Empirical Proof of the Flexibility of the Wage Rate and the Rate of Return in Endogenous Equilibrium: Using KEWT 5.11 by Sector, 1990–2009

Hideyuki Kamiryo

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Abstract

This paper tests endogenous flexibility of the wage rate and the rate of return in equilibrium, using 46 country data-sets in KEWT 5.11, and compares these levels with those in actual IMF statistics. The author finds that the endogenous data and actual data go together in parallel by country and that actual data cannot be apart from endogenous data beyond a certain limit by country. When a country loses the control between actual and endogenous data, the country falls into disequilibrium, which results in financial crisis. In fact, some countries have experienced a few times or several times disequilibrium for the last twenty years. Disequilibrium is the cause of the inflexibility of the wage rate and the rate of return. If the flexibility of the wage rate and the rate of return holds, a country is able to control and manages an economy. It implies that if a country maintains endogenous equilibrium, the real assets are able to control the financial and market assets, within certain levels of the balance of payments and budgetary deficit. Sung Won Sohn asserts that the EU Area must be divided into two sub-areas or that undervalued Germany should leave the EU, based on Mundell's theory (1961), denying the flexibility the wage rate and the rate of return and the mobility of labor and capital. The author proves that 65 countries, 1990–2009, have almost maintained the flexibility. The author urges for the EU member countries to improve seven endogenous parameters towards sustainable endogenous equilibrium. The inflexibility and the financial crisis are results of disequilibrium. Government deficit is also a result. Nevertheless, the true cause of deficit has never been revealed in the literature. Continuous cash flow-out to bury the macro balance between demand and supply with huge money supply only remains a counter measure and definitely aggravates the circumstances in the long-run. This paper tests the existence of the flexibility, with its causes and effects and, showing basic graphs by country.

JEL: O21; O47

1. Introduction with scientific questions

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 results or short-sighted countermeasures.' True causes must be revealed in a different way of 'Scientific Revolutions,' advocated by Thomas S. Kuhn (1962, 1996). This paper concentrates on an aspect to correct answers.

This aspect is the characteristics of the wage rate and the rate of return measured in both endogenous and actual data-sets of the real assets in national accounts. Broad backgrounds of various aspects spread over the following questions:

- · Do you think that policies delete bubbles?
- · Do you think that policies delete high inflation or continuous deflation (as in Japan)?
- · Do you think that policies delete unemployment?
- · Do you think that policies delete 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 short paper starts with a definition of the endogenous equilibrium. The definition is essential to the understanding of the endogenous organic system of the 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 proved by Robinson, J. (1934) by applying the Euler's Theorem to the linear homogeneous production function (under the constant returns to scale). The author's KEWT data-sets by country and year in the endogenous equilibrium measure $MPL = w$ and $MPK = r^*$, erasing the assumptions set in the literature.

Measurement of $MPL = w$ and $MPK = r^*$ makes it immediately 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 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?[1]　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 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.　A problem is: the price-equilibrium cannot be measured.　Someone says that the price-equilibrium is measured using computer science power.　But, how does this measurement by country catch 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.

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

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1)　Samuelson, P. A.　(1957) showed a dissection of Marxian economic models, where a definite defect was traced back to imperfect competition.

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, $\alpha = \Pi/Y$, all of which are fixed in both data-sets 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 technological investment coefficient, β^* or $1 - \beta^*$, the capital-output ratio, $\Omega = K/Y$, and the diminishing returns to capital (DRC) coefficient, $\delta_0 = 1 + LN(\Omega^*)/LN(B^*)$, all of which change in both data-sets and its transitional path by year. As a result, the rate of return, $r^* = \alpha/\Omega$, one of variables are measured at once, where the growth rate of output, g_Y^*, is connected with $r^* = \alpha/\Omega$: $r^* = (\alpha/i \cdot \beta^*)\, g_Y^*$.

Returning back to $MPL = w$ and $MPK = r^*$, the marginal rate of substitution (MRS) is defined as the marginal rate of return to the marginal wage rate $\Delta(r/w) = \Delta r/\Delta w$ in equilibrium, where just for abbreviation r is used instead of r^*. The elasticity of substitutions is defined by $\sigma = \dfrac{\Delta k/k}{MRS/(r/w)} = \dfrac{(\Delta K/\Delta L)/(K/L)}{\Delta(r/w)/(r/w)}$

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 leave an incorrect expression of $\Delta MRS/MRS$ and, do not yet measure 'an optimum equilibrium' towards the maximum rate of return with the minimum net investment.

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 of the inflexibility does not guarantee

a robust sustainability of an economy. The flexibility remains one of sufficient conditions to support endogenous equilibrium. $MPL = w$ and $MPK = r^*$ are 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 hyperbola equations.

To the author's understanding, the rate of technological progress has not been measured at 'pure endogenous' in the literature, regardless of the differences between neo-classical and Keynesian. The author here interprets a rigid neo-classical methodology Meade, J. E. (1960, 1962). Robinson, J. (1961) calls his model equilibrium growth. Meade (ibid; for notations, see pp. 184–185), 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 (ibid., p. 107) 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 × the growth rate of MPK ÷ 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.

The 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." In an exchange rate aspect, 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 anxious about the relationship between the flexibility of w and r and the mobility of factors, K and L. These issues will be thoroughly discussed separately, comparing endogenous data-sets with actual statistics data by country.

Here the author must express a view on Samuelson's (1970) constancy of the capital-output ratio, in the two cases of the data-sets of KEWT and its transitional path. The endogenous system leaves one presumption that the current/initial capital-output ratio is equal to the capital-output ratio at convergence in the transitional path. In this respect, Furuta, Y. and Kamiryo, H. (*JES* 14 (Feb, 2): 61–98) present the tests of the capital-output ratio done by Furuta in the above two cases. Furuta argues that the capital-output ratio has several or a few points of peak in the transitional path. The author's presumption of $\Omega = \Omega^* = \Omega_0$ or $r = r^* = r_0$ under a fixed relative share of capital/returns may be a compromise but, this presumption contradicts the results tested by Furuta using macro-software in the transitional path. A question arises: is consistency common to recursive programming and the KEWT data-sets? To answer this question, the author revisited the endogenous model starting with *JES* 7 (Feb, 1): 51–80, 2004. The author here clarifies the

endogenous system and Furuta's (*JES* 14 (Feb): 62–80) macro tests. For the measurement of $MPL = w$ and $MPK = r$, it is, in advance, essential to simultaneously obtain the rate of return with capital stock by year, as pursued by Robinson, J. (1959): She argued that either the rate of return under an assumption of capital K or capital K under an assumption of the rate of return r is not acceptable. When r and K are simultaneously measured, endogenous equilibrium holds and its level is measured by speed years, $1/\lambda^*$, $l = (1-\alpha)n + (1-\delta_0) g_A^*$. Furuta's tests have to start with given r and K. Yet, his tests prove that the endogenous system mathematically holds.

Furthermore, policy-makers, each year, need to compare endogenous data with actual and market data. Otherwise, useful and prompt policy-decisions cannot be executed. How can the market rate, for example, 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, $r_{M(DEBT)} = r_{M(10yrs)}$ 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 equation. The relationship between the data-sets and its yearly recursive programming is consistent with each other.

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 vital interpretations to some of fundamental items, since some data are not still 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

endogenous equilibrium.

1. Minimum items (1): 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) $tax = Y_G/Y = T_{AX}/Y$ shows 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 further discuss 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, as proved by *JES* 12 (Feb, 2): 59–104,
    and that actual labor or population mobility needs another statistics.

2. Minimum items (2): Endogenous net investment to Y, $i = I/Y$, is an engine
    for 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 (3): viiii) The actual ratio of r to w, $(r/w)_{actu}$, x) the
    endogenous ratio of r to w, $(r/w)_{endo}$, and xi) $(r/w)_{actu/endo} = (r/w)_{actu}/$
    $(r/w)_{endo}$. The author's $(\Delta r/\Delta w)$ 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 data 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 find, 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.

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

shown by ten year debt yield 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.

To cover the above shortage of data for many countries, the author prepares

for the elasticity of substitution, *sigma*, using the ratio of the rate of return to the

wage rate, (*r/w*), in equilibrium. $\Delta (r/w) = (\Delta r / \Delta w)$ is called the marginal rate of

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

The *sigma* at the KEWT data-sets, 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 KEWT 5.11. For the tests, the *sigma* is able to be more

than a surrogate for the wage index.

4. Concluding remarks: Test results and implications of
the flexibility of *w* & *r*[*]

The author has seven big KEWT files for 65 countries, 1990–2009,

government and private sectors, at the Excel. The original data come from IMF

actual statistics. Related actual and endogenous data are available when asked by readers. The author briefly shows the results of the test and tries to convey good and bad policy implications with figures hereunder.

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 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.

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 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.

bop, deficit, and taxes, endogenously: the US, 1960-2009

bop, deficit, and taxes, endogenously: Japan, 1960-2009

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 $i = I/Y$ although policy-makers want to increase $i = I/Y$. 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.

net investments, actual vs endogenous: the US, 1960-2009

net investments, actual vs endogenous: Japan, 1960-2009

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 endowed with the qualitative net investment coefficient, $beta^*$, the capital-output ratio, Ω, and $delta_0$, in equilibrium.[2] $(r/w)_{actu}$, $(r/w)_{endo}$, 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 *IFSY*, IMF. To the 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.

the rate of return and the wage rate, actual vs endogenous: the US, 1960-2009

the rate of return and the wage rate, actual vs endogenous: Japan, 1990-2009

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

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2) This is shown by 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 is thoroughly discussed using 16 poor/developing countries in the world at the *WEAI* Conference, San Diego on 1st of July, 2011.

endogenous valuation value of the real assets remains unchanged soon after

bubbles and deficit is not used for that balance.

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 $g_{w\ actu/endo}$, obtained from the actual wage index. And,

$g_{w\ actu/endo}$ is tightly related to the relative net investment level, $i_{actu/endo}$. If

$i_{actu/endo}$ passes a difficult period(s), $g_{w\ actu/endo}$ 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 $g_{w\ actu/endo}$ with the relative wage rate, $w_{actu/endo}$. Its

$g_{w\ actu/endo}$ fluctuates by year to support the endogenous system but

$w_{actu/endo}$ 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 $g_{w\ actu/endo}$ follows $w_{actu/endo}$, as a central base. These imply wages are flexible by nature.

the wage rate, actual vs endogenous: the US, 1960-2009

the wage rate, actual vs endogenous: Japan, 1960-2009

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

the wage rate and the rate of return, actual vs endogenous: the US, 1960-2009

the wage rate and the rate of return, actual vs endogenous: Japan, 1990-2009

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 points out that even the EU member countries are rather stable almost two decades before 2008. This fact is exposed using figures by member country. For simplicity, the author does not refer to the exchange rate in this paper; the exchange rate leads to another problem as discussed by Mundell, R. (1961). This problem will be discussed at *Forum for Economists International*,

Amsterdam, 24–25 Sep, 2011, together with colleagues interested in this
problem, using KEWT 5.11–2 and –3 and starting with the flexibility of
wages and returns, as proved by this paper.

Contents of figures for the cause and effect relationships between the BOP & budgetary deficit and endogenous equilibrium

For notations, see '4. Concluding remarks' in the text.

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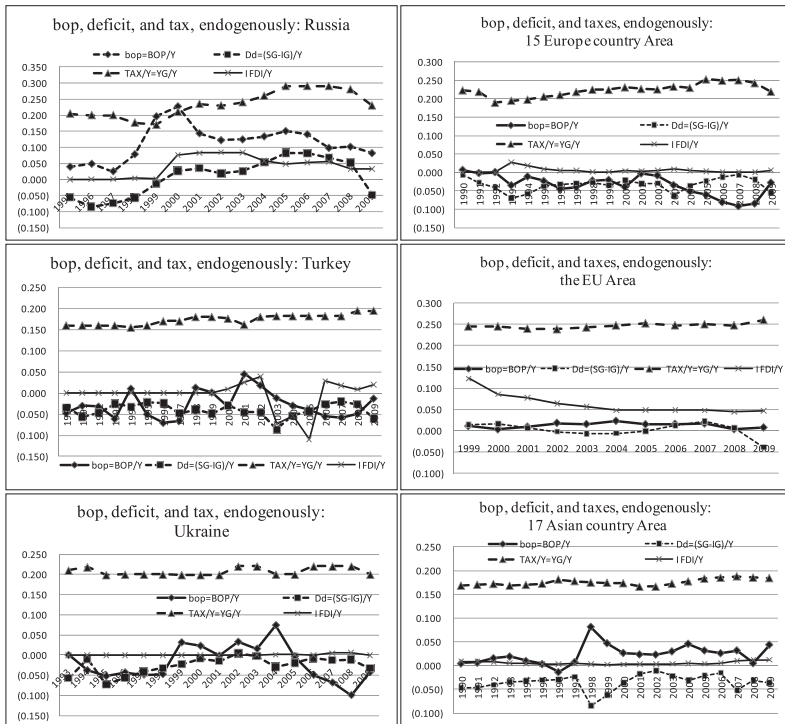are *International Financial Statistics Yearbook*, IMF

**Figure A1   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 *International Financial Statistics Yearbook*, IMF

**Figure A2   Actual versus endogenous for net investment and wage rate flexibility:
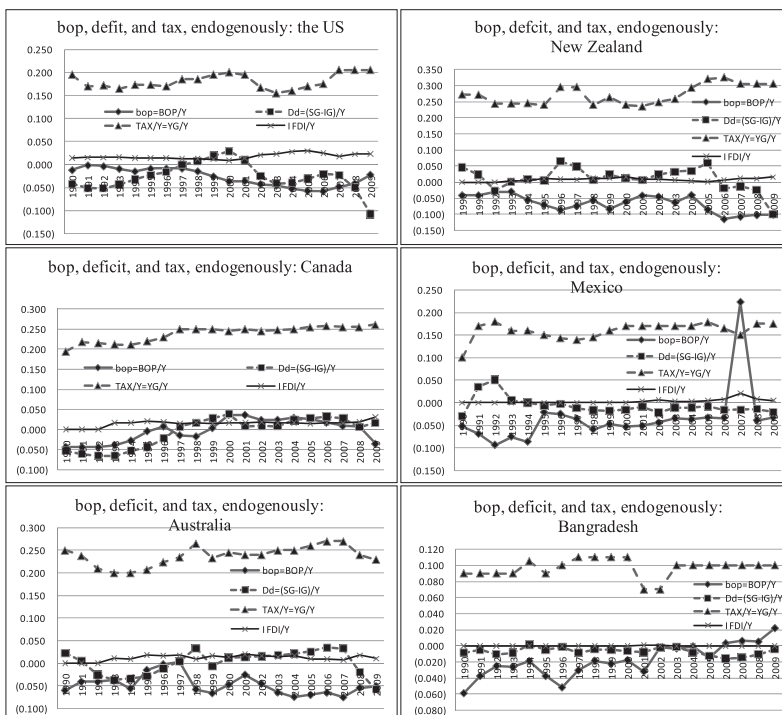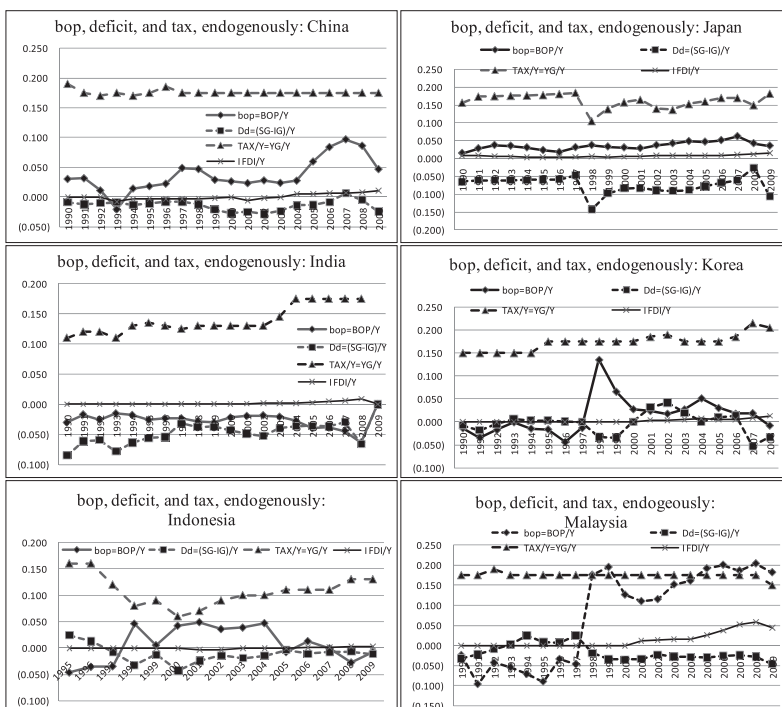by Area using weighted averages**

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

Figure B1   Actual versus endogenous for net investment and wage rate flexibility: by country at 14 country EU Area

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

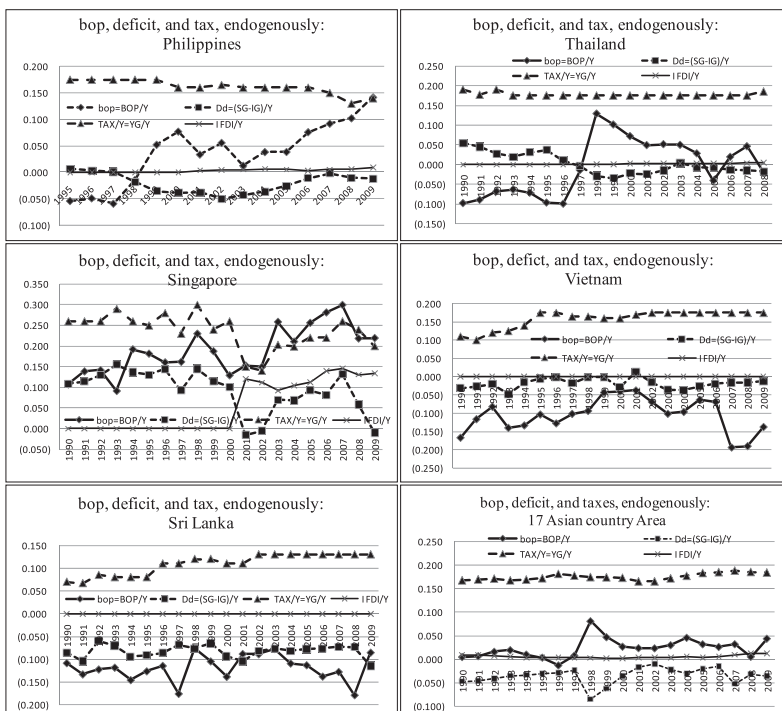**Figure B2   Actual versus endogenous for net investment and wage rate flexibility: by country at 14 country EU Area**

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

**Figure B3   Actual versus endogenous for net investment and wage rate flexibility:
by country at 14 country EU Area**

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

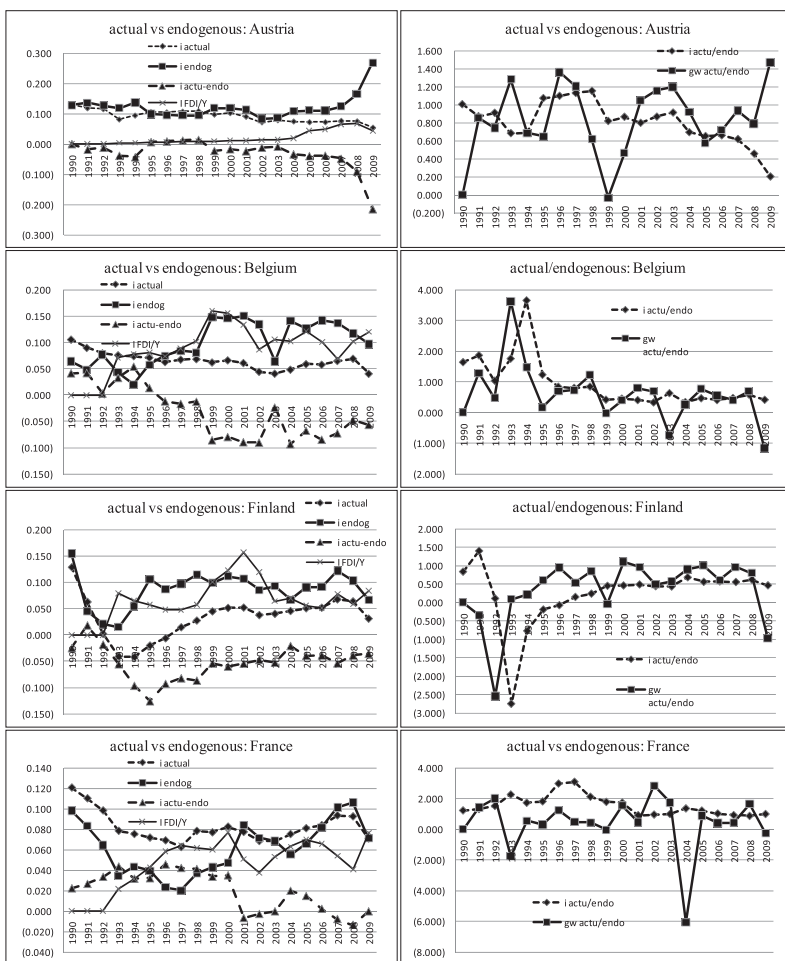**Figure B4 Actual versus endogenous for net investment and wage rate flexibility: by country at 15 country Europe Area**

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

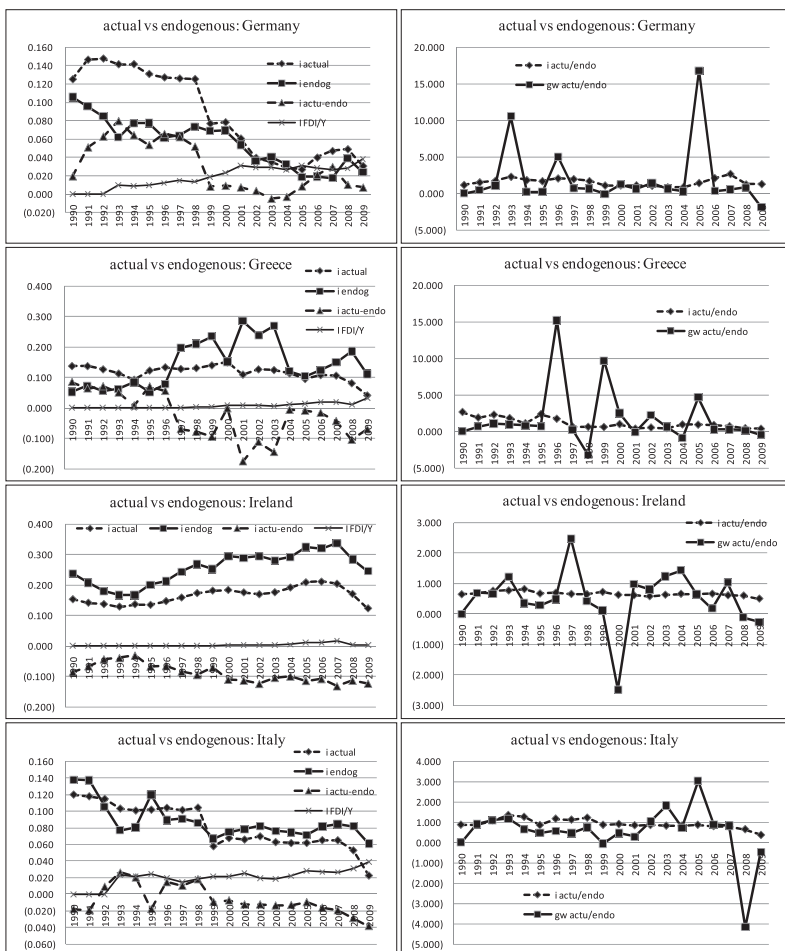**Figure B5   Actual versus endogenous for net investment and wage rate flexibility: by country at 15 country Europe Area**

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

Figure B6   Actual versus endogenous for net investment and wage rate flexibility: by country at 15 country Europe Area
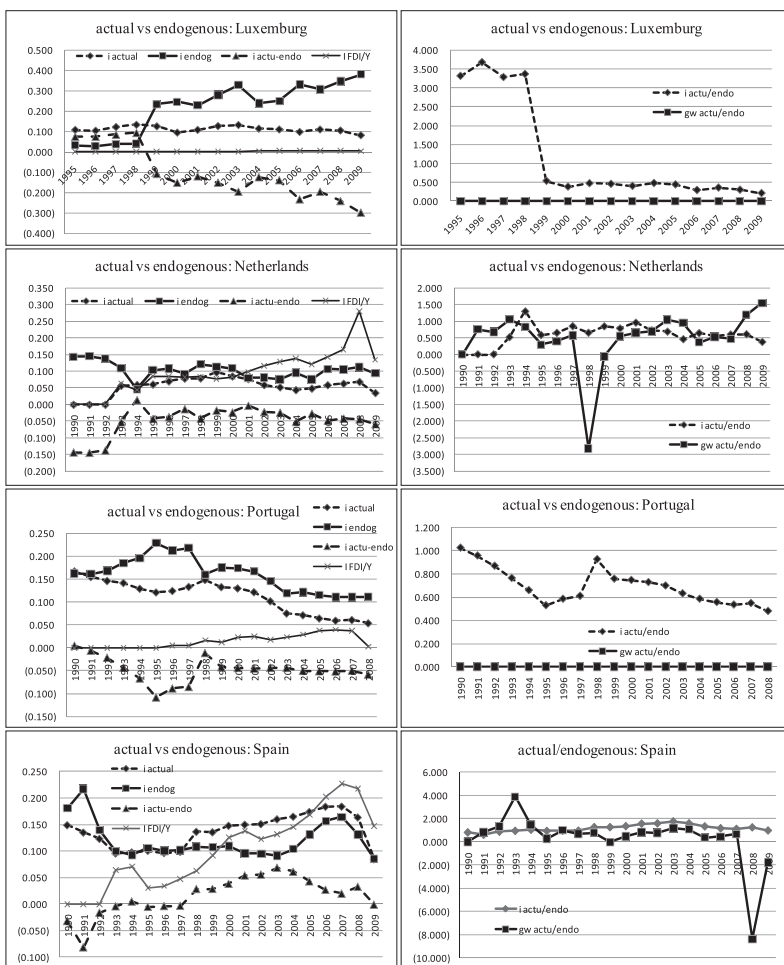
Data source: KEWT 5.11–3 by sector, 1990–2009, whose original data are *International Financial Statistics Yearbook*, IMF

Figure B7 Actual versus endogenous for net investment and wage rate flexibility: by country at 15 country Europe Area

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

Figure B8　Actual versus endogenous for net investment and wage rate flexibility: by country at 17 country Pacific and Asia Area
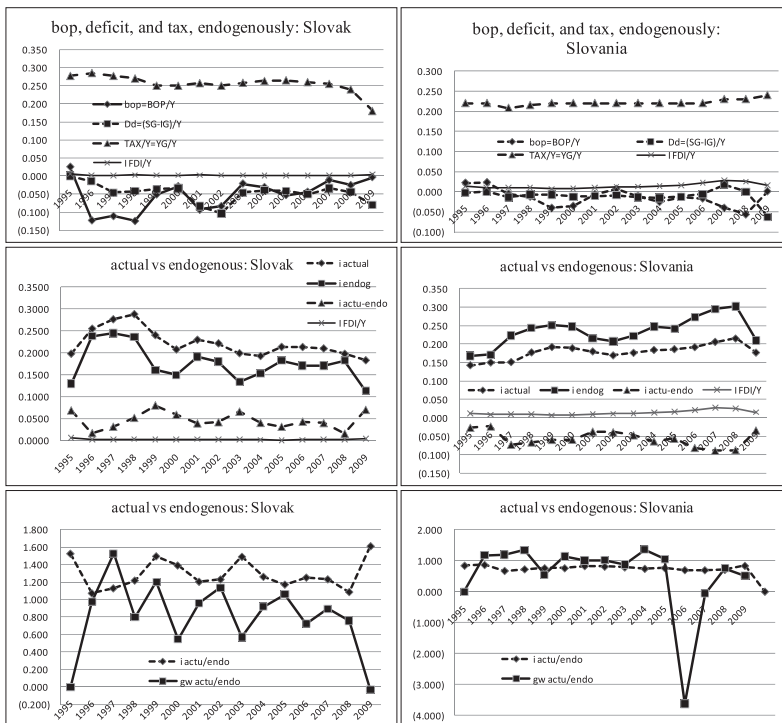
Data source: KEWT 5.11−1 by sector, 1990−2009, whose original data are *International Financial Statistics Yearbook*, IMF

Figure B9 Actual versus endogenous for net investment and wage rate flexibility: by country at 17 country Pacific and Asia Area
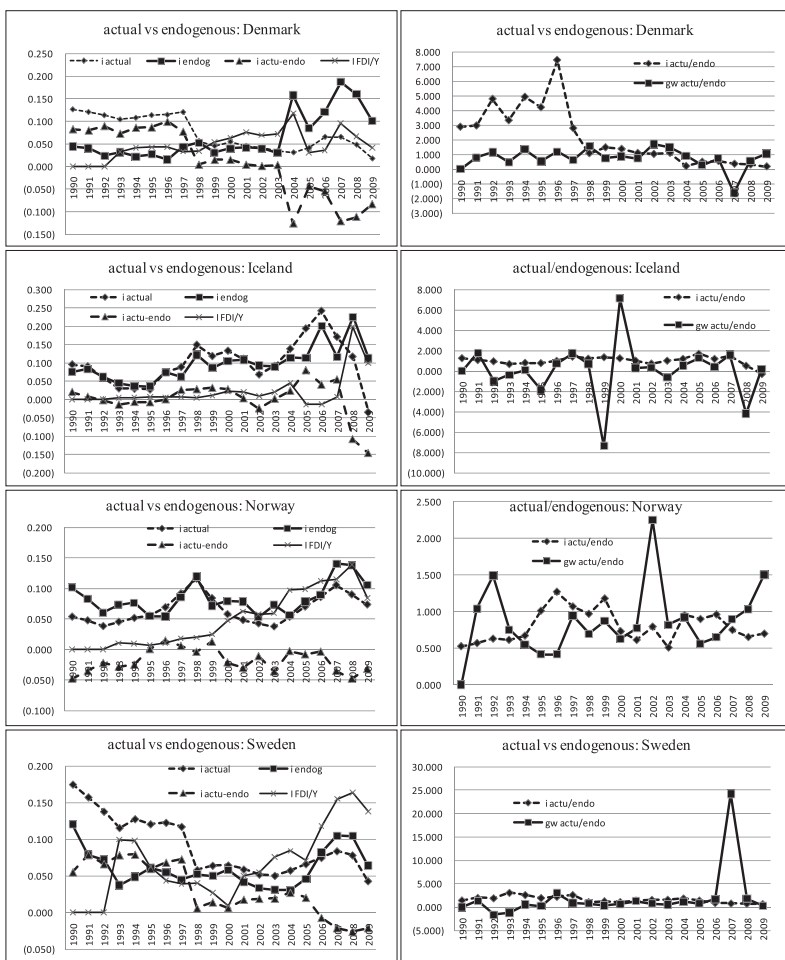
Data source: KEWT 5.11−1 by sector, 1990−2009, whose original data are *International Financial Statistics Yearbook*, IMF

Figure B10   Actual versus endogenous for net investment and wage rate flexibility: by country at 17 country Pacific and Asia Area

**Figure RW1   Actual versus endogenous for net investment and wage rate flexibility:
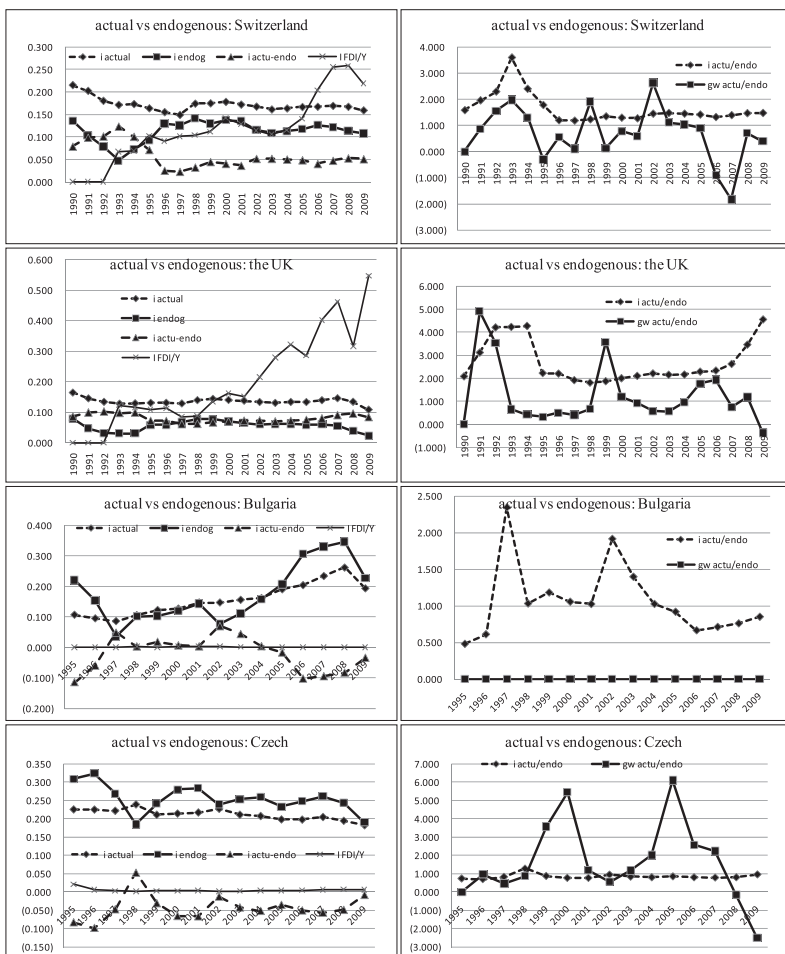by country at 14 country EU Area**

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

Figure RW2　Actual versus endogenous for net investment and wage rate flexibility: by country at 14 country EU Area

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

Figure RW3   Actual versus endogenous for net investment and wage rate flexibility: by country at 14 country EU Area
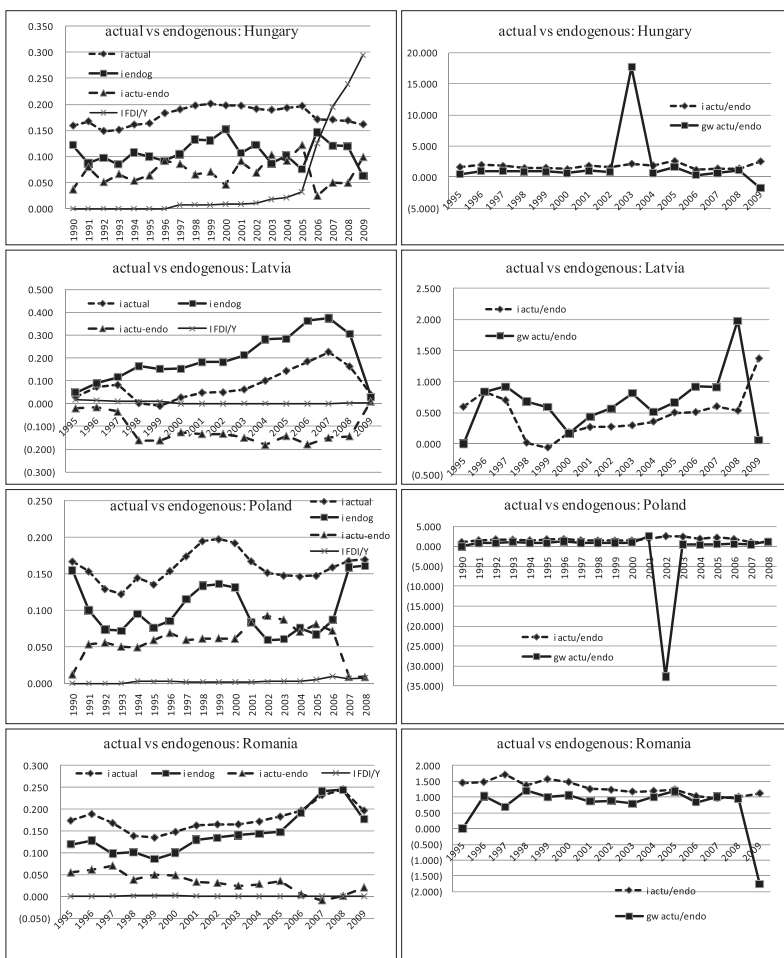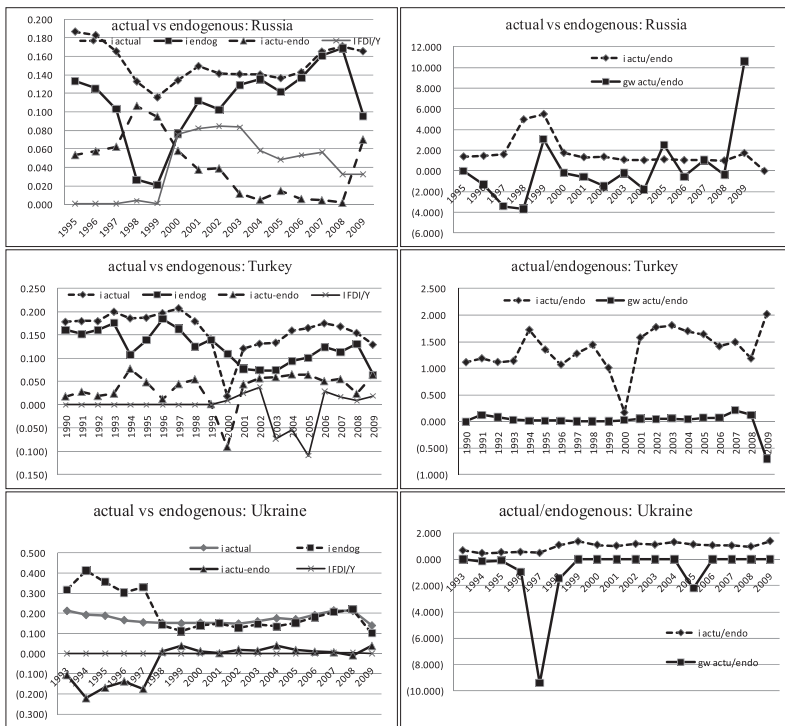
Data source: KEWT 5.11–2 by sector, 1990–2009, whose original data are *International Financial Statistics Yearbook*, IMF

Figure RW4   Actual versus endogenous for net investment and wage rate flexibility: by country at 14 country EU Area

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

Figure RW5   Actual versus endogenous for net investment and wage rate flexibility: by country at 15 country Europe Area

Data source: KEWT 5.11–3 by sector, 1990–2009, whose original data are *International Financial Statistics Yearbook*, IMF
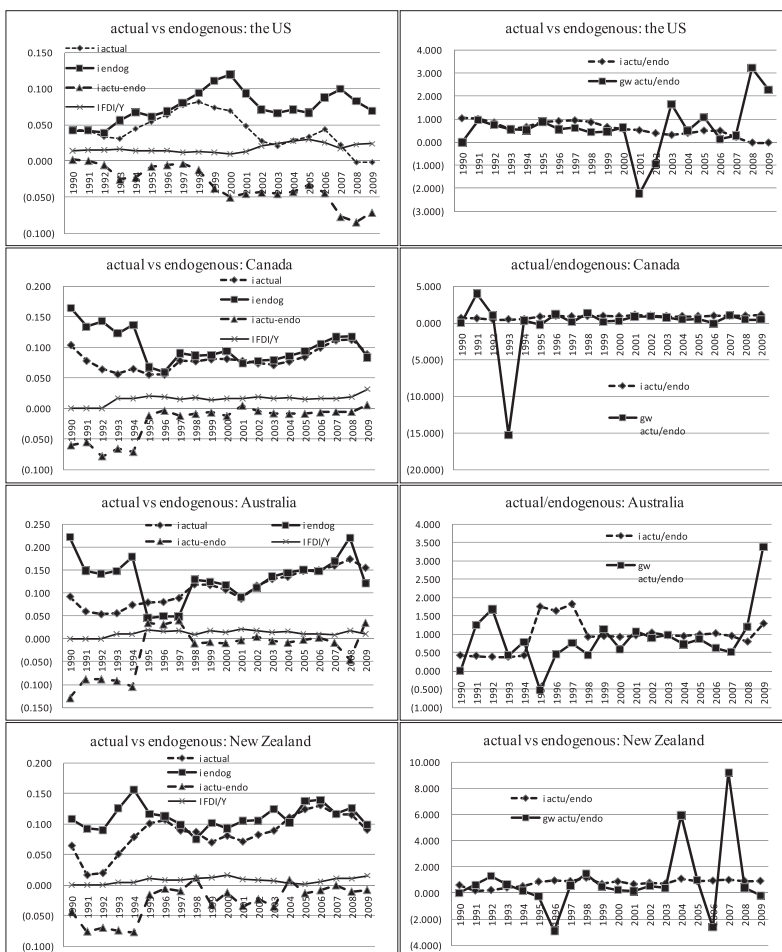
Figure RW6   Actual versus endogenous for net investment and wage rate flexibility: by country at 15 country Europe Area

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

**Figure RW7　Actual versus endogenous for net investment and wage rate flexibility:
by country at 15 country Europe Area**

Data source: KEWT 5.11–3 by sector, 1990–2009, whose original data are *International Financial Statistics Yearbook*, IMF
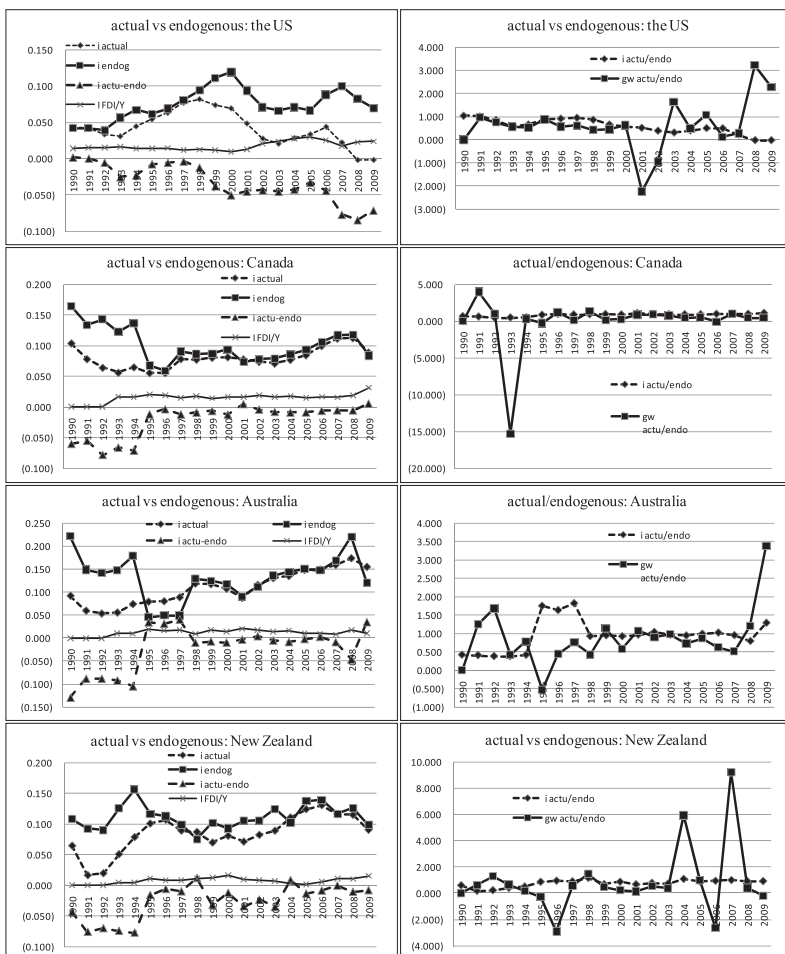
Figure RW8　Actual versus endogenous for net investment and wage rate flexibility: by country at 15 country Europe Area

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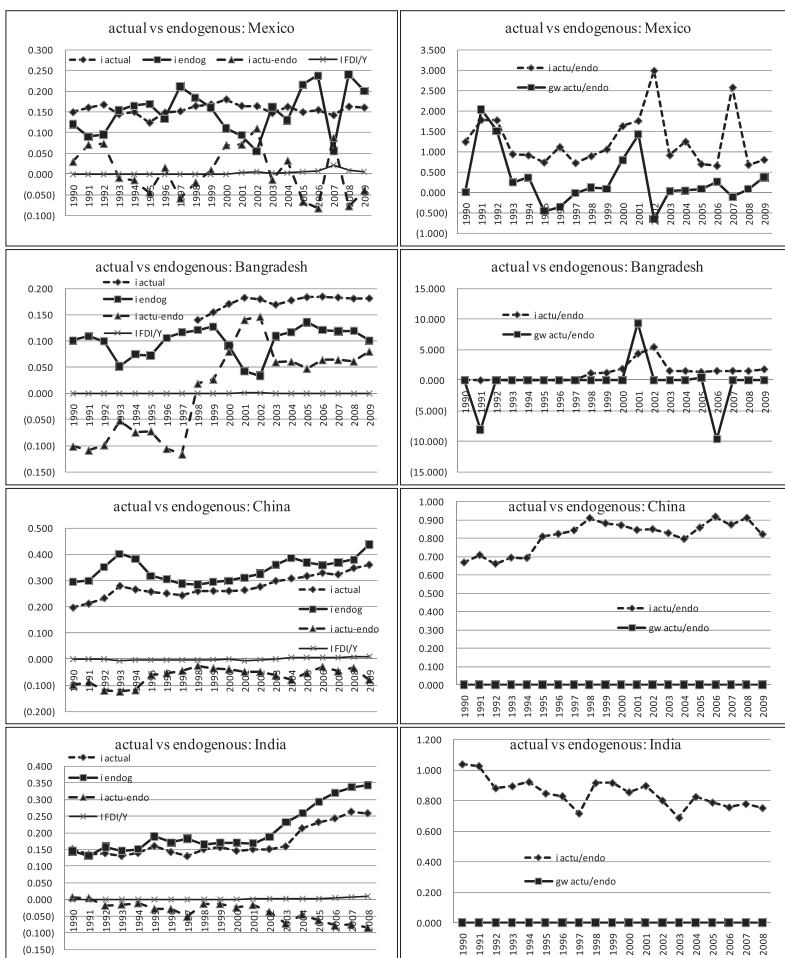Financial Statistics Yearbook*, IMF

**Figure RW9   Actual versus endogenous for net investment and wage rate flexibility:
by country at 17 country Pacific and Asia Area**

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

Figure RW10   Actual versus endogenous for net investment and wage rate flexibility: by country at 17 country Pacific and Asia Area

Data source: KEWT 5.11–1 by sector, 1990–2009, whose original data are *International Financial Statistics Yearbook*, IMF
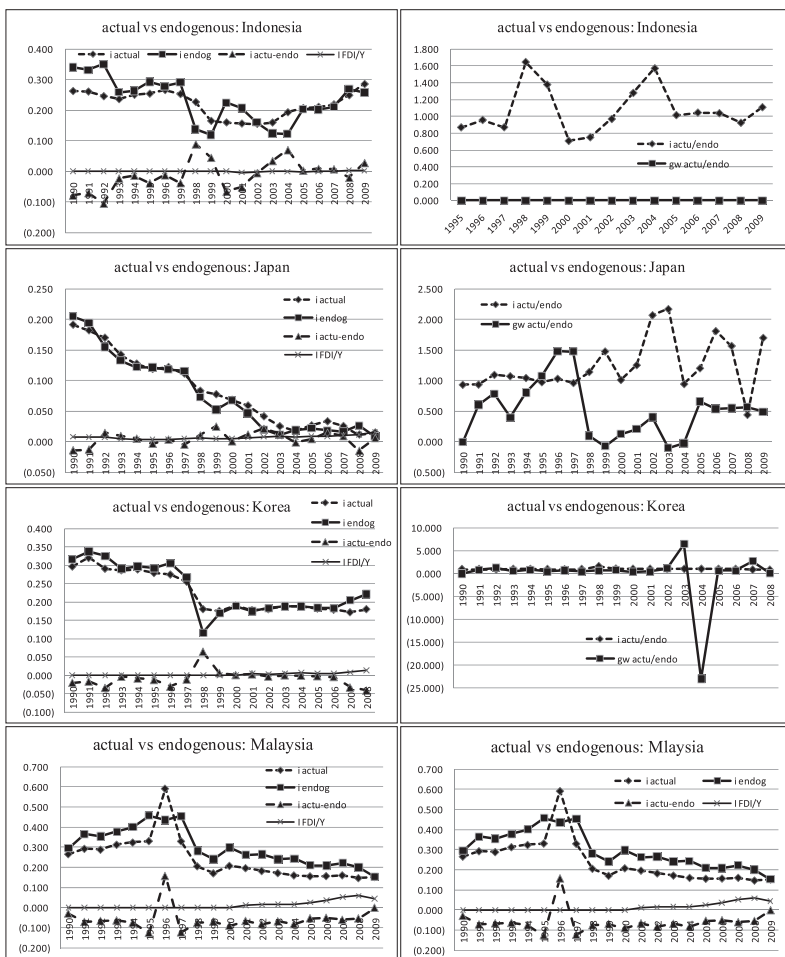
Figure RW11   Actual versus endogenous for net investment and wage rate flexibility: by country at 17 country Pacific and Asia Area

Data source: KEWT 5.11–1 by sector, 1990–2009, whose original data are *International Financial Statistics Yearbook*, IMF
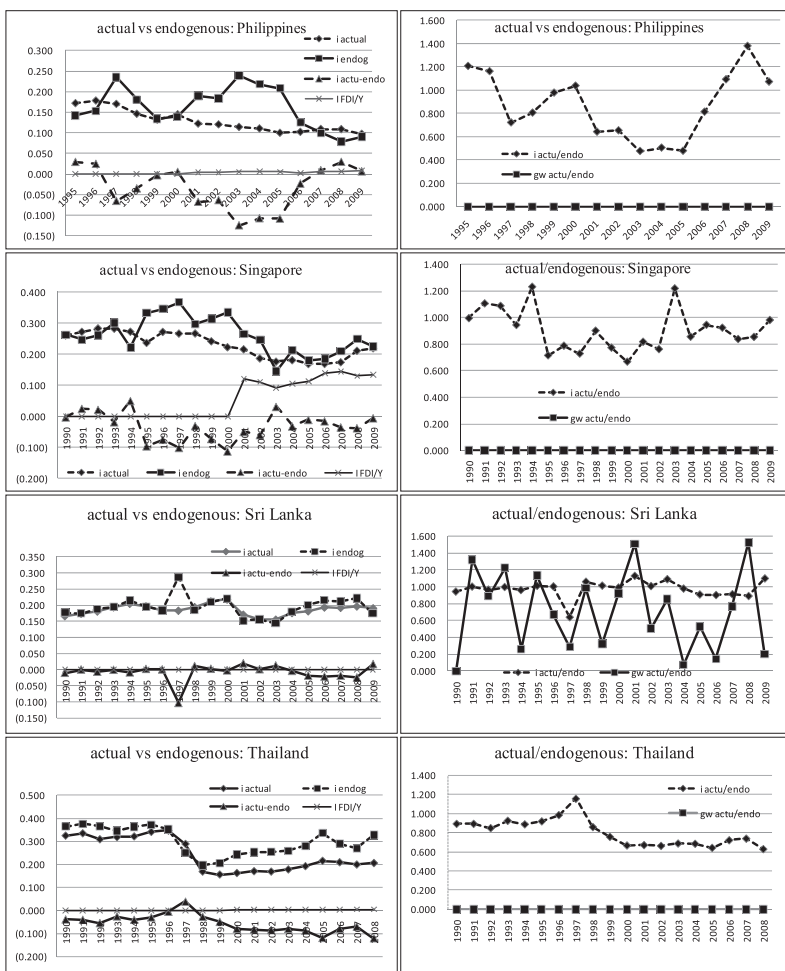
Figure RW12   Actual versus endogenous for net investment and wage rate flexibility: by country at 17 country Pacific and Asia Area

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

**Figure RW13   Actual versus endogenous for net investment and wage rate flexibility:
by country at 17 country Pacific and Asia Area**

References

Hanson, Norwood Russell. (1958). Patterns of Discovery. Cambridge: Cambridge University Press. 233p.

Kuhn, Thomas, S. (1962, 1970). The Structure of Scientific Revolutions (3rd. Ed., 1996, 212p.). Chicago: The University of Chicago Press. 219p. (originally, Die Structur wissenschaftlicher Revolutionen. Frankfurt: Suhrkamp Taschenbuch Verlag. 239p.).

Lucas Robert, E., "Economic Policy Evaluation: A Critique," pp. 19–46, in: "Brunner Karl, and Allan H., Meltzer, "*The Phillips Curve and Labor Market*," North-Holland, 1976.

Meade, J. E. (1957). The Balance-of-payments Problems of A European Free-Trade Area. *The Economic Journal* (Sep): 379–396.

Meade, J. E. (1962, Revised). *A Neo-Classical Theory of Economic Growth.* London: Unwin University Books. 185p. (1st Ed., 1960, 146p.).

Mundell, Robert, A. (1960). The Pure Theory of International Trade. *American Economic Review* 50 (March, 1): 67–110.

Mundell, Robert, A. (1960). The Monetary Dynamics of International Adjustment under Fixed and Flexible Exchange Rates. *Quarterly Journal of Economics* 74 (May, 2): 227–257.

Mundell, Robert, A. (1961). The International Disequilibrium System. *Kyklos* Band 14 (2): 153–170.

Mundell, Robert, A. (1961). A Theory of Optimum Currency Area. *American Economic Review* 51 (Sep, 4): 657–665.

Robinson, Joan. (1934). Euler's Theorem and the Problem of Distribution. *The Economic Journal* (Sep): 398–414.

Robinson, Joan. (1959). Some Problems of Definition and Measurement of Capital, *Oxford Economic Papers* 11 (June, 2): 157–166.

Robinson, Joan. (1961). Equilibrium Growth Models. *American Economic Review* 51 (June, 3): 360–369.

Samuelson, Paul, A. (1957). Wages and Interst: A Modern Dissection of Marxian Economic Models. *American Economic Review* 47 (Dec, 6): 884–912.

Samuelson, Paul, A., and Solow, Robert, M. (1960). Problem of Achieving and Maintaining a Stable Price level: Analytical Aspects of Anti-Inflation Policy. *American Economic Review* 50 (May, 2): 177–194.

Samuelson, Paul, A. (1970). Law of the Conservation of the Capital-**O**utput **R**atio, Proceedings of the National Academy of Sciences. *Applied Mathematical Science*

67: 1477–1479.

Seife, Charles. (2006). *Decoding the Universe* (*How the New Science of Information is Explaining Everything in the Cosmos, from Our Brains to Black Holes*). London: Penguin Books, 296p.

Sung Won Sohn. (2011). Which Country Should Leave the Euro? International Atlantic Economic Conference, Athens, March 18, 2011, 18p.

For Kamiryo Hideyuki, see http://www.riee.tv http://www.megaegg.ne.jp/~kamiryo/

For the author's papers after 1980, enter Hideyuki Kamiryo at National Institute of Informatics, Scholarly and Academic Information Navigator: http://ci.nii.ac.jp/