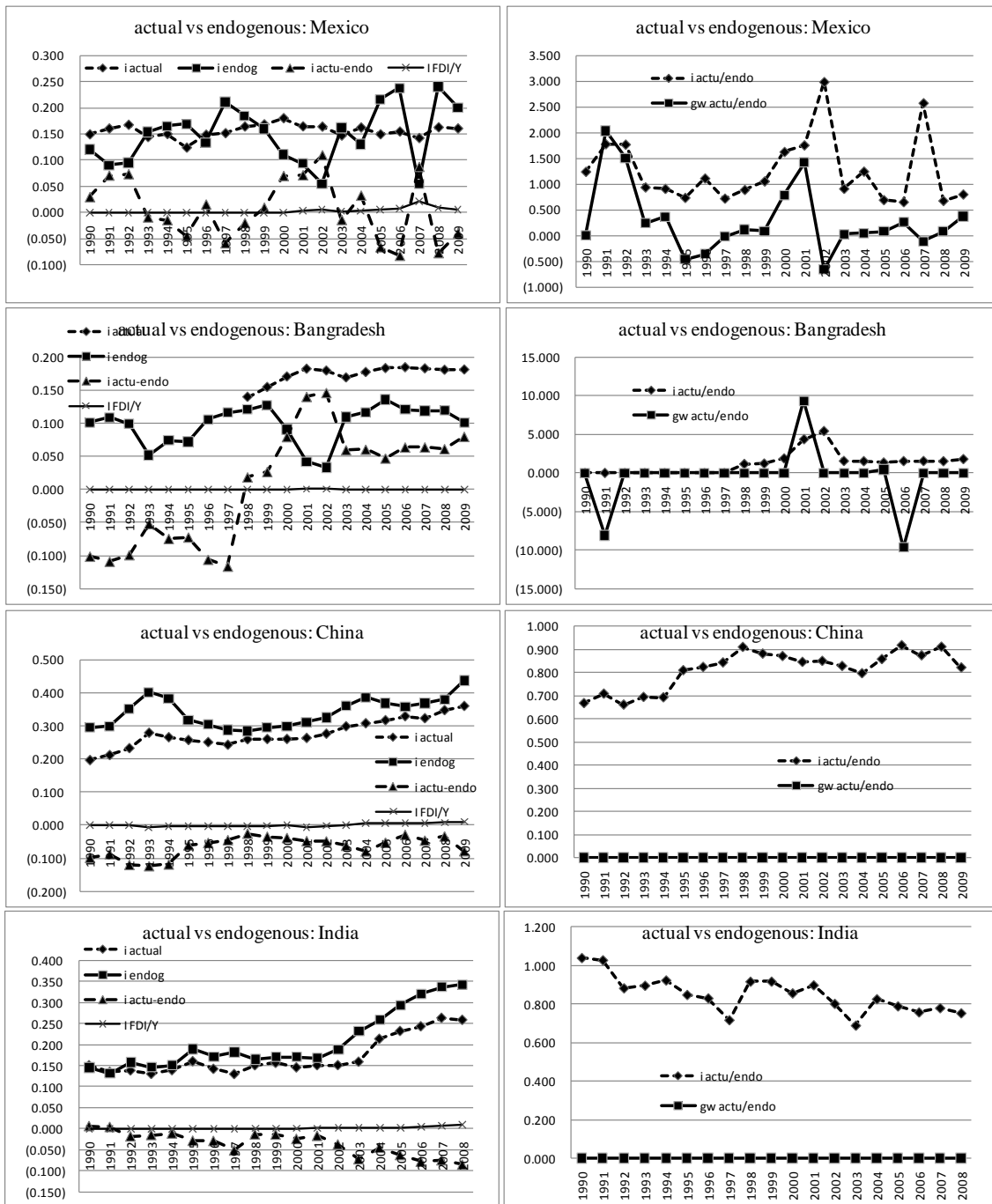
# Chapter 9



Data source: KEWT 5.11-1 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F10** Actual versus endogenous for net investment and wage rate flexibility: by country in 17-country Pacific and Asia Area (2)

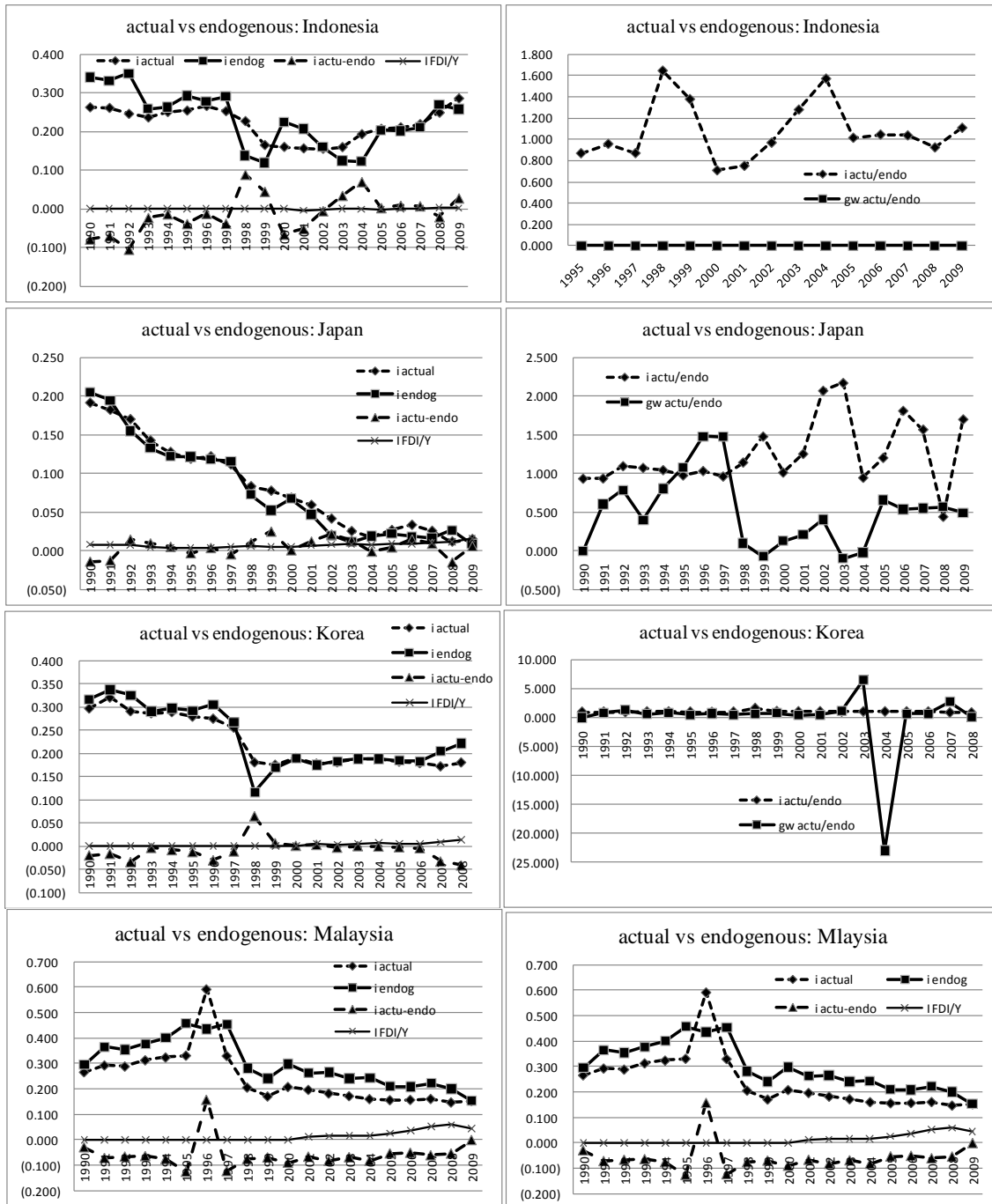
## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



Data source: KEWT 5.11-1 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F11** Actual versus endogenous for net investment and wage rate flexibility: by country in 17-country Pacific and Asia Area (3)

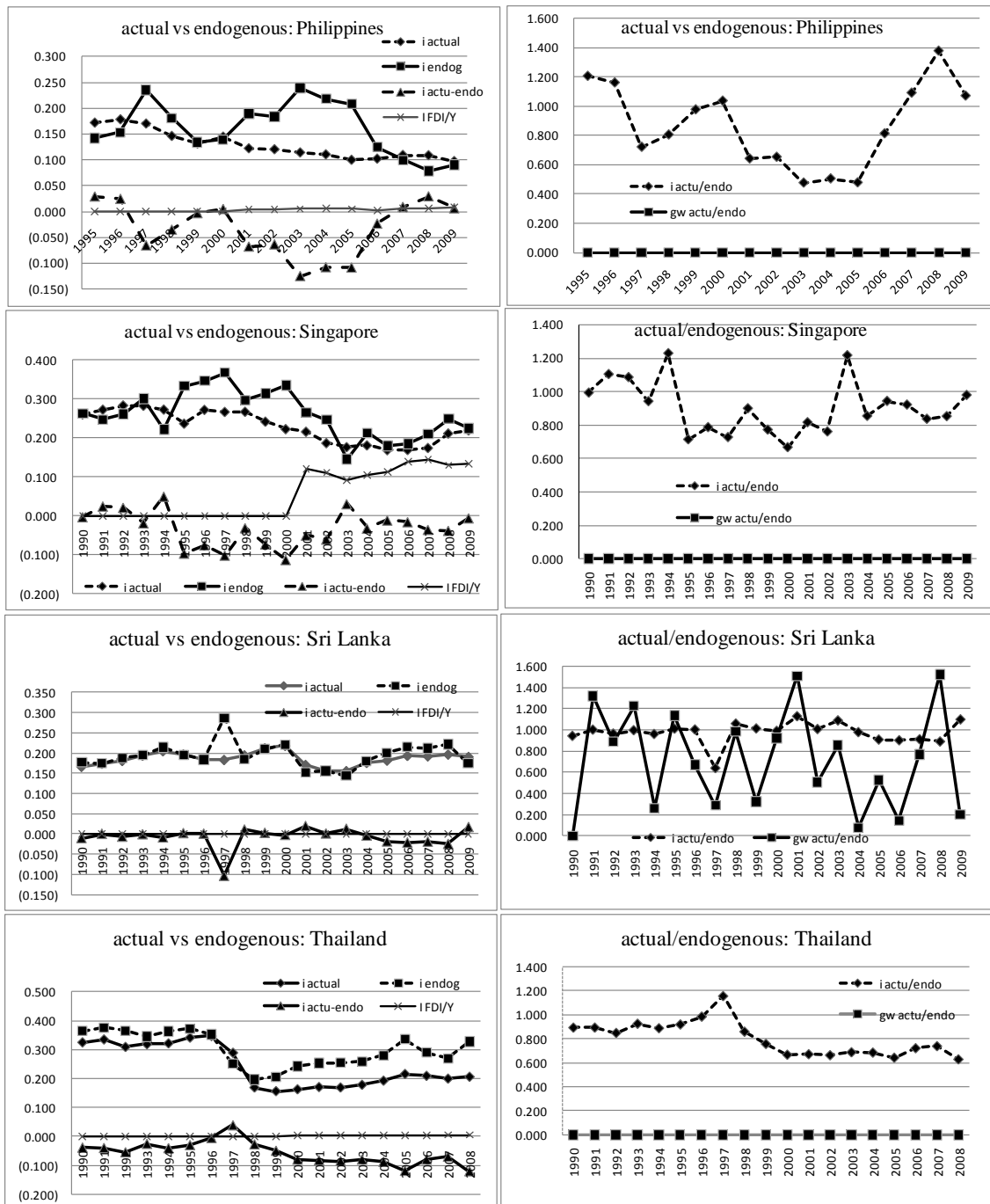
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Data source: KEWT 5.11-1 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F12** Actual versus endogenous for net investment and wage rate flexibility: by country in 17-country Pacific and Asia Area (4)

## Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium



Data source: KEWT 5.11-1 by sector, 1990-2009, whose original data are from *International Financial Statistics Yearbook*, IMF.

**Figure F13** Actual versus endogenous for net investment and wage rate flexibility: by country in 17-country Pacific and Asia Area (5)

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